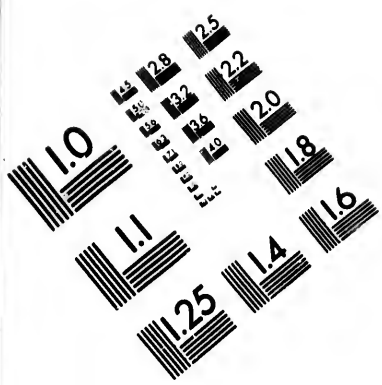

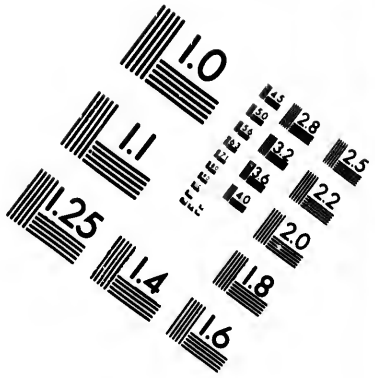

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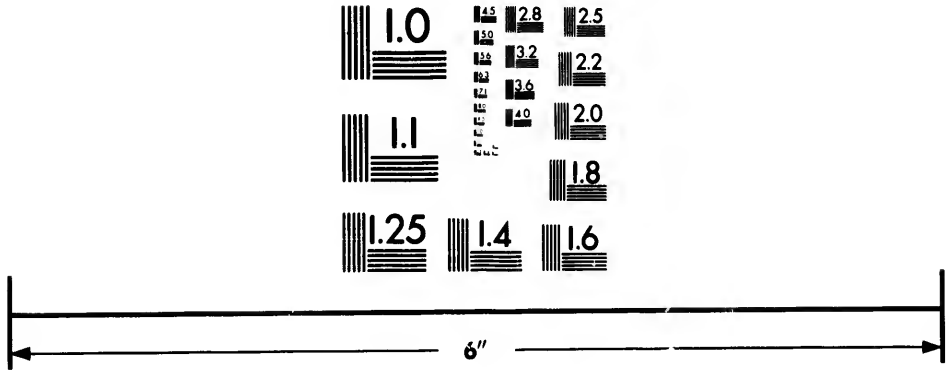

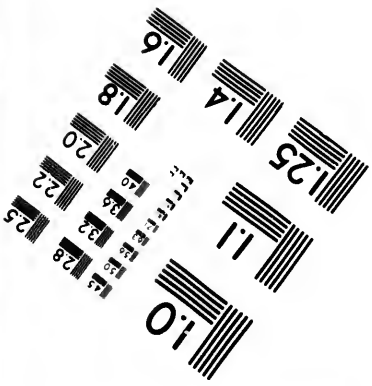

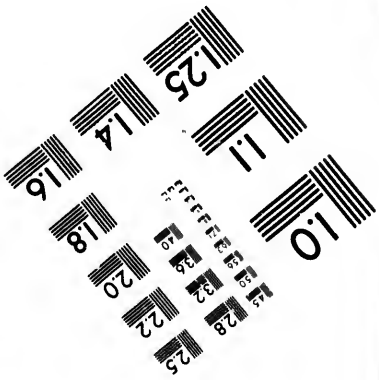

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CHAMBERS'S

INFORMATION FOR THE PEOPLE.

A POPULAR ENCYCLOPÆDIA.

FIFTEENTH AMERICAN EDITION.

WITH

NUMEROUS ADDITIONS AND MORE THAN FIVE HUNDRED ENGRAVINGS.

VOL. II.

PHILADELPHIA:
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NO. 610 CHESTNUT STREET.
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CONTENTS.

CHAMBERS'S

INFORMATION FOR THE PEOPLE.

HEATING, VENTILATION, LIGHTING.

Upon judicious means of heating, ventilating, and lighting apartments, manufactories, and several classes of public buildings, very important consequences depend, including not only the ordinary comfort, but the health of human beings. We propose here to treat the three subjects (with the addition of the kindred use of smoke-consumption) in one paper, but to confine our attention chiefly to plans involving scientific principle, as well as ingenious mechanical contrivance.

HEATING

It is scarcely necessary to remark, that the mode of heating apartments most prevalent is by a fire of coal placed in a grate, having a chimney above, through which the vaporized products of the fuel are carried off. Of one class of results from this mode there can be no doubt. The fire, sparkling or glowing in its appropriate receptacle, has an air of cheerfulness and comfort which strikes every beholder, causing the domestic group to cluster around it with that feeling of satisfaction which makes an Englishman regard his fireside as among the most precious things connected with his existence. But while the common open fire is almost an object of worship among us on account of its pleasant look and power of concentrating the whole family in one social circle, it is not unattended with certain drawbacks, difficulties, and disadvantages; nor can it be applied well in any place besides an ordinary apartment. The greatest drawback is the uneconomical use which it makes of fuel. About one-half of the heat produced by a common fire ascends with the smoke. The smoke itself is an unconsumed part of the fuel. Finally, about a fourth of the heat which is radiated into the apartment is, in ordinary circumstances, carried into the chimney between the fire and the mantel-piece, and thus lost. It is calculated by Dr. Arnott that only about one-eighth part of the heat-producing power of the fuel used in common fires is realized, all the rest being dissipated into the surrounding atmosphere. Count Rumford gave even a more unfavourable calculation, making the dissipated or lost part to be no less than fourteen-fifteenths. He probably over-estimated the loss considerably; but that a very large portion of the power of fuel is forfeited in the use of common chimneys, is just as certain as it is that an open fire is an object which every eye delights to rest upon. Dr. Arnott's estimate is probably not much, if at all, above the truth. It is also unquestionable that often a common fire is found to give a partial kind of warmth, heating the side of our persons next to it, but leaving the rest cold; that it also produces draughts into our rooms which are any thing but safe or agreeable; that often one active fire deranges the action of the chimneys of other fires, and fills the house with smoke; that smoke and dust are annoyances more or less inseparable from it in all its shapes; and that it is by no means a mode of heating free from danger to both property and person. These are disadvantages of which every one is aware; and although they are not sufficient to extinguish the pleasure which we take in our sea-coal fires, they may certainly be allowed to furnish reason for inquiring if, by any modification of present plans, fuel could be applied more economically, and at the same time agreeably. There is also, we must recollect, the necessity for modes of heating applicable to public buildings, where the common fire is of little service.

WARMING BY HIGHLY HEATED SURFACES.

One of the first attempts to arrive at a mode of warming more economical than the common fire, and applicable to large buildings, suggested the raising of plates of iron to a high temperature, and causing air to pass over them on its way to supply the rooms or halls where it was required. In some part of the building a furnace was employed to heat the plates, which were of cast iron, and the air, after passing over them, was sent forward through a tunnel, and ushered into the hall or other place required to be heated, either through a grated aperture in the floor, or by pipes distributed round the walls or galleries. This mode was introduced into many churches in the early part of the present century, and it was fully tried in the London Custom-house. In the latter building there are several large rooms, in which a great number of clerks and other officers are assembled for business. Into one, called the Examiners' Room, the air rushed at a temperature of 170 degrees, to be reduced to a more moderate heat by its mixing with the air already in the apartment. In another called the Long Room, the air entered at a temperature varying from 90 to 170 degrees, being liable to be reduced by a regulated admission of cold air into the apartment from without. It is not easy to excuse the ignorance which dictated this mode of heating. When air passes over plates raised to red heat, as these were, it is desiccated, or deprived of its natural mu-

midity; animal and other matters floating in it are decomposed, it is charged with sulphurous fumes from the iron; and lastly, by the drying or desiccation, it is thrown into a state highly electric. The condition of the air is then nearly the same with that which African travellers recognised with terror under the name of the simoom. The consequence in the Custom-house was a general falling off in the health of the officers, which became at length so alarming, that that mode of warming the apartments had to be given up.

The mode of warming by highly-heated surfaces is now generally condemned on account of its deleterious effects on the air; but it is still in practice to some extent, and we have therefore thought ourselves called upon to introduce a brief description of it, in order to have an opportunity of explaining its unsuitableness, and warning against its use. It may be safely set down as a first principle in the science of heating, that no mode which materially alters the chemical character of the air can be compatible with health. Common stoves are liable to this objection in greater or less measure, and are therefore rarely used excepting in lobbies.

WARMING BY MODERATELY HEATED SURFACES.

The objections to the above mode of heating would obviously be in a great measure overcome, if, instead of a small surface highly heated, a large one moderately heated were used. This may be done in various ways, as—1. By a furnace operating upon the heat-giving surface; 2. By steam in tubes; or 3. By hot water also in tubes.

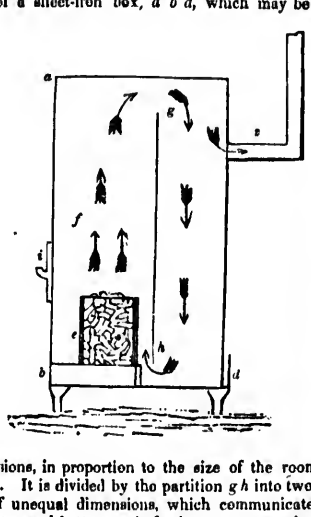
Surfaces Heated by Internal Furnaces—Strutt's and Arnott's Stoves.

The first attempt of which we are aware to give warmth by hot air from large moderately heated surfaces, was made by Mr. William Strutt, of Derby, in 1792. The cotton-mill of the copartnery to which he belonged was in that year fitted up with a stove constructed upon this principle; and the same plan, after being tried in his own house and those of his friends, was introduced, with all the improvements of which it was deemed capable, into the Derby Infirmary in 1807. It has since been copied in various public and private buildings.

Shortly, and dismissing unimportant details, the Strutt-stove consists of a *cockle*, or plate-iron box, of about two feet in height by one in breadth of sides, inverted with the open mouth downwards over a small close furnace, which heats it about 280 degrees. Another somewhat larger box surmounts this, leaving the space of an inch or so between. This outer box is perforated with numerous holes, into which short open tubes are fitted, projecting outwards. This apparatus being constructed in a small close room, a channel or culvert of considerable width is made to communicate between that room and the open air on the outside of the house. On the fire being kindled in the furnace, the cockle is heated to the desired height, and no more, a control being exercised over the fire by a valve for communicating air to the furnace. The air immediately without the cockle is warmed, and, by virtue of its increased temperature, begins to ascend. To replace it, fresh air is drawn in through the culvert, and through the numerous tubular apertures of the outer case, and made to rush against the heated vessel within. This air is accordingly heated too, and pursues the same line of ascent. Thus there is a constant flow of moderately heated air upwards. This may either be allowed to pass into an open hall, staircase, or any other single space which it is desired to warm, or it may be carried along in flues and distributed into different rooms. It will be observed that the instrument or medium for warmth in this case is a stream of heated air: the temperature desired for it is about 64 degrees, and it is kept at this low point by the spaciousness of the culvert. In the house of Sir John Robinson, Randolph Crescent, Edinburgh, fitted up on this plan, there are two culverts giving a total area of fourteen square feet. The constant rushing of so large a volume of air into the house implies a necessity for some flues or apertures to carry it off after it has served its purposes. The collective areas of these flues or apertures ought to be the same as those of the cold air passages or culverts. In the stove used in the Derby Infirmary, it was found that one pound of coal raised 20,000 pounds of air through one degree of temperature.*

The Arnott stove is upon the same principle of an extensive and moderately warm heating surface, but it has as yet been only constructed in a portable form. Dr. Arnott was gradually led to the adoption of this mode of warming. He had got a large box of hot water fitted up in his study, which gave the requisite temperature; but the hot water being supplied by a pipe from the kitchen fire below, some inconveniences were experienced, which suggested to him the fitting up of what has been called a water-clad stove, namely, an ordinary room stove, surrounded by a close outer case containing water, which the fire within maintained at boiling heat. From this it was but a step to the adoption of a similar large case, to be maintained at about the temperature of boiling water by a small and regulated fire within. Such is the Arnott stove.

The learned inventor has described several modifications of his stove,† and it has been copied in many various ways, generally with little regard to the original principle. We shall select for description one simple form, which seems to have been the first exemplified by Dr Arnott, and in which the fundamental principle seems to be as well brought out as in any other. This stove consists of a sheet-iron box, *a b d*, which may be of any



dimensions, in proportion to the size of the room to be heated. It is divided by the partition *g h* into two chambers of unequal dimensions, which communicate freely at the top and bottom. A fire-box, *e*, composed of iron lined with fire-brick, rests at the bottom of the larger chamber. Access is obtained to it, for the purpose of supplying fuel, by the door *i*, which must fit closely. The refuse of the fire falls into an ash-pit, the door of which is at *b*. Here, also, is a valve for the supply of air to the fire-box. The fumes and heat of the fire pass in the direction indicated by the arrows, giving warmth to the outer case. The smoke finally passes off, by the

* Sylvester's Philosophy of Domestic Economy, &c., 1819.

† Dr. Arnott on Warming and Ventilating, 1838.

flue *c*, into an adjoining chimney. The aim of the inventor was to heat an extensive surface to about 200 degrees Fahrenheit, so as to diffuse a moderate warmth into a room. He attains the power of keeping the heat at this height by the valve for admitting air. When this is opened widely, a large stream of air enters, and combustion becomes active. When, on the contrary, the aperture is reduced, a comparatively small stream is admitted, and combustion languishes. The temperature of the outer case is raised or depressed accordingly. By the revolution of the heat and smoke round the division of chambers, their power of giving forth warmth is expended as far as possible on the plates of the outer case, so as to be serviceable for the end in view; and it might be possible to exhaust the whole for that end by lengthening the flue, or causing a great extent of it to pass through the air of the room before entering the chimney. The Arnott stove certainly makes the most economical use of fuel of any species of contrivance for producing artificial heat as yet known. Six pounds of Welsh coal or coke, of the value of one penny, will serve an ordinary one for a whole day.

The Arnott stove is capable of something nearly approaching to self-regulation. When it was invented, about 1834, there was in existence a well-known means of adjusting the temperature of bakers' ovens by a self-acting thermometer. Though an old expedient, some person had recently secured a patent upon it, and Dr. Arnott was therefore unable to take advantage of it for his stove. There are, however, many modes of producing the same curious mechanical results, and a few of these he specifies. That which he has employed in the stoves made under his own care, consists of a glass tube inserted horizontally into the upper part of the heated chamber of his stove, with a downward bend on the out side. Mercury is put into the bend of this tube, leaving the part which is within the stove empty of all but common air. This air, of course, expands in proportion to the heat of the stove, and in doing so presses upon the mercury in that part of the outer bend next to it. The mercury in the other part of the bent tube accordingly rises. A float on its surface is thus raised. Connected with the float is a wire, which acts upon a valve at the door of the fire-box, causing it to open and shut according as the float falls or rises. By such simple means, the least increase of heat within immediately and unavoidably brings about a diminution of the supply of air to the fire, which therefore instantly begins to burn less intensely. So, also, any decrease of heat instantly produces a larger supply of air, by which the fire is, as it were, *poked*, and begins to burn more brightly. The cooling from a fresh supply of coke must of course cause that increased supply of oxygen which is necessary to make the new materials glow; and the new and great heat thus brought about must immediately check itself by the closing of the valve. It is also obvious, that when the materials are nearly burnt down, and the supply of air thus increased, the only consequence is, that the air rushes in as long as there is any thing to burn, and no longer.

The express advantages of the thermometer stove are enumerated by the learned inventor under fourteen heads, which we shall abridge. 1. Economy of fuel. While in the case of a common open fire, seven-eighths of the heat goes up the chimney, nearly the whole heat is secured by the stove. A gentleman known to us saw Dr. Arnott put a few leaves of a pamphlet into his fire-box, the ignition of which immediately heated the whole stove, and diffused an agreeable warmth throughout the room. An ordinary room can be kept warm by the stove for twenty-four hours, at the expense of one penny in coke or anthracite. 2. The temperature diffused by the stove is uniform throughout the room. 3. The stove is always alight, to the saving of much of that inconvenience and loss of time occasioned by the going out and kindling of ordinary fires. 4. No smoke, of the character of the smoke of a common fire, arises from the stove, but only a slight stream of volatile gases. 5. No dust is diffused throughout the room. 6. The dangers to which children, old people, and others, are exposed from a common fire, are obviated. 7. The danger to property is as little as the danger to persons. 8. The stove is obedient to command, and could be managed by a child. 9. It can be established at little expense. 10. It saves all expense for attendance. 11. It is easily moved. 12. It may be fashioned into any graceful or convenient form, so as to ornament a room. Dr. Arnott mentions that it may be in the form of a statue. 13. A drawer inserted into the heated chamber of the stove would serve for cooking meat, and a pot for boiling might be placed upon the fire-box; it is therefore, as Dr. Arnott remarks, peculiarly the *poor man's* stove. 14. No sweeping-boys are required.

Under a sense of professional honour, Dr. Arnott did not take out a patent for his stove. Regarding it as an invention for the improvement of health, he presented it to the world, as he had previously done his hydrostatic bed. It was therefore made by many furnishing ironmongers in the metropolis and elsewhere, some of whom took out patents for what they considered as improvements upon it. Though the intention of the inventor was good, his liberality has had a bad result. The principle, simple as it appears, was not well understood. The stoves made by all, except a very few ironmongers, were constructed erroneously, the prevalent fault being a diminution of the heating surface in proportion to the strength of the furnace. It is a curious fact in science, well worthy of being noticed, that twelve patents were taken out in one year for modifications of the Arnott stove, *all of which Dr. Arnott considered to be upon false principles.* The consequence has been, that many Arnott stoves, which had been introduced into houses with a good hope of their acting beneficially, have been given up on account of the inconvenience felt from the species of heat which they generated. It is also, however, to be observed that the stove, made even upon the most approved principles, would require certain adjuncts and conditions in order to operate agreeably.

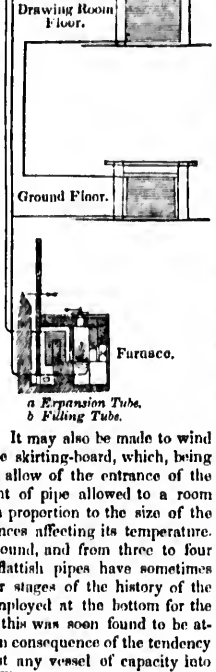
All metal surfaces, however well the principle of a large superficies moderately warmed may be observed, raise the temperature by two means, namely, by radiation and by conduction. Radiated heat, which is that given by a common fire, is perfectly safe; but the heat produced by the air coming in contact with a warmed surface is more or less deteriorated. The air, which forms the instrument or medium for heating the rest, has been altered in its character, particularly in being desiccated, or deprived of its humidity. It is necessary to counteract this result by an artificial infusion of humidity into the atmosphere. This may be done in various ways. The most common plan is to place a large open dish of water upon the stove; but in this case the evaporation does not proceed rapidly enough. It is better to keep a large wet cloth hanging near the stove. Perhaps the best possible arrangement is that consisting in a trough of water, with a roller moving in it, and a similar roller forming a windlass about two feet above. Between the windlass and the roller an endless piece of towelling revolves. The bottom of the piece of towelling passing, of course, through the water, it is only necessary to turn the windlass a few times in order to make the whole wet; and this process may be repeated as often as necessary. The vapour constantly arising from the cloth will, if sufficient in quantity, make good the want of humidity in the stove-heated air. Such an arrangement is necessary, not only in connection with the Arnott stove, but with Mr. Strutt's contrivances, and with all the modes of heating by warmed metal surfaces. We shall consider some further arrangements which such modes of

heating render necessary, under the head VENTILATION.

Hot-Water and Steam Apparatus.

In the hot-water and steam apparatus, the immediate agent for heating is the same as in the Strutt and Arnott stoves, namely, an extensive metallic surface moderately heated. But the heating is in these cases effected by hot water and by steam respectively, and the arrangement and character of the warm surfaces are different.

The idea of warming rooms by pipes filled with hot water occurred to the Marquis de Chabannes, who first exemplified it in his own house in England. The plan has latterly been patented, and extensively acted upon by the ingenious copartnery of Perkins and Heath, London. It proceeds upon a simple law of heat, that particles of any fluid warmed above the temperature of those surrounding them, ascend. Thus, in a kettle of water upon a fire, the particles at the bottom are heated first, and immediately ascend to the surface, their place being instantly taken by cool particles from above, which again in like manner ascend as soon as heated; so that there is a constant flow of cool particles downward and warmed particles upward, until the whole are heated. The hot-water heating apparatus consists of a stout metal pipe, pervading the house in all the parts which are desired to be heated, having a valve at the top, and a coil at the bottom exposed to a furnace. This tube being filled with water from the top, and the fire being kindled in the furnace, warm particles begin to ascend, and are quickly felt at the very highest part of the pipe. The water heats gradually from the top downward, until the whole is warm. The pipe then gives off heat to the surrounding atmosphere. Such is the principle. The arrangement of the pipe may be various: the plan generally followed is to place a considerable coil of it within a pedestal or bunker, with open trellis work in front, in a convenient part of the room. It may also be made to wind round the room, behind the skirting-board, which, being perforated with holes, will allow of the entrance of the warmed air. The amount of pipe allowed to a room ought of course to bear a proportion to the size of the room, and other circumstances affecting its temperature. The pipes are generally round, and from three to four inches in diameter; but flattish pipes have sometimes been used. In the earlier stages of the history of the apparatus, a boiler was employed at the bottom for the heating of the water; but this was soon found to be attended with great danger, in consequence of the tendency of water in a tube to burst any vessel of capacity into which it may descend. The substitution of a coil of pipe was an improvement suggested by Mr. A. M. Perkins. At the top of the apparatus, the pipe expands into what is called the expansion tube, which is left empty, to save the risk of bursting by the expansion of the water. Fifteen per cent. of space is found by experience to be an ample allowance for the expansibility of the water. A compendious and readily understood specimen of the apparatus, calculated for a house of three stories, is presented in the accompanying engraving. It is important to observe that the pipe, while operating, is closed in every part, the air having been previously pumped out of it. The heat usually maintained is 180 degrees; but it can be increased to 400 degrees, where such is necessary, as it is, for example, in certain drying houses.



a Expansion Tube.
b Filling Tube.

The hot-water apparatus has been fitted up by Messrs. Perkins and Heath in various public buildings, warehouses, and gentlemen's houses;* and, while sufficiently effective for the desired end, it has been proved to be attended with as few drawbacks as any regulated mode of heating whatever. But there is a great obstacle to its general adoption in its expensiveness. If this difficulty were not insuperable, the plan, from the natural principles on which it is founded, could be applied very easily to several buildings at once, or even to a considerable part of a town—if not, indeed, to an entire city. From some central establishment, on a low level, where the heat was applied, there might proceed pipes to the various houses, in the same manner as the pipes from a gas-work. There would of course be a waste of heat in all those parts of the pipe which passed through streets and between one house and another; but this might be amply compensated by other economical features in the arrangement.†

There is a variation of the hot-water apparatus, in which it is made to take much of the form of Mr. Strutt's plan, a large coil of pipe in one hot-air chamber being the means of supplying warmed air to be distributed over the building. It has been exemplified at Coleshill, the mansion of the Earl of Radnor in Berkshire. The plan, in its ordinary form, has been applied also to vineries, conservatories, and forcing-houses, to which it must be considered as undeniably appropriate, if there be no objection on the score of expense.

Heating by steam-pipes is the only mode which remains to be considered. It was suggested nearly a century ago in the "Philosophical Transactions," but was not for many years after reduced to practice. At length it began to be introduced into factories, where a great facility existed for its operation in the boilers connected with the steam-engines. As respects its power of heating, and effect upon the surrounding air, it is identical with the plan last described, excepting only that the surface of the pipes in this case can never be at a higher temperature than 212 degrees. The size of the pipes and other arrangements are considerably different. The following is an account of the apparatus fitted up on this plan in the printing-office from which the present work is issued:—"An iron tube, on which there is a crane, carries the steam from the boiler to a connected series of long tin pipes within the building. The diameter of these tin pipes is about ten inches, and they hang from the ceiling by means of small chains a few inches in length, so as to be quite clear of every article of furniture, and every head passing beneath. There is just one pipe going along each of the two lower stories in this manner; and from each a small waste pipe goes outside to let off the waste steam and condensed water. The pipes are varnished black, to cause the heat to radiate freely from them. The whole apparatus is exceedingly simple, and is managed with perfect ease. The

* The British Museum in London, and the Register House and Justiciary Court Room in Edinburgh, are warmed upon this plan.

† A minute account of the hot-water plan is given in C. J. Richardson's "Popular Treatise on the Warming and Ventilation of Buildings." 1839.

smallest turn of the crane permits the steam to rush through, and to fill the pipes, when an immediate radiation of heat commences. So effectual is the process, that if the steam be admitted only twice a day, for an hour at a time, the premises are kept in a state of the most agreeable warmth for the whole day. There can be no proper comparison betwixt this plan of heating and that of common fireplaces. Coal fires cannot warm the air in large workshops; they only heat the air in their own immediate neighbourhood; and hence the workmen are often obliged to draw near the grate to warm themselves. According to the plan we have adopted, every part of the house is equally heated, and the whole of the workmen are as comfortable during the hardest frosts as if they were working in a pleasant summer day. In consequence of this abundant warmth, all the fires have been withdrawn. It is difficult for us to say what is the probable expense of supplying the heat, seeing that we happen to draw our steam from a boiler which is always in operation for other purposes. We believe, however, that the expense of keeping up a necessary supply of steam for such an apparatus must be very small, perhaps not more than that for a single coal fire. Our apparatus cost about £80, and this sum will doubtless be saved in the course of a few winters. A similar plan of steam-heating by means of cast-iron pipes is pursued in many places, but we approve most of tubes of sheet tin soldered together. Tin is light and cheap, and allows the heat at once to operate, and, in case of explosion from improper management, will rupture or give way without causing any mischief; whereas iron is heavy and dear, takes long to heat, and in exploding would perhaps cause some injury. Excellent, however, as is the process which we have mentioned, we do not believe that it is calculated for private dwelling-houses. In the first place, few domestic servants can be trusted with the management of any apparatus of this description, and this forms an almost insurmountable obstacle to the general introduction of the process. Secondly, the pipes are clumsy, and therefore unsuitable for passing through elegant apartments; and, thirdly, there is at times a noise of the rushing of the steam in the pipes, which would be quite insufferable in a private residence."*

"To determine," says Dr. Arnott, "the extent of surface of steam-pipe or vessel necessary to warm particular apartments, it is to be considered that the loss of heat from them occurs in three ways—1st, rapidly through the thin glass of the windows; 2dly, more slowly through the thick substance of the walls, floor, and ceiling; and, 3dly, in combination with the air which escapes at the joinings of the windows and doors, or at other openings purposely made for ventilation. Different writers and manufacturers have made very different estimates of the quantities of heat lost in these various ways, and as yet no exposition of the matters has been made with the accuracy which the subject deserves; but an intermediate estimate, as applied to common cases, may be shortly stated thus:—that in a winter day, with the external temperature at 10 degrees below freezing, to maintain, in an ordinary apartment, the agreeable and healthful temperature of 60 degrees, there must be of surface of steam-pipe, or other steam vessel, heated to 200 degrees (which is the average surface temperature of vessels filled with steam of 212 degrees), about one foot square for every six feet of single glass window, of usual thickness; as much for every 120 feet of wall, roof, and ceiling, of ordinary material and thickness; and as much for every six cubic feet of hot air escaping per minute as ventilation, and replaced by cold air. A window with the usual accuracy of fitting, is held to allow about eight feet of air to pass by it in a minute, and there should be for ventilation at least three feet of air a minute for each person in the room. According to this view, the quantity of steam-pipe or vessel needed, under the temperatures supposed, for a room sixteen feet square by twelve feet high, with two windows, each seven feet by three, and with ventilation by them, or otherwise, at the rate of sixteen cubic feet per minute, would be—

For 42 square feet of glass (requiring one foot for 6),	7
" 1248 feet of wall, floor, and ceiling (requiring 1 foot for 120)	10½
" 16 feet per minute, ventilation (requiring 1 foot for 6)	2½
Total of heating surface required,	20

which is, twenty feet of pipe four inches in diameter, or any other vessel having the same extent of surface—as a box two feet high, with square top and bottom of about eighteen inches. It may be noticed that nearly the same quantity of heated surface would suffice for a larger room, provided the quantity of window-glass, and of the ventilation, were not greater; for the extent of wall, owing to its low conducting quality, produces comparatively little effect."

* Chambers's Edinburgh Journal, p. 319

VENTILATION.

In our article on the PRESERVATION OF HEALTH, the necessity of a constant supply of fresh air for that object is so fully explained, and so earnestly insisted on, that on this occasion little more than an allusion to the subject is required. Each human being consumes the oxygen of the sixth of a cubic foot per minute, replacing it from his lungs by carbonic acid gas, a substance which cannot be inhaled again without injury. Hence the necessity for a constant change of the atmospheric contents of any room in which human beings are placed—and the same law holds with regard to all the warm-blooded animals. In an ordinary apartment, heated by a common open fire, there is an imperfect kind of ventilation always going on by means of the fire, which draws in through the door, windows, and other apertures, fresh air to supply that consumed by itself, or which the chimney-draught otherwise carries off. This is imperfect, in as far as the draught may only clear a certain space near the bottom of the room between the door or windows and the fireplace, and because it may over rarely the air of the room in instances where the apertures are unusually well closed up—also, in as far as it only operates when there is a fire, and therefore not in the summer time. It therefore becomes desirable that a regulated mode of ventilation, calculated to be thoroughly and at all times effectual, should be applied to ordinary apartments. It is not less necessary that churches, court-rooms, theatres, and all large rooms in which great numbers of persons assemble, should be subjected to a mode of ventilation, regular, certain, and complete. Nor is it unworthy of notice, that a regular means of ventilation is also required in stables, cow-houses, and other places where valuable animals are kept.

VENTILATION BY APERTURES IN CEILINGS AND FLUES IN WALLS.

The simplest and perhaps the earliest expedient for ventilation, was one formerly much employed in churches and other places of assembly. It consisted merely in a round hole of considerable size opened in the ceiling, and communicating with the outer air by a tube or trunk, having a cap over the top to keep out rain. The expired air of the assemblage, by virtue of its greater rarity, of course ascends to the ceiling, and tends to find its way out by this aperture; but it does not pass forth either rapidly or with certainty, and the plan is therefore to be considered as defective.

The plan adopted for carrying off used air in the Derby Infirmary, and other buildings warmed by Mr

Strutt's plan, appears strikingly inferior in efficiency to the expedients for heating. The whole arrangement consisted in a flue from each room, terminating in the space under the roof, through which was a passage to the outer air, protected by a turn-cap. There cannot be, we apprehend, any certainty that such flues will act for the removal of used air.

Sir John Robinson of Edinburgh has exemplified Mr. Strutt's plans in his house in Randolph Crescent, with an ingenious improvement upon the ventilation flues. Having small fires in each room—for the purpose, mainly, of drawing the warmed air from its reservoir, the well of the staircase, into each apartment—he passes the ventilation flues close beside the ordinary smoke chimneys. The consequence is, that the heat of the smoke chimney is imparted to the ventilation flue, an upward current is established, and ventilation proceeds with certainty. This is a mode of ventilation which may be advantageously adopted in new houses, but could not easily be applied to those already built. In Sir John Robinson's house, the air of each apartment reaches the ventilation flue through a slit masked by the stucco-work upon the ceiling.

In many cases, it may be found expedient to adopt a simple mode of ventilation which was suggested by Dr. Arnott, and applied in Buckingham Palace. An aperture of from four to six inches is cut in the wall over the chimney, as near to the ceiling of the apartment as may be convenient. Into this is fitted a short metal tube, having a valve suspended at the extremity next to the apartment, and capable of opening inward to the chimney, but not in the other direction, by which means a return of smoke is prevented. This simple apparatus may be painted, or otherwise made ornamental. It operates by virtue of the draught in the chimney. Whenever that is active from the presence of a fire, the valve is seen to open inwards, and a stream of air from the top of the apartment passes through into the chimney, and is carried off. The operation is precisely equivalent to the stream of air always passing into a chimney between the fire and the mantel-piece, but has the great superiority of draining off the most impure air in the room.

THE VENTILATING FAN AND PUMP.

This is a piece of mechanism which has for many years been used in factories, to which it is particularly applicable from the readiness with which a mechanic power to keep it in motion can be obtained from the steam-engine. It is placed at the top of a flue, into which branches from all parts of the establishment proceed. Consisting simply of what its name imports, it only requires to be set in motion in order to draw off the air from every apartment communicating with it. Dr. Ure calculates that a steam-engine of one horse power will drive a fan which has equal effect with a draught produced by fuel equal to twenty horse power; in other terms, the economy of ventilation is to that by chimney-draught as 38 to 1.* Of its efficacy there seems no room for doubt; but as yet there has been scarcely any attempt to show how it can be conveniently applied elsewhere than in factories. Dr. Arnott has shown pretty clearly that it has heretofore been used in a very uneconomical way, in consequence of ignorance. A far greater power has been in most cases applied than was strictly necessary, its constructors not being aware that air, like other fluids, cannot be forced more quickly through one part of a passage than it enters by another, without a super-expenditure of force. Under judicious arrangements, Dr. Arnott thinks that fans which have required steam-engines to drive them, might be made to operate by a weight no greater than that required for a large clock. He seems, however, to prefer to the fan a valved piston moving like a pump in a square or round trunk. "Such a pump," says he, "answers not only for extracting foul air, but also for forcing in pure air where wanted. It may," he adds, "be fixed in position, or may be a movable piece of furniture; to be used, for instance, to draw out air from the top of a window opened on a ball night, or from an opening in the wall concealed from view by a picture frame. By such a pump, air of perfect purity, and in any quantity, may easily be sent from any neighbouring situation, as from the top of a lofty tower, to supply a dwelling placed where unwholesome exhalations might enter by the doors and windows.

* Architectural Magazine.

FIRE-DRAUGHT.

One of the most certain and effectual of all means of ventilation is that by fire-draught. It proceeds upon the simple principle that combustion demands a constant supply of air: a fire being placed in a certain convenient situation, and closed up from all supply of air excepting through flues communicating with the rooms to be ventilated, a flow of air out of those rooms is necessarily established, and this will proceed as long as the fire is kept burning. The plan has been exemplified with success in mines, where, a fire being lighted at the bottom of a shaft, air is drawn off in all directions around and sent up the shaft; to replace which, fresh air is constantly pouring down other shafts. There is one objection to fire-draught ventilation, that, in most circumstances, it requires both attention and considerable expense; but this might perhaps be overcome by a little ingenuity. There can at least be no doubt that, where established, it most completely answers the end in view, while it is equally true that in some situations there are means of arranging it in such a way as to require neither attention nor expense.

The plan has been exemplified during the last few years by Dr. D. B. Reid, first in his class-rooms in Edinburgh, afterwards in the temporary House of Commons, and since then in various other structures, public and private. We shall endeavour to give an account of Dr. Reid's arrangements in the House of Commons, but deem it necessary first to advert to the plans of Mr. Joseph Fleming of Glasgow. Mr. Fleming originally contemplated ventilation in immediate connection with the objects of his profession (medicine), and in 1833 published a pamphlet on what he called a Disinfecting Apparatus, which he proposed to apply in hospitals and in beds for the sick generally. It consisted simply in tubes communicating between the top or back of the beds and a fire solely supported by air through those channels, so that any infectious virus arising from the patient's body was in every case carried off without coming in contact with those who stood near.

The plan was first tried in a large and densely peopled house which had long been remarkable as a focus of fever infection, in consequence of the wretchedness and filth of the inhabitants, and the narrow space allotted to them. This building, usually called from its size and appearance *the Barracks*, was connected with the factory of Messrs. Houldsworth and Son in Anderston, a suburb of Glasgow. It was divided into a multitude of small apartments, each consisting of a single room and closet, and each devoted to the accommodation of a single family. The total amount of inhabitants is rarely under 500. We have inspected this building, and can testify that the habits of the occupants, with a few exceptions, are of that uncleanly and ill-ordered character which naturally results from a mode of life in which housewifely economy is not a part of female education. Many of the inhabitants, it may be added, are Irish. The huddling of so many human beings into such small space, joined to filth, poverty, and intemperate habits, rendered the building, up to 1832, the permanent abode of pestilential disease. Five have been seen ill with

fever in one room. In the two last months of 1831, the total cases of typhus were 57. It was then that Mr. Fleming was allowed by the proprietor to apply his ventilating process. From an upper corner of each of the apartments, he led a metal tube of about an inch and a half in diameter, which, passing into the adjacent gallery, there met and joined a general pipe, nine inches in diameter, suspended immediately under the ceiling. One of these general pipes passed along each gallery in the four stories, and the whole joined in one vertical tube at the end of the house, communicating at the bottom with the base of an adjacent chimney-stalk serving the work. It follows that, when this flue is active—and practically it is so day and night—a draught is established upon the air contents of every room in the house. To regulate this draught according to necessity, a valve or damper is placed in the short horizontal channel of communication between the vertical tube and the basis of the flue. In ordinary circumstances, when the door of one of the rooms is shut, the rush of air into the aperture of the tube is sufficient to extinguish a candle held near. It becomes quite clear to any one inspecting the process, that, while the chimney is active and the aperture kept open, there must be a complete exchange of air in each room in no long space of time. It may be remarked, that no expedient has been adopted to obviate the chance of an over-rarefaction of the air-contents of the rooms. The melancholy truth is, that the doors and windows are by no means deficient in the means of admitting a full supply of fresh air. At the same time, it is to be observed that few of the tenants complain of cold as a result of the ventilation. Some have attempted to stuff up the apertures of the tubes, under an impression that too much cold air was brought in upon them; but these cases are rare, and the attempt has always been checked.

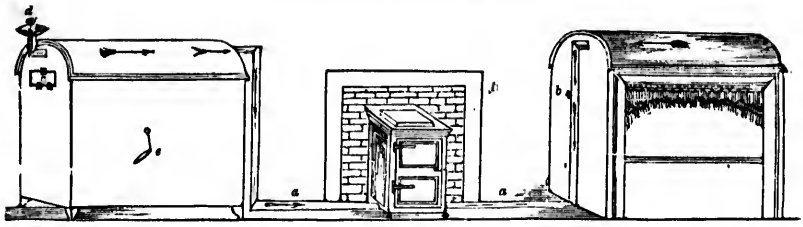
Since 1832, when this apparatus was fitted up, Glasgow has suffered more from fever than any other city in the empire in proportion. During the five years ending with 1839 there were 55,949 cases. It may well be presumed from the ordinary conditions of the Anderston house, and its previous history, that it should have had its full proportion of fever cases during that period, which would have been about 112 (taking the population of the city at 240,000). But so far from this being the case, there were only four instances of fever in the house from the beginning of 1832 till December, 1840, laying aside one year during which it was not under Mr. Fleming's charge, when there were a few more. Early in 1841, there were eight cases; but most of these, as of the previous cases, were ascertained to have been brought in from without. Since then, the house has remained free of fever. It is impossible to doubt that the change from extreme unhealthiness to the reverse is mainly owing to the ventilating apparatus—for no other condition has been changed. On this subject we have been favoured with the opinion of the proprietors, Messrs. Houldsworth and Sons. They say (March, 1841)—"Previous to the introduction of this improvement, fever was almost continually in the Barracks, and the annual number of cases ranged about fifty; during the last eight years, only a few cases have occurred, and all these, we believe, can be traced to individuals coming into the Barracks having the fever upon them at the time. We cannot expect, however, that our houses will always be free from fever, so long as a similar mode of ventilation is not generally adopted in the neighbourhood." It is not unimportant to remark, that the expense of fitting up the apparatus in the Barracks was *under fifty pounds*.

Mr. Fleming has since applied his ventilating apparatus in a steam-vessel. There are no places adapted for the reception of human beings which require ventilation more than ships, for there the space allotted to each individual is necessarily smaller than anywhere else. The sleeping berths, in particular, would be much improved in comfort by a draft being established upon the close, stifling, and often positively fœtid atmosphere which is generally experienced in them. Dr. Reid, a few years ago, showed how easily a ship might be ventilated in all its habitable parts; and in 1840–1, he was employed to exemplify his theory in the vessels destined for the Niger expedition. Since then, Mr. Fleming has been called upon to adapt his ventilating plan to the Princess Royal steamer, a passage vessel between Glasgow and Liverpool. In this case he has led a small tube from the top of each bed into a general pipe passing along under the deck, the extremity of which enters the ash-pit of a common stove. There is thus a draught out of every berth in the ship; and the consequence is a degree of comfort for which every passenger feels thankful. It may be presumed that the ventilation of a ship or steamer would be made still more effectual if fresh air were supplied in some regular manner, instead of being merely drawn in by chinks in the cabin doors. It would be easy to have flues communicating directly between the outer air and a perforated board in front of each bed. It is also obvious that, in steamers, a valved passage into the funnel of the engine would answer the purposes of draught, without the least danger.

In rooms where large numbers of workmen are assembled, a mode of ventilation is obviously of great importance. Not long since, conversing with a man who had once wrought as a journeyman tailor in London, we were informed by him that workmen of his order in that city are obliged to pursue their calling in warm close rooms, in consequence of it being thought by the masters that heat is necessary to the goods making a fair appearance in the eyes of customers. The consequence, said he, is, that working tailors generally break down at forty-five, and the latter part of their lives is often very miserable. Now, it may be true that a high temperature is necessary for the work; but a high temperature is not necessarily connected with defective ventilation. The rooms in which the tailors work might all be supplied with constant streams of fresh air, although Fahrenheit's thermometer should never stand in their apartments below 66 degrees. A liberal-minded copartnery of clothiers in Glasgow, Messrs. Lockhart, have lately had their workroom fitted with a ventilating apparatus by Mr. Fleming, the apertures in this case being distributed over the ceiling, while the means of draught is supplied by the furnace in which the irons are heated. The result in comfort is described by Messrs. Lockhart as very great; we cannot doubt that in health also, the best consequences may be anticipated.

The application of the plan to sources of morbid infection is equally simple. Mr. Fleming has fitted up several specimens of ventilated beds for hospitals or private sick-rooms, and placed them for public inspection in the warehouse of Andrew Liddell and Company, ironmongers, Glasgow. In addition to these, he has prepared a ventilating washing apparatus for the clothes of patients affected by infectious disease. The simplicity of the arrangement, united to its manifest efficiency, must be generally admired. In the accompanying wood-engraving, a stove is represented as placed in front of a common fireplace, having a bed for a patient on one side and a washing machine on the other. Air tubes, *a a*, branch off from the stove, and terminate one in the semicircular roof of the bed, the other in the semicircular top of the washing apparatus. In the washing apparatus there is a plash-wheel, of which *c* is the handle; while *d* is a filler for the admission of air and water, and *e* a door.

Infected clothes being put in by the door *e*, a sufficient quantity of boiling water is poured into the washing box by the filler. The door being now kept shut, the plash-wheel is set in motion, and driven as long as may be thought necessary for disinfecting the clothes. During



this process, the air to support combustion in the stove being supplied through the filler, passes on through the washing box, and carries with it to the fire, as soon as disengaged, all the infectious matter arising from the clothes. In place of boiling water, the clothes might be purified by steam or heated air, and the infectious virus would be carried off and destroyed in the same way. At the end of this disinfecting process, the clothes may be taken out and washed in the usual way, the foul water being previously run off through a tube placed for that purpose in the bottom of the apparatus.

The infectious matter generated by a patient placed within the bed is in like manner carried off and destroyed in the fire. To insure its complete removal, the tube passing along the roof of the bed is perforated by a series of small holes. To regulate the ventilation there is a stop-cock at *b*, which the patient or his attendant may turn at pleasure. To prevent the escape of any infectious matter from the bed, the front only is left open. The opening may be increased or diminished at pleasure by the raising or depressing of the curtain at the top. It is clear that there must be a stream of pure air constantly passing into the bed, and that any one standing immediately in front is as completely exempt from all noxious influences, as far as that patient is concerned, as if he were at many miles' distance.

An experiment on this principle is at length in the course of being made in the Glasgow Fever Hospital, in ward 8th of that establishment, which consists of two patients' apartments, each twenty-four feet square, by twelve in height, and a separate smaller room for the nurse; a stove in the fireplace of the latter is supplied with air solely by a pipe communicating in branches with apertures in the ceilings of the patients' rooms. There is accordingly a draught of air from the top of each of the patients' rooms, and this is so powerful, that on the two rooms being filled with dense smoke from wet straw, they were completely cleared in thirty-five minutes, the aggregate contents of the two being 14,000 cubic feet. It is obvious that the arrangement, although a great improvement upon no-ventilation, will only be complete when there is a particular draught from the top or back of each bed; in which case alone will the medical attendants and others be exempt from the contact of infectious matter. While we are writing the present sheet, the authorities connected with the hospital, satisfied so far with the experiment, are about to extend Mr. Fleming's mode of ventilation to the whole establishment; it is to be hoped that they will not rest content with a tube opening in the ceiling, but extend one to each bed.

A description of the arrangement made by Dr. Reid in the House of Parliament involves the principle of heating, or rather of temperature-regulation, as much as those of ventilation. The present House of Lords is a portion of the old palace of Westminster, which was formerly called the Painted Chamber. The House of Commons is the building which, down to the conflagration in November, 1834, was used as the House of Lords. They are contiguous; and beneath both there is a series of vaults, part of which (beneath the old House of Lords and present House of Commons) were those in which the gunpowder conspirators had deposited the means of blowing up the Parliament in 1605. It is in these vaults that science now conducts a signal example of one of her most striking though most simple triumphs. One vault is devoted to the purpose of introducing and purifying the air, which is done by means of a wide space towards the public street, covered with a piece of coarse gauze, to stop as much as possible of the soot and dust with which the air is necessarily loaded in the centre of a large city. Having passed into the vaulted apartment, it is completely washed with water as it rushes across to the passage beyond. The washing apparatus consists of a number of pipes laid longitudinally and transversely on the floor; each pipe is perforated with a great number of holes, and from these spout jets d'eau in all directions, so as to fill the apartment with an intense spray, and effectually wash the air as it proceeds through it. On the inner side of the vault the air is as fresh and pleasant as at the brink of a waterfall. Being thus purified, the air, if necessary, is made to pass through a vaulted chamber, containing a congeries of pipes of hot water; and being there warmed is sent on by a channel or passage to the House. The temperature of the air which is admitted can be at all times regulated with perfect nicety, by allowing it to go, more or less, through the warming room; and for the purpose of discovering at any time what is the degree of heat the persons above are enjoying, a thermometer is pulled down by a string from a concealed part of the house.

The air, thus regulated in temperature, is admitted into the house through canvas which covers the walls, and also behind the bar, seats, and tables. The canvas, which is stretched upon the walls, or rather at a little distance from them, is of a thin yellowish description, and is streaked or marked to resemble oak panels. As high up as the heads of the members, the canvas is papered in a neat style. When the air admitted in this manner all round the house, through the texture of the canvas walls, has been breathed and vitiated, it passes off through ventilators in the roof into a kind of garret, whence it proceeds along a passage, and descends a shaft to the ground. On going round by a stair to the bottom of this very strange air-channel, we find ourselves in a vestibule opening upon an immense ash-pit, into which we perceive red-hot cinders occasionally falling. We step forward and enter the ash-pit. We now find ourselves standing at the bottom of a round chimney, measuring a hundred feet high, and eleven feet broad at the base, and in which, at the height of some ten or twelve feet overhead, we observe a large blazing fire suspended on a capacious grating. There is no opening into the chimney except from the vestibule, into which all the vitiated atmosphere of the House is poured—the fire being trimmed only by means of a small door on the outside, but which is usually kept shut—and therefore this forms the great organ or draught in this extensive ventilating apparatus.

For the House of Commons, the air is admitted through gauze into a lower vault, in the same manner as for the Lords; passes, if required, through a heating room, and is thence conducted in a purified state to a

space beneath the floor. For its admission the floor and rising steps are penetrated with millions of small holes, and rising in these, it passes through a coarse carpeting into the house. Having there performed its office, the air passes off by openings round the edges of the panels in the ceiling into a garret above, where it is led away by a passage to the descending channel to the ash-pit and fire which has already been described, and which answer for both Houses. In the garret there is a passage containing a sash-window, which assists in regulating the supply of air and draught. In ordinary circumstances, the opening through which fresh air is supplied to the House of Commons allows 60 cubic feet to pass in at the rate of 10 feet per second; 60 multiplied by 10 makes 600 feet per second, and this again multiplied by 60 seconds, gives, 36,000—that is, thirty-six thousand cubic feet of fresh air supplied every minute for the consumption of the House. The air, likewise, can be admitted in either a cold or warm, moist or dry state, at a moment's notice. On one occasion, seventy gallons of water were sent in in the shape of moist air in the course of a few hours. The feelings of the members being very various, the regulation of these details, as may be supposed, is a matter of extreme delicacy. The great object desired by the learned superintendent is to afford at all times a profuse supply of the best air for breathing, without any sensible feeling of draught to the members; and this he seems to have admirably accomplished by his ingenious arrangements for both Houses. It has been alleged, that the method of admitting the air through the carpet on the floor has the effect of raising a dust in the apartment; but this is not the case. Every precaution is taken to avoid this, not only by the universal porosity, but by the plans adopted for brushing the feet of the members as they pass along the passages and lobbies. It is further necessary to observe, that the plans, at the best, are only preparatory to others of a more perfect kind in connection with the new Houses of Parliament now in course of erection, and for the superintendence of which Dr. Reid is now necessarily resident on the spot.

It is abundantly evident that the choice of a mode of ventilation, and also its minor arrangements, must often be determined by considerations of local convenience and of economy. A factory and a steam-vessel present an ever active furnace or chimney, into which a flue for ventilation can be conducted. In these situations, accordingly, there may be ventilation absolutely without cost. In the same situations, the mechanic power for a fan or pump can be readily obtained, but in that case the power is both a matter of cost, and it requires attention to regulate it. Generally, therefore, though not perhaps in all instances, the plan by fire or chimney draught will be preferable in such situations. Where there is an apparatus for warming as well as for ventilating, and where economy is an object, the draught might without much difficulty be effected by the fire which is used for the former purpose. It would only be necessary to conduct flues from the various rooms down to the ash-pit of the furnace. In this case, however, there would be a certain loss of control over both processes. In buildings already completed there might be a tolerably efficient ventilation obtained by flues conducted into the kitchen chimney, which, being always active, would keep up a nearly unvarying draught. Dr. Arnott has suggested that the fresh air in entering might be heated to nearly the desired temperature, especially in churches and other crowded places of assembly, if the flues for its admission were made to pass longitudinally through the centre of those by which the used air was passing out. Another and simple mode of draught has been practised in connection with the hot water warming apparatus, consisting merely of a flue into which a small coil of the hot water-pipe is introduced. This small coil, situated in the flue, and near its bottom, acts precisely like the fire in the chimney for ventilating the Houses of Parliament.

For obvious reasons, the admission of warm air is generally at the bottoms of rooms, while the used air is drawn off by apertures in or near the ceiling. Mr. Perkins, it appears, pursues exactly the reverse plan, conceiving that it "introduces the warm temperature insensibly, and removes the impurities of the room more effectually." Mr. Alfred Aimer, an architect, also adopts this plan; he remarks that, "with upward ventilation, a great part of the vitiated atmosphere [of crowded rooms] being specifically heavier than common air, is liable, by the slightest check or condensation, to be thrown down and mixed with the air which is already partly unfitted for the purposes of life. But let the ventilating current descend, we have a bright atmosphere consisting of an immense reservoir of pure air, arriving immediately at the lungs, and which, as it becomes contaminated, is drawn downwards by a force with which most accidents will co-operate."*

GAS-LIGHTING.

The existence of an inflammable air, as a natural production, has been known from a period of great antiquity. It was observed to issue spontaneously from fissures in the earth; and we are told that it has been employed in such situations, as a source of light and heat, both in ancient and modern times.

This natural gas is also found in abundance in some coal-mines, where, being liable to mix largely with the air when ventilation is defective, it constitutes the "fire-damp" so destructive to the miner. From an old wrought-out seam at Wallsend colliery, "a discharge of this gas takes place, through a four-inch metallic pipe, of two cubic feet per second. The pipe is carried up as high as the head-gear above the shaft; and from its orifice issues, with a roaring sound, the stream of gas, which, having been ignited, forms a flag of flame seven or eight feet in length, conspicuous by day, and at night illuminating the entire neighbourhood."

The artificial production of an inflammable air from coal is first mentioned in a letter by the reverend Dr. John Clayton of Kildare to the Honourable Robert Boyle, who died in the year 1691. In this letter, published in the "Philosophical Transactions" for 1739, he states, that he distilled coal in a close vessel, and obtained abundance of gas, which he collected in bladders, and afterwards burnt for the amusement of his friends. Other experimenters, among whom Bishop Watson is conspicuous, followed Dr. Clayton, and the properties of coal-gas, and the method of preparing it, thus became well known to chemists.

It was only, however, esteemed as a philosophical curiosity until the year 1792, when it attracted the attention of Mr. Murdoch, an engineer, then residing at Redruth in Cornwall. In that year he commenced a series of experiments on the gases obtained by the action of heat upon coal, wood, peat, and other inflammable substances, and actually prepared coal-gas on a scale sufficiently large to light up his own house and office. Five years after, while living at Cumnock in Ayrshire, he again erected a coal-gas apparatus. In 1798, he was engaged to put up his apparatus at the manufactory of Messrs. Boulton and Watt, Soho, near Birmingham, where he continued to experiment, with occasional interruptions, until the year 1802. It does not appear, however, that much attention was excited by these first efforts at gas lighting, except among a very few scientific individuals, until the general illumination at the peace of Amiens afforded opportunity for a more public display. On this occasion, the front of the manufactory was brilliantly lighted up by the new method, and it at once at

* Richardson on Warming and Ventilation, p. 78

tracted the wonder and admiration of every one who saw it. "All Birmingham poured forth to view the spectacle; and strangers carried to every part of the country an account of what they had seen. It was spread about everywhere by the newspapers; easy modes of making gas were described; and coal was distilled in tobacco-pipes at the fireside all over the kingdom."

By the exertions of a Mr. Winsor, a company was formed for supplying London with gas; but it struggled for many years with the difficulties at once of inexperience and public prejudice, and was a source of loss to many individuals. At length most of these difficulties were overcome, and gas-lighting began to spread over the kingdom. Its progress in dwelling-houses has been retarded by several considerations, most of which are now in a great measure overcome. It was injurious to delicate furniture, and to many of the wares exposed in shops; it often caused headaches when used in close apartments; and, above all, it was dirty, and had a most disagreeable smell.

Science, however, has not been deaf to these complaints urged against the obnoxious qualities of her gift; by means of the joint labours of the chemist and practical engineer, all reasonable grounds of objection have been long ago removed; and the art is now so perfected in our best gas-works, that it is doubted whether much remains to be discovered either for simplifying the process or improving the quality of the product.

It is true that unburnt gas has still a disagreeable smell, but this, instead of being an evil, is in reality a most valuable property; it thus gives warning of its own escape, at once directing the attention of the consumer to his stop-cocks or fittings, without some imperfection of which, the smell of gas cannot be perceived.

The success which has attended gas-lighting wherever it has been introduced, has now effected its adoption in almost every town in Great Britain. The continental nations are slowly following our example, where coal can be obtained. In America, it is used extensively in the large towns; and it has even reached the remote colony of New South Wales, the town of Sydney being now lighted in this manner.

The employment of gas at a distance from towns is limited by the expense of the apparatus compared with the quantity of light required; but where the annual expenditure for light is not less than £40, it is probable that gas might be made with advantage.

The employment of gas made by the decomposition of oil was at one time common. It had two great advantages over coal-gas, namely, a greater brilliancy of light, and a much simpler mode of preparation. These qualities, however, have not enabled it to compete with the superior economy of its rival; and it is so fast going out of use, that it does not appear to require further notice in this short paper.

NATURE AND PROPERTIES OF COAL-GAS.

In their physical properties, gases are similar to common air, which is itself included among them. Like it, they are elastic, for the most part invisible, and possessed of little weight when compared with liquids and solids. They are either simple—by which is meant that they consist of only one ingredient—or compound. We find among them some that are capable of burning when supplied with common air; others that do not burn, but, like common air, assist the combustion of inflammable substances; while a third class have neither of these properties.

The gas prepared from coal is neither a simple nor a single gas; it is a very variable mixture, chiefly composed of two inflammable gases, commonly known by the terms, olefiant gas, and light carbureted hydrogen. Both these gases are compounded of hydrogen and charcoal, in definite proportions. The first, namely, olefiant gas, is composed of 2 atoms of hydrogen with 2 atoms of charcoal; or by weight, 2 hydrogen to 12 charcoal Its specific gravity—that is, its relative weight when compared with common air—is 9722, common air being considered as unity, or 1·000. The weight of 100 cubic inches is 29·652 grains. When passed through red-hot tubes, it is easily decomposed, depositing charcoal, and evolving light carbureted hydrogen and hydrogen. When pure, it has no taste, and scarcely any smell; it burns with a dense white light, combining with three times its bulk of oxygen; or by weight, 14 olefiant gas with 48 oxygen.

The second, namely, light carbureted hydrogen, is composed of 2 atoms of hydrogen combined with 1 atom of charcoal: or by weight, 2 hydrogen to 6 charcoal. Its specific gravity is ·5555; the weight of 100 cubic inches is 16·944. It does not part with its carbon when passed through red-hot tubes, unless the heat is very intense. It is this gas which is met with in coal-mines. According to the experiments of Sir Humphry Davy, it forms explosive mixtures with air when the latter is mixed with it in any proportion between 5 and 14 times its bulk; it burns with a yellowish flame, combining with twice its bulk of oxygen; or by weight, 8 light carbureted hydrogen to 32 oxygen.

Other gases enter into the composition of coal-gas, though in smaller proportions; thus hydrogen, carbonic oxide, and nitrogen, are uniformly present; and it is inferred from the result of experiments by Dr. Faraday on oil-gas, that coal-gas also contains certain other compounds of hydrogen and charcoal in a state of vapour. To these last, in which the proportion of charcoal is very high, both the smell and a considerable increase in the luminous property are attributed.

An analysis of 100 measures of coal-gas, of specific gravity ·650, by Dr. Henry, is as follows:—

Olefiant gas	16
Carbureted hydrogen	62·2
Carbonic oxide	3·5
Nitrogen	1·3

Mr. Clegg has given an analysis of 100 parts of gas, specific gravity ·471, as follows:—

Olefiant gas	8
Carbureted hydrogen	72
Carbonic oxide and hydrogen	13
Carbonic acid	4
Sulphureted hydrogen	3

The relative proportions of the different ingredients in coal-gas are ever-varying, being dependent upon the quality of the coal from which it is made, and to a considerable extent upon the methods employed in its preparation; and, as may be supposed, it must vary also in its specific gravity and luminous quality. When it is made in the best manner from good coal, the specific gravity is sometimes as high as ·675, or even ·700; in other circumstances, it is as low as ·400, or even lower. The former specific gravity indicates with tolerable certainty a large proportion of olefiant gas; the latter a superabundance of light carbureted hydrogen and hydrogen. And as the amount of light evolved by combustion depends greatly upon the quantity of olefiant gas, which has a high specific gravity, the specific gravity of any specimen of coal-gas may be taken as a pretty correct indication of its actual value —the heaviest gas giving the most light, and *vice versa*.

It is a curious fact, that the dilution of the heavier gases by hydrogen does not only detoriorate their quality by the actual amount of dilution—as in the familiar example of spirits and water—but to a much greater extent. This fact, important to the makers of gas, has been experimentally proved by the author of the article *Gas-Light*, in the "Encyclopædia Britannica." In this article it is thus stated:—"In the first experiment, we took a portion of coal-gas, of the specific gravity ·67, which we found consumed at the rate of 4400 cubic inches per hour, and yielded the light of 11 candles, being 400 cubic inches per hour for the light of one candle. This gas being diluted with a fourth part of its bulk of pure

hydrogen, acquires the specific gravity ·55, and wasted away at the rate of 6545 cubic inches per hour, yielding the light of 10 candles. As a fifth part of the compound gas was hydrogen, the remaining four-fifths, amounting to 5236 cubic inches, was the quantity of the coal-gas which, in its diluted state, gave the light of 10 candles for an hour; so that 524 cubic inches of the original coal-gas were requisite to give the light of one candle for the same time. But in its unmixed state, 400 cubic inches were sufficient to give the light of one candle for an hour, and consequently the deterioration caused by the dilution was in the ratio of 524 to 400, or of 100 to 76, being 24 per cent."

A similar or even greater proportionate deterioration is caused by the carbonic oxide and nitrogen commonly present in coal-gas. Their amount, however, is small when compared with the hydrogen occasionally found, and it is much less under the control of the gas-maker.

Two other gases, namely, carbonic acid and sulphureted hydrogen, are sometimes mixed with coal-gas; but they are to be regarded as impurities, which ought always to be separated by the manufacturer, and not as constituents of the gas. They may be detected by the following processes:—

1. Shake a portion of the gas, with lime-water, in a phial. If carbonic acid be present, the water will become turbid by the formation of carbonate of lime.

2. Write on, or wet a slip of paper with a solution of sugar of lead; and while still wet, expose to a stream of the suspected gas. If sulphureted hydrogen be present, even to the extent of one part in twenty thousand, it will be at once detected by the browning or blackening of the solution of lead.

MANUFACTURE OF GAS.

The best coal for gas-making is that which is called *cannel* or parrot. It is characterized by its great hardness and close texture; its colour is dark-brown, approaching to black; it does not soil the fingers when handled; and it has a splintery conchoidal fracture, the broken surface exhibiting a peculiar velvety lustre.

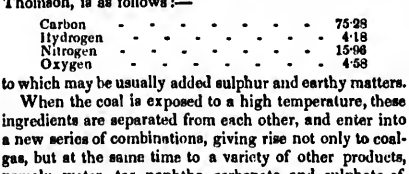
The best parrot we have seen is procured at the Marquis of Lothian's colliery, near Newbattle, Mid-Lothian; its specific gravity is 1·2115. The produce of gas from this coal, on the large scale, is usually about 1000 cubic feet from 200 lbs., and its specific gravity is sometimes as high as ·700. We have seen a small balloon filled with 800 cubic feet of this gas, which would not ascend, to the great disappointment of the experimenter, who had found no difficulty on former occasions with an inferior quality of gas.

The analysis of Newcastle coal, according to Dr. Thomson, is as follows:—

Carbon	75·28
Hydrogen	4·18
Nitrogen	15·96
Oxygen	4·58

to which may be usually added sulphur and earthy matters.

When the coal is exposed to a high temperature, these ingredients are separated from each other, and enter into a new series of combinations, giving rise not only to coal-gas, but at the same time to a variety of other products, namely, water, tar, naphtha, carbonate and sulphate of ammonia, carbonic acid, and sulphureted hydrogen. These substances are separated from the gas in the apparatus which we have attempted to exhibit by the following wood-cut:—



Where dimensions are stated, they are taken from a small gas-work belonging to a town of 5000 inhabitants. A represents the retort, of which several are commonly in use at once. It is a cylindrical or D shaped vessel of clay or cast-iron, about 8 feet in length and 20 inches in ternal diameter. It is built horizontally into a furnace, either singly or otherwise, in such a way that the fire can act completely around it, so as to keep it at a full red heat. Iron retorts have, until of late, been almost exclusively used, but they are inferior in almost every respect to the clay retort which has been lately introduced.

For instance, the latter is only one-third of the cost of iron, and we state with confidence that it is more durable, that it can be heated with less fuel, that it is easier kept at a uniform heat, and that it consequently produces a larger quantity of gas.

The retort, whether of clay or iron, has two openings both external to the building; one of them is the end of the cylinder, which is furnished with a closely-fitting lid of iron; the other is an aperture in its upper surface for the exit-pipe, which passes from the retort to B, a vertical section of the hydraulic main—this is a round or square vessel of iron about 10 inches by 14 in size. It passes above and in front of the whole line of retorts; it is half filled with liquid, into which the exit-pipe dips; it serves to collect the gas and other matters from any number of retorts, and to cut off its escape by any retort which may be open. It is connected by means of a wide pipe with C, the tar-cistern, in which the tar and every thing deposited from the gas by cooling is collected. From the tar vessel a tube rises in a sloping direction to D, the condenser—a series of tubes through which the gas is made to pass, that it may be thoroughly cooled. To the condenser there is sometimes attached E, an upright cylindrical vessel filled with brushwood, through which the gas passes before it is sent to F, the chemical purifier There are usually several vessels of this kind, and of various forms; they contain quick-lime, either dry or mixed with water to the consistence of cream. From the purifier a tube passes to the bottom of the tank in which G, the gasometer, is suspended—this is a large vessel of sheet-iron for holding the gas.

The retort being heated to red heat, the charge of coal, about 200 pounds or upwards, is quickly shoveled in, and immediately gives off dense smoke and flames. The mouth of the retort is now closed by its lid, which extinguishes the flame by shutting off the air, and leaves no outlet for the dense vapours arising from the coal, except by the exit-pipe; they rush through this tube, and are heard bubbling up into the hydraulic main until the charge is exhausted.

It is of importance in this part of the process to attend to the temperature of the retort; for if it is too hot, some of the heavy gas will be decomposed, depositing part of its carbon, and forming light carbureted hydrogen; if, on the contrary, it is not of a certain temperature, there will be formed a large proportion of tar, and the gas will be light and of bad quality. It is also essential to draw the charge before it is quite exhausted, as the last portions of gas consist chiefly of hydrogen and carbonic oxide, both of which, as already stated, have a most injurious effect upon the quality of the whole product.

The time required for a charge of cannel coal is from three to four hours. As soon as one is withdrawn in the form of coke, a second is thrown in, the process being thus continued uninterruptedly night and day.

The dense vapours which pass from the retort into the hydraulic main, consist of coal-gas, mixed with tar, water, naphtha, salts of ammonia, carbonic acid, sulphureted hydrogen, &c. Being subjected to a process of cooling in all parts of the apparatus as far as the brushwood-box, the impurities are condensed, with the exception of the carbonic acid and sulphureted hydrogen; and from the sloping or descending direction of the apparatus to the

tar-cistern, they collect in it, and are pumped off as occasion requires. A considerable quantity of carbonate and sulphate of ammonia is also deposited in the tubes of the condenser in a crystalline form, and requires to be cleared out periodically. This is easily accomplished by passing a current of steam down each pair of tubes, by which these salts are at once dissolved. The gaseous matter still retains particles of tar mechanically mixed with it, from which it is freed by being forced through the brushwood vessel. It is now made to enter the chemical purifiers, where it is either washed by agitation with a mixture of quick-lime and water, or is passed through a succession of trays covered with thin layers of this substance in a slightly moistened state. In this process the lime combines with the sulphureted hydrogen and carbonic acid, forming hydrosulphuret and carbonate of lime, which, being both solid, are retained, and the gas now purified is at once passed into the gasometer, where it is stored for nightly use.

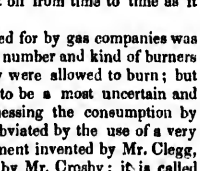
DISTRIBUTION OF GAS.

The distribution of the gas from the gasometer to its places of consumption is effected in cast-iron pipes called mains. They are cast in pieces of from 4 feet 6 inches to 9 feet in length, according to their diameter, and are joined together to any required length. The diameter of the mains varies from 1½ inches to 16 or 18 inches, and depends in every case upon the quantity of gas required to flow through them, taking into account at the same time the distance it has to flow, and some other data of less importance—such as the elevation above or below the horizontal line, the curvatures in the pipe, the specific gravity of the gas, &c., all of which are matters of exact calculation to the practical engineer.

The pipes branching from the mains to supply gas to dwelling-houses or manufactories are called service-pipes. They are commonly made of wrought iron or pewter, and vary in diameter according to circumstances.

Throughout all the ramifications of the fittings, the pipes have, or should have, an inclination to the main, and the main itself should incline towards the gas-work. The necessity for this arrangement arises from the presence of watery vapour in small quantity in the gas; being condensed into water in the pipes, it naturally collects in the lowest part, and at last interrupts the continuous flow of gas, so as to cause a flickering of the flame in the burners. Where the proper inclination of the pipes cannot be attained, this is obviated by placing a stop-cock and pipe at the part where liquid is apt to collect, so that it can be let off from time to time as it accumulates.

The quantity of gas charged for by gas companies was at one time regulated by the number and kind of burners employed, and the time they were allowed to burn; but this was everywhere found to be a most uncertain and unsatisfactory method of guessing the consumption by any individual. It is now obviated by the use of a very simple and ingenious instrument invented by Mr. Clegg, and subsequently improved by Mr. Crosby; it is called the gas-meter, and consists of a hollow case of iron, containing an inner cylinder or drum, so constructed that the gas passing through it, by the pressure it receives at the gas-work, causes it to revolve on an axis; each revolution allows a known quantity of gas to pass through the water, with which the outer vessel is partially filled, to the exit-pipe, and as the revolutions are registered by wheel-work and an index, the quantity of gas consumed is indicated with considerable accuracy. It is usually examined quarterly by a person employed by the gas company, who charges the consumer according to the quantity indicated.



The rate at which gas escapes from an open burner is determined, and to a certain extent regulated, by the pressure applied to it at the gas-work. This is increased or diminished by the application of weights to the counterpoise of the gasometer, and is measured by the elevation of a column of water in a bent glass tube. The usual pressure is about one inch of water above the atmospheric pressure. By the experiments of Messrs. J. Milne and Son, Edinburgh, it appears that every addition of one-eighth of an inch to the pressure causes an extra expenditure equal to about fourteen per cent., and variations to a much greater amount than this are not unfrequent. It is of usual occurrence, for instance, in the vicinity of large manufactories, when their lights are extinguished; and though attention is usually paid to this at the gas work, it is impossible so accurately to regulate the pressure according to the quantity of gas required by any particular main, as to obviate all loss or inconvenience from this cause.

An increase of expenditure is also experienced in the lights that remain burning. When other lights in the same premises have been put out, the gas that supplied these burners increases the pressure in the pipes, and is diffused over the other lights in the premises; and if not checked, there will be comparatively little reduction in the expenditure, although one-fifth of the lights are extinguished. To obviate these inconveniences, instruments called *governors* or *regulators* have been constructed by different individuals. The following wood-cut represents a regulator invented by Messrs. J. Milne and Son, which has been found to answer well in the premises where this sheet is printed. It can be readily placed upon any service-pipe, and being adjusted to the pressure required, it gives a regular flame and expenditure of gas, notwithstanding any variation of pressure in the main. "It is a very general complaint in cotton-mills, that the light in the under floors is deficient, while at the upper floors there is a greater supply of gas than is necessary. This inconvenience arises from the upper floors being subject to less atmospheric pressure than the under one, every additional rise of ten feet making a difference on the pressure of about $\frac{1}{10}$th of an inch. Suppose a mill of six floors is supplied from the gas main at a pressure of $\frac{6}{10}$ths, and that the difference of altitude between the highest and lowest lights is equal to fifty feet, the gas in the highest or sixth floor will issue from the burners at a pressure of $\frac{1}{10}$ths, the fifth floor at $\frac{2}{10}$ths, the fourth at $\frac{3}{10}$ths, and so on. To gain full advantage, in this case, from the regulator, one should be placed in each floor; and in this manner a regulator placed in the top or sixth floor, and adjusted to $\frac{6}{10}$ths of an inch pressure, will send the surplus pressure of $\frac{5}{10}$ths to the floor below; another regulator placed in the fifth floor, also set to $\frac{6}{10}$ths, will send the surplus pressure of $\frac{4}{10}$ths down to the fourth floor; a regulator on the fourth floor will send the surplus $\frac{3}{10}$ths to the third floor; and the regulator in it will send its surplus $\frac{2}{10}$ths to the second floor. Between that floor and the ground, the fall being ten feet, the remaining surplus of $\frac{1}{10}$th is lost; and thus a uniform pressure of $\frac{6}{10}$ths will be established over the whole building; and to prevent any inequality from outward pressure, a regulator ought to be placed in the ground floor also."

BURNING OF GAS.

When coal-gas is burning, it combines with the oxygen of from 10 to 12 times its bulk of common air, or

even more, the quantity varying according to the quality of the gas. By this combination, which in fact constitutes combustion, watery vapour and carbonic acid are formed, the former being composed of all the hydrogen of the gas, with 8 times its weight of oxygen, the latter consisting of all the charcoal, united with oxygen, in the proportion of 6 to 16 by weight. These products, which are similar to those from a candle or lamp, mingle with the air of the apartment, and are removed with it in the course of ordinary ventilation. In some circumstances, the watery vapour is condensed on the windows; and in street lamps it may be seen, when the weather is cold, bedewing the inside of the globes, and even collecting in considerable quantity at the bottom.

The carbonic acid is not removed in the same manner by condensation, and it may accumulate to a hurtful extent; this can only happen, however, where ventilation is peculiarly defective, and the remedy is sufficiently apparent. When the carbon is not all consumed, it flies off in smoke—an occurrence which should be guarded against, not only on account of its offensive qualities, but also from the great loss of light in proportion to the gas expended, which it invariably indicates.

The emission of light, though usually an effect of combustion, is yet a different phenomenon. Many substances are incapable of burning, and yet emit the most brilliant light when they are intensely heated. Gases possess this quality in a very feeble degree. Air, indeed, may be so hot that a solid body becomes luminous in it, while it gives off no light of itself. The temperature at which solids begin to emit light is about 800 degrees of Fahrenheit; they are then incandescent, or red hot; and if the temperature be increased, they become more and more luminous, until at 4000 or 5000 they are so brilliant that the eye cannot look on them without pain.

The lime-ball light is an example of this fact; it gives an intense light without being itself burnt. Pure hydrogen burns with a pale bluish flame; and coal-gas, when made to burn without depositing its charcoal, by reducing its flame to a speck, or by previously mixing it with common air, gives also a feeble blue light. The light from coal-gas, then, actually comes not from the gas itself as gas, but from the particles of charcoal which are separated from their gaseous combination by the incipient combustion; they exist as solid charcoal in the flame, and being heated by it to intensity, they are highly incandescent.

The presence of charcoal in a free state can be detected in a gas or candle flame by the very simple experiment of introducing the edge of a white plate into it; at the lowest part of the flame where it is still blue, the plate is not affected—the charcoal is not yet deposited; the same happens at the top of the flame, the charcoal being now burnt; but in the middle, at that part from whence the light is seen to be chiefly emitted, the plate is instantly coated with pure charcoal.

It will now be understood that the manner in which gas is burnt may actually have an effect upon the amount of light derivable from a given quantity, the condition for obtaining the largest amount being, that the charcoal deposited in the flame shall be heated to the greatest possible intensity. This condition is very differently attained by the different burners in common use. It is found by experiment, that when an argand burner is constructed with holes of a proper size, and of a proper distance from each other, with an internal tube so proportioned as to admit the exact quantity of air necessary for the perfect consumption of the gas, it gives more light than can be obtained from the same quantity of gas by any other method of burning.

In the argand, the flame is steadied and the current of air increased by the use of a glass chimney, which sensibly diminishes the size of the flame, at the same time increasing its brilliancy It has been proposed to improve this burner by heating the air with which it is supplied by means of a double chimney, the outer glass being so constructed that the air must descend between it and the inner glass before it arrives at the burner; and it has been stated that a saving of gas to the extent of 20 per cent. may be effected in this manner. This assertion has, however, been contradicted by other experimenters; and certainly the plan has not been adopted into common use.

The proper size of the holes for an argand burner, and the length of the flame which gives the greatest proportion of light, have been experimentally determined by various individuals. Drs. Christison and Turner state that the diameter which appeared to answer best for coal-gas of the specific gravity ·6, when the holes are ten in a circle of three-tenths of an inch radius, was a thirty-second of an inch; the distance between the holes should be about one-seventh of an inch. A series of experiments by the same individuals on the relative amount of light from flames of different lengths in an argand burner, show that the light is increased about six times for the same expenditure by raising the flame from half an inch to three or four inches; but beyond this height, the gain was comparatively little in the burners experimented on.

Other burners in common use are known by the names—single jet, fish-tail (so called from its resemblance in shape to a fish's tail), and bat-wing. The relative quantity of light which they yield from the combustion of similar quantities of gas is thus given by Dr. Fyfe; namely, single jet, 100; fish-tail, 140; bat-wing, 160; argand, 180.

These burners are commonly used in street-lamps, and they are convenient in some circumstances; for instance, in small apartments where less light is required than is given by an argand, burning at its full height, namely, three or four inches; and it should be distinctly known, that the greatest amount of light is only obtained from any given quantity of gas by burning it in this manner.

The single jet burners, with an aperture from a twenty-eighth to a thirty-sixth of an inch, gives most light in proportion to the gas burnt, when the flame is five inches in height. In the experiments of Drs. Christison and Turner, they found that in the case of coal-gas of specific gravity ·602, while the lights emitted from a two-inch and five-inch flame were as 556 to 1978, the corresponding expenditures were to each other as 605 to 1437. Hence the ratio of the lights, in reference to the expenditure, was as 100 to 150.

If the flame smokes in an argand, it is evident that some adjustment is necessary, and the gas should either be lowered or the chimney contracted until it gives a clear cylindrical flame of three or four inches in height. In the fish-tail burner, if the flame flares or makes a noise in burning, the gas should also be lowered; but to diminish either much below these points does not effect a saving of gas in proportion to the diminution of light. Hence the important conclusion, that it is more economical when the light is too strong to procure a smaller kind of burner, or where several lights are used, to put out some of them altogether, than to lower the flame in the whole.

Various calculations of the relative expense of gas-light, compared with other lights, have been made Thus, when tallow-candles are 9d. per lb., wax-candles three times the price of tallow; train-oil 2s. per gallon, and coal-gas 9s. per 1000 cubic feet, it is computed that the relative expense will be as under, namely,

Wax	100	Oil	5
Tallow	25	Coal-gas	3

In a recent paper by Dr. Fyfe, the relative expense is computed as follows:—Gas giving 12 per cent. condensation with chlorine—that is containing 12 per cent. olefiant gas, at 8s. 6d. per 1000 cubic feet—being 1, the

expense of wax-light of equal quantity will be about 14; sperm-oil, 8; tallow-candles, 7½; rectified whale-oil, 5; common train-oil, in an improved description of burner, 2.

Many individuals, who complain that the adoption of gas-light has proved no saving to them, will be surprised at the above statements. They will find, however, on examination, that they now light up their houses far more brilliantly than they were accustomed to do when candles or oil-lamps were in use, and that their equal expenditure is thus accounted for.

In addition to its greater economy, gas-light may also be pronounced safer than any other ordinary light. It produces no sparks, it cannot be carelessly placed in contact with bed-curtains or substances easily ignited, and it requires scarcely any attention. It may be turned down in an instant to the most minute speck of flame, ready to be restored when necessary by the simple turning of the stop-cock; and even when it escapes by the carelessness of an attendant or a defect in the fittings, it at once indicates the accident to the whole household by the disagreeable smell which it occasions. From the large quantity which must be mixed with air before it becomes explosive, it is scarcely possible that this accident could occur in any ordinary apartment, even if the gas were allowed to escape on purpose. And as its smell so well indicates its presence in cellars or other confined situations, where it may have escaped in quantity from the accidental breaking or leakage of a pipe, it is only by the grossest carelessness or ignorance that a light will be approached to it before it has been allowed to escape by the free admission of air. There is no such thing as the bursting of a pipe or the blowing up of a gasometer. A gas pipe may be broken, as any other pipe, by accident; and if a leaky gasometer is covered over by a building, an explosion may then take place; but these are accidents which can very rarely occur, and they do not concern in any way the ordinary consumer of gas.

BUDE LIGHT.

We have now to notice a new method of using coal-gas, lately introduced into the House of Commons, an account of which is thus given in "Chambers's Edinburgh Journal,' No. 445:—"The light employed is the invention of Mr. Goldsworthy Gurney, and is called the 'Bude Light,' from the name of his residence in Cornwall, where it first became known to him. In 1823, Mr. Gurney published a work on the elements of chemical science, in which he described the powerful light produced from lime by the action of the mixed gases. This light, about seven years afterwards, was employed by Lieutenant Drummond on the Trigonometrical Survey of Ireland, in consequence of which it took the name of the 'Drummond Light.' A Committee of the House of Commons on light-houses, in 1834, recommended the lime-light to be experimented on, with a view to remove the practical difficulties connected with the subject, and adapting it for light-house illumination. In consequence of Mr. Gurney having first announced the discovery of the light, he was recommended by the committee to the Trinity House to carry out the experiment. In the course of his engagement in this office, he discovered the present light, which he considered better for light-house purposes, and, as already mentioned, called the Bude Light. This light is produced by introducing oxygen gas in the interior of the flame of a lamp. An ordinary flame is hollow, the exterior part being only ignited by the atmosphere; the interior part is unburnt, containing the vapour of oil and carbureted hydrogen; and the burning of this unused interior vapour, as quickly as it is distilled, by the admission of oxygen, forms the principle of the Bude Light. As soon as a small tube, conveying a stream of oxygen, is introduced into the heart of the flame, the light is immediately increased in its intensity. Since this valuable discovery was made, Mr. Gurney has effected various alterations and improvements on the light. Formerly he used oil, but now he employs common street gas. This gas, however, is made to pass through a box containing naphtha, which naphthalizes it, and renders it equal to the best oil without the trouble of wicks. The London street gas, it is necessary to explain, is of bad quality, and is improved by the vapour of naphtha. The Edinburgh gas, being much superior to it, would not require any such assistance. The apparatus for supplying the oxygen is placed in a vault adjacent to Dr. Reid's ventilating process. It consists of two iron retorts built over a furnace, and in these is put a certain quantity of oxide of manganese (a metallic substance which resembles brayed coal in appearance), from which oxygen is evolved, and led away in pipes to a gasometer; from the gasometer small pipes proceed to the burners in the House, each conducting a stream of oxygen into the heart of the flame. The light so produced is most intense in brilliancy, but is softened by the intervention of ground glass, and illuminates, with a powerful effect, the whole interior of the apartment. A more perfect substituto, in every respect, for day-light, could not, I believe, be found. The flame being supplied freely with oxygen, a comparatively small quantity of atmospheric air is abstracted or consumed, and all offensive heated air from the combustion is carried away in a small tube into Dr. Reid's ventilating gallery above. Before the introduction of this beautiful light, the House of Commons was illumined with 240 wax candles dispersed about in different parts—a method of lighting which Sir David Brewster has described 'as most absurd, and such as no person at all acquainted with the physiological action of light on the retina, and the principles of its distribution, could have adopted.'* Dr. Ure, on being examined by the committee of members respecting the power of the Bude Light, previous to the substitution of gas for oil, observed—'I made experiments upon it very carefully in my own house last night, and compared its relative illuminative powers with argand lamps and candles with great pains, both by the method of shadows and also by Mr. Wheatstone's photometer. Mr. Gurney's larger Bude lamp, furnished with a wick of five-eighths of an inch, but emitting a white flame of only three-eighths in diameter, was found to afford thirty times more light than a wax candle, and nearly three times more light than the standard flame of the mechanical lamp, which was equal to from ten to eleven candles. Secondly, Mr. Gurney's smaller Bude burner, with a flame one quarter of an inch, was found, by the same methods, to afford a light eighteen to twenty times greater than a wax candle.'

"The adoption of the Bude Light in the House of Commons, as now improved and simplified by the substitution of gas for oil, has completely set at rest all theoretic speculations on the subject. The light is not only by far the most brilliant, without distress to the eye, but is cheaper by two-thirds than the old wax candle plan of illumination. If I recollect properly, Mr. Gurney told me that the expense of using the Bude Light, in which naphtha is required, is about twelve times greater than that of common London gas, sizes of flame being equal; but that as the Bude flame gave twelve times more light, the expense was in reality the same, without the inconvenience of many burners, and a great consumption of air. The property of giving little heat, in comparison to what is produced by common gas, is in itself of great importance. Another useful property is, that the light may be varied in tone, from the most perfect white down to the red ray, by increasing or diminishing the quantity of oxygen."

INCONVENIENCES FROM ARTIFICIAL LIGHT.

We have now briefly to notice certain inconveniences

*Report of Committee on Lighting the House.

occasionally attending the employment of gas, as well as every other kind of artificial light in common use. There are, in the first place, headache, giddiness, and other unpleasant symptoms, which are sometimes complained of in small or ill-ventilated apartments where gas is burned. They may be justly attributed to the heat and carbonic acid produced during the combustion of the gas, although they also depend to some extent upon similar changes effected on the air of the room by respiration, and would occur even to a greater degree were common oil or candles employed, so as to give an equal amount of light. The remedy for the evil is simply *ventilation*. The other inconvenience is of a more insidious nature, and may be ultimately attended with even more serious consequences; we allude to the injurious effect of artificial light upon the organ of vision itself. It is well known that the eyes become fatigued and painful, and they are actually weakened for a time, by exposure to any object strongly illuminated. This may be proved by reading even for a few minutes with one eye tied up, and then comparing the power of vision of this eye with the other. It is also remarkable, that although illumination by artificial means be much less brilliant than daylight, its weakening effect upon the eye is perceived in a greater degree. For example, let the same experiment be repeated by candle or gas-light. The exposed eye will be found now to be more weak than in the former case. The sensibility of its nervous structure in these circumstances is actually impaired for a time, and requires a short period of rest to restore its power. If the eyes be habitually exposed to this stimulus for long periods without rest, as is often the case with literary men, and others, who work to late hours with artificial light, there is no doubt that a permanent weakness of the eyesight may be occasioned, which may even terminate in the destruction of the sensibility of the eye—a disease known by the term *amaurosis*, or nervous blindness.

The first intimations of these injurious effects are usually a sensation of heat and soreness of the eyelids, and pain of the eye-ball, particularly at night, when artificial light is used; in some cases there is an unusual degree of irritability of the eyes, followed by flashes of light when they are touched, or specks floating before them, and ultimately dimness of vision, so that a stronger and stronger light is required. These symptoms may arise from other causes; but it is certain that they are often produced or augmented by the injudicious use of strong artificial light, when minute objects are contemplated. Happily, they may be obviated to a great degree without difficulty. To effect this, the eyes should in the first place be protected from the direct rays of the light itself, not only by raising it above the object out of the line of the eye, but also by the use of a shade placed upon it, so as to prevent its rays from falling upon the face; a minute object is now seen more distinctly than before, even with a less amount of illumination. There is another method which may be adopted, and it has the advantage of being equally simple, though more philosophical. It is derived from the examination of the nature of light, and of the difference between daylight and that which is obtained from combustion. Sir Isaac Newton made the discovery, that light was not simple, but a compound of seven different coloured rays, such as are seen in the rainbow. More recent discoveries have reduced the number of simple rays to three—red, yellow, and blue—which exist in daylight in the following proportions, namely, red 5, yellow 3, blue 8. In artificial light the proportions are different, yellow and red preponderating to a great degree. Experiment proves that each of these rays can act separately upon the eye. For example, if the red ray only be admitted into it, as by looking at the sun through red glass, the nervous structure of the eye is for a time weakened to the stimulus of red; and when the uncovered eye is now turned to a white object, the other rays only are seen, namely, the yellow and blue, giving it a greenish tinge. If, again, the sun be looked at through a green glass, a white object seen immediately after will appear to be red, the eye being insensible to the complementary colours, yellow and blue. For a similar reason, when the eye, passing suddenly from daylight, views objects by means of a candle or gas, they appear of a yellowish hue; and, on the contrary, passing from artificial light into day, the whole prospect has a blue or purplish aspect.

It is also proved by experiment, that the red and yellow rays have a more weakening effect upon the eye than blue; hence, to a certain extent, the more injurious effect of artificial light, which, as already stated, contains those rays in excess. This fact at once suggests a method of obviating the bad effects of gas or candle light, which is either to make it pass through a blue glass shade, so as to obstruct a portion of the red and yellow rays, or to reflect down blue rays by placing a blue reflector above the light; in this manner the quality of artificial light is made more nearly to approach to that of the sun, and objects are seen by it of a purer white, and agreeably cool and refreshing to the eye.

For further information on this subject, we would strongly recommend a small volume by Dr. James Hunter, entitled, "On the Influence of Artificial Light in causing Impaired Vision."

PREVENTION OF SMOKE.

The smoke arising from the furnaces employed at factories has, within the last twenty or thirty years, been felt as a great nuisance in most manufacturing towns, polluting, as it does, the pure air of heaven, and begriming every exposed object within the range of its influence. Those employing furnaces have also become generally aware that smoke is only a volatile form of fuel, and that if either less of it were generated, or if, when generated, it could be consumed, there would be a great saving in the expense of raising steam. These circumstances have led to various devices for the combustion and prevention of smoke, the chief of which it is our duty to describe in this place.

IVISON'S PLAN FOR CONSUMING SMOKE.

This plan, the invention of Mr. Ivison of the silk factory, Fountainbridge, Edinburgh, and which is covered by a patent, consists in the projection of a stream of steam into the space between the fire and the boiler. It proceeds upon the theory, that, the steam so introduced being decomposed by the heat of the furnace, its oxygen unites with the carbon of the smoke, and causes the combustion of that material, while the hydrogen also burns through its own inflammable quality. The arrangement for the introduction of the steam is simple: a small iron pipe, proceeding from the top of the boiler, bends over and enters the furnace immediately above the door, the termination being fitted with a fan-shaped expansion full of small holes, by which the steam is dispersed throughout the fiery space. By a steam-cock on the pipe at the furnace door, the discharge can be regulated or altogether stopped. The due working of the apparatus depends on admitting into the furnace a certain quantity of hot air, and this is done through two pipes which, opening from the open air, pass into the furnace and out again, the inner terminations being inserted in the door.

With regard to the prevention of smoke, Mr. Ivison's plan seems to have established for itself a certain measure of success; but we have understood that the theory is extensively doubted, and that the plan is not likely to be universally adopted. At the silk factory, Edinburgh, at which it is professedly applied, large volumes of black smoke are still frequently seen, and this affords reason

to doubt its utility in general circumstances. The plan was tried on the furnace of the steam-boiler used in the office where this work is printed, and was found to be defeated, in consequence of the extremity of the steam-pipe being constantly liable to be destroyed by the fire. This difficulty may be obviated, and the whole benefit of the plan may, we believe, be secured, if the steam-pipe be introduced below the bars of the furnace, or the bottom ash-pit be kept constantly covered with water.

JUCKES'S PLAN.

Mr. Juckes's plan is designed for consuming smoke and economizing fuel. The following description of it was given by himself at the meeting of the British Association at Manchester, June, 1842. "His grate-bars are endless chains passing over rollers, and moved forward about an inch per minute. The coals employed are common siftings or screenings, which are heaped on the bars outside the furnace door, which slides upwards. The door is left a little open, and by passing under it, the small coal is spread uniformly over the bars. The air is constantly supplied through the bars directly to the fuel while burning, and in this way perfect combustion is obtained. The bars, being slowly moved on, carry the ashes to the ash-pit, which lies at the back of the grate. Clinkers are prevented from incrusting the bars, by their passing under a gauge, which effectually removes them; and the burning away of the bars is prevented by their constantly moving away from the hottest place. The bars or chains, with their rollers and driving-wheels, are fixed in a frame which can be completely drawn out from under the boiler, for the purpose of removing injured bars, or any other purpose. A boiler has been at work for two months at Mr. Baird's saw-mill, Wapping, and given great satisfaction. No smoke is ever seen, and the consumption of coal is only 12 cwt. per day, whereas, with the old boiler, they had used a ton of coal, besides a ton of wood and saw-dust."

SMITH'S NEW BOILER.

The principle of this boiler was suggested to Mr. Smith by a consideration of the upper and under currents in the ocean and in the air, often flowing in opposite directions. He has tried to avail himself of this principle in his furnace, considering that, from the great rapidity with which the gases leave the fire, it is impossible to effect their perfect incorporation with atmospheric air and consequent combustion; and believing that, when these gases are allowed to pass off directly through the flues in nearly straight lines, the gases and air pass along in separate threads or films, sufficient time for their proper mixture not being given under the ordinary systems of combustion. Mr. Smith, therefore, constructs a boiler and furnace in the following manner:—Beyond the bridge of the furnace, he places a chamber within the boiler entirely surrounded by the water; this chamber only leaves room for small water space along the sides and bottom of the boiler; it is arched elliptically, and of course, like all internal flues or fire-boxes, leaves sufficient space above for water and steam. The funnel or chimney is placed on the same side as the fire, and as low as possible. The hot gases and air rush over the bridge gradually, from the size of the chamber, losing their initial velocity. When they impinge against the opposite side of the chamber, the current is directed downwards; and the return current, with diminished velocity, flows back to the chimney under the stratum of gas and air issuing from the fire-bridge. In this way time is given for combustion, and the gases are inflamed or exploded before going up the chimney. From the chamber being quite within the boiler, nearly all the heat is made available. Mr. Smith considers his plan particularly applicable to marine boilers and reverberatory furnaces. He lately had one established at Messrs. Page and Grantham's, Liverpool, working an engine of ten horse power, the pressure in the boiler being 50 lbs. This did as much work with 8 cwt. of coal as the best tube boiler which these gentlemen ever tried had performed with 12 cwt.

WADDINGTON'S PATENT BOILER.

The chief novelty in this plan is a contrivance for introducing coal in a gradual manner. Put in at the sides of the boiler, it is made to descend inclined planes to the bars, before reaching which it is coked by the fuel burning on the bars, and smoke is prevented.

GREENWAY'S METHOD.

This is a plan of considerable ingenuity, as well as simplicity, for *consuming* smoke. He employs, in each case, two boilers and two furnaces. The furnaces are supplied with dampers, so that their communication with their respective flues can be cut off, and a communication opened between the two fires by an intermediate flue. When fresh coals are put on one fire, the damper of that fire is shut, and the intermediate flue opened, so that the smoke is obliged to descend through the bars, and ascend through the burning fuel of the other fireplace. By alternating this, as fresh coals are put on the fires, smoke is said to be prevented.

VARIOUS MINOR PLANS.

We here briefly notice a few plans of inferior note and likelihood, which have been recently brought before the world. Mr. *Kurtz's* is by hollow bars admitting fresh and heated air to a hollow bridge. Mr. *Samuel Hall's* is a plan of much the same nature, by air heated in a quantity of pipes in the flue between the boiler and the chimney, passing thence to perforations in or near the bridge. Mr. *John Chanter's* is by an "auxiliary boiler," the bars under which are inclined, and have below an iron plate termed a "deflector." At the lower end of this furnace a common furnace is constructed, which receives the coke or charred coal in an incandescent state from the upper bars. Mr. *R. Rodda's* is by a furnace divided into two parts, one for coking the coal, the other for receiving the coke—the gas from the coal passing through lateral openings into the second division, where they are to be destroyed by the bright fire. A stream of fresh air is admitted, joining the smoke in the passage, thus effecting its combustion.

It may here be remarked, that coal may be economized and the escape of its fumes much diminished, without any peculiar contrivances, simply by careful and skilful feeding of the furnace by the firemen. In Cornwall, where no contrivances exist, fuel is managed in such a way by the firemen that the consumption in general is only about 2¼ pounds per horse power per hour, and smoke is said to be "never seen." The coal is regularly weighed to the firemen, and the "duty" of the engines is reported every week. This excites emulation among the men, and when a falling off in their attention takes place, it is instantly detected. The great object held in view is to keep thin bright fires, coking the coal in front.

MR. C. W. WILLIAMS'S PLAN.

This is the plan most in esteem at present, and which seems most likely to prove generally serviceable. Mr. Williams is one of the oldest managing directors of the City of Dublin Steam Packet Company, and the author of a treatise entitled, "The Combustion of Coal, and the Prevention of Smoke, Chemically and Practically Considered." Though not by education and circumstances a man of science, his attention having been powerfully called to the subject, he has prosecuted his inquiries into it to at least scientific results, all of which have been vouched for by eminent practical chemists.

Mr. Williams aims not at burning the smoke, which he holds to be a chemical absurdity, but at preventing its

formation. "One of my objects," he says in his treatise, "is to show how the combustion of the volatile portions of coal may be effected as completely when issuing from the throat of a furnace as from the beak of a gas-burner." To pursue the explanations afforded in the Polytechnic Journal—"It is ascertained that 20 cwt. of bituminous coal affords about 10,000 cubic feet of coal-gas—some qualities more, some less; now, chemistry teaches that every measure of this gas requires for its perfect combustion ten measures of atmospheric air, thus making from a ton of coal a gaseous mixture of about 100,000 cubic feet. With more or with less air, we still have imperfect combustion. This is the whole theory of the process; it is what every chemist has long known, and no obstacle is offered to its solution or comprehension. How can so large a body of air as ten cubic feet to every single cubic foot of gas by any possibility be admitted, without cooling down the furnace? Opening the door would let in air enough, with the disadvantage of cooling the furnace and lowering the steam. The doctrine of the diffusion of gases, due to the elaborate and interesting experiments of Dr. Dalton, comes to our aid. For perfect diffusion, we require time; the process of the furnace will not afford time. We must, then, resort to some mechanical arrangement to overcome this difficulty in the simplest possible manner. Now, we may have enough of air; but from having it applied in the wrong mode, as is done in opening the door, though we lose the smoke, we lose the steam also; in this case it is somewhat like the two conditions of gas burnt from a common pipe with and without an argand burner. Why does it in the one situation smoke and give little heat, while in the other it is smokeless and intensely hot, seeing it is surrounded in both instances with an abundant supply of air? Merely because the numerous minute jets of gas, supplied by the argand burner, afford that more perfect diffusion refused by the wide bore of a single orifice. So, in the furnace, if we can admit the ten measures of air in the same way by means of small jets, we do all we want by obtaining rapid diffusion, complete mixture, and therefore perfect combustion."

In the "Practical Mechanic and Engineer's Magazine" for 1841, there is a paper on Mr. Williams's plan, illustrated by sections of the furnace and boiler. From this we learn that a long boiler is supposed, and that the grate is placed under one end, having its ash-pit below as usual. The fumes of the coal pass onward under the boiler, towards a chimney at the opposite extremity. Under the centre of the boiler, and quite separate from the ash-pit, there is a square chamber, having a flue by which air can be admitted from without. From the iron plate forming the roof of this chamber, three short vertical tubes, unclosed at the lower ends, project upwards into the space beneath the boiler along which the fumes pass. These tubes are perforated all round the sides and tops with holes of a quarter-inch, set one inch apart. The air, accordingly, passing first into the square chamber, then proceeds upwards, and rushes into the space above in the form of small jets. At every charge of fresh coal on the fire, the first product is, not smoke, but a very large body of crude impure coal-gas, the unconsumed portion of which, as it passes the bridge, meeting the air, mingles with it and instantly inflames, being encompassed with a hot gaseous atmosphere. The effect then is, that each jet of air seems to be a common gas flame, and these vertical tubes have not inaptly been compared to trees of fire. To those who are not familiar with the fact of flame from a jet of air in gas, it may be interesting to quote the observations of Professor Blande on this subject:—"I fill a bladder with coal-gas," says he, "and attach to it a jet, by which I burn a flame of that gas in an atmosphere of, or a bell-glass filled with, oxygen; of course the gas burns brilliantly, and we call the gas the combustible, and the oxygen the supporter of combustion. If I now invert this common order of things, and fill the bladder with oxygen, and the bell-glass with coal-gas, I find that the jet of oxygen may be inflamed in the atmosphere of coal-gas, with exactly the same general phenomena as when the jet of coal-gas is inflamed in the atmosphere of oxygen." Such are the means by which Mr. Williams *prevents* smoke. The saving of fuel is said to be about 25 per cent.

ARCHITECTURE.

Architecture, or the art of planning and raising edifices, appears to have been among the earliest inventions. The first habitations of men were such as nature afforded, with but little labour on the part of the occupant, and sufficient to supply his simple wants—grottos, huts, and tents. In early times, the country of Judea, which is mountainous and rocky, offered cavernous retreats to the inhabitants, who accordingly used them instead of artificial places of shelter. From various passages in Scripture, it appears that these caves were often of great extent, for, in the sides of the mountain of Engedi, David and 600 men concealed themselves. In the course of time, art was employed to fashion the rude cavernous retreats, and to excavate blocks by which rude buildings were composed in more convenient situations. The progress of architecture, however, from its first dawn, differed in almost every different locality. Whatever rude structure the climate and materials of any country obliged its early inhabitants to adopt for their temporary shelter, the same structure, with all its prominent features, was afterwards kept up by their refined and opulent posterity.

From the cause now mentioned, the Egyptian style of building had its origin in the cavern and mound; the Chinese architecture, with its pavilion roofs and pointed minaret, is moulded from the Tartar tent; the Grecian is derived from the wooden cabin; and the Gothic from the bower of trees. It is evident that necessity as much as choice or chance led to the adoption of the different kinds of edifices. Among a roving and pastoral people, the tent, which could be easily struck and removed, was obviously more suitable than an immovable and difficultly erected structure; it is equally clear that lofty and substantial edifices would be out of place in a country subject to earthquakes, or low buildings in situations liable to periodic inundation. Thus local circumstances everywhere produced local styles of architecture, and these distinctions are now almost as observable as they were thousands of years ago.

After mankind had learned to build houses, they commenced the erection of temples to their gods, and these they made still more splendid than private dwellings. Thus architecture became a fine art, which was first displayed on the temples, afterwards on the habitations of princes and public buildings, and at last became a universal want in society.

Traces of these eras of advancement in the art of erecting buildings are found in various quarters of the

globe, especially in eastern countries, where the remains of edifices are discovered of which fable and poetry can alone give any account. The most remarkable of these vestiges of a primitive architecture are certain pieces of masonry in the island of Sicily, as well as in some other places, called the works of the Cyclops, an ancient and fabulous race of giants, mentioned by Homer in his Odyssey. By whom these walls were actually erected is unknown.

Of the progressive steps from comparative rudeness to elegance of design, history affords no certain account, and we are often left to gather facts from merely casual notices. The most ancient nations known to us, among whom architecture had made some progress, were the Babylonians, whose most celebrated buildings were the temple of Belus, the palace and the hanging gardens of Semiramis; the Assyrians, whose capital, Nineveh, was rich in splendid buildings; the Phœnicians, whose cities, Sidon, Tyre, Aradus, and Sarepta, were adorned with equal magnificence; the Israelites, whose temple was considered as a wonder of architecture; the Syrians, and the Philistines. No architectural monument of these nations has, however, been transmitted to us; but we find subterraneous temples of the Hindoos, hewn out of the solid rock, upon the islands Elephanta and Salsette, and in the mountains of Elora. These temples may be reckoned among the most stupendous ever executed by man. The circuit of the excavations is about six miles. The temples are 100 feet high, 145 feet long, and 62 feet wide. They contain thousands of figures, appearing, from the style of their sculpture, to be of ancient Hindoo origin. Every thing about them, in fact, indicates the most persevering industry in executing one of the boldest plans. In the chief temple, the vault is supported by several rows of columns, which form three galleries, one above the other. Twenty-four colossal monolenthes, representing Indian gods, are placed in separate divisions, the sculpture of which, though on the whole rude, shows in some parts an advanced period of art, and a certain development of taste. Latterly, several travellers have made known the remains of an architecture and sculpture not very dissimilar to that of the ancient Hindoos, in certain districts of Central America, believed to be the execution of a people anterior to those Mexicans who existed at the period of the invasion of Cortes.

EGYPTIAN STYLE OF ARCHITECTURE.

All the architectural remains of ancient times sink into insignificance when compared with those of Egypt. The obelisks, pyramids, temples, palaces, and other structures of this country, are on the grandest scale, and such as could only have been perfected by a people considerably advanced in refinement. The elementary features of Egyptian architecture were chiefly as follows:—1. Their walls were of great thickness, and sloping on the outside. This feature is supposed to have been derived from the mud walls, mounds, and caverns of their ancestors. 2. The roofs and covered ways were flat, or without pediments, and composed of blocks of stone, reaching from one wall or column to another. The principle of the arch, although known to the Egyptians, was seldom if ever employed. 3. Their columns were numerous, close, short, and very large, being sometimes ten or twelve feet in diameter. They were generally without bases, and had a great variety of capitals, from a simple square block, ornamented with hierogiyphics or faces, to an elaborate composition of palm-leaves, not unlike the Corinthian capital. 4. They used a sort of concave entablature, or cornice, composed of vertical flutings, or leaves, and a winged globe in the centre. 5. Pyramids, well known for their prodigious size, and obelisks, composed of a single stone, often exceeding seventy feet in height, are structures peculiarly Egyptian. 6. Statues of enormous size, sphinxes carved in stone, and sculp- in outline of fabulous deities and animals, with innumerable hieroglyphics, are the decorative objects which belong to this style of architecture.

The main character of Egyptian architecture is that of great strength with irregularity of taste. This is observable in the pillars of the temples, the parts on which the greatest share of skill has been lavished. The following are examples:

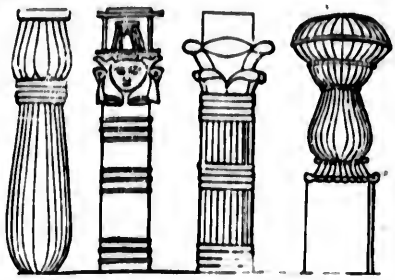


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

In these columns, we may notice that sturdiness is the prevailing characteristic. The desire has been the support of a great weight, and that without any particular regard to proportion or elegance either as a whole or in parts. When assembled in rows or groups, the columns had an imposing effect, because, from their height and thickness, they filled the eye and induced the idea of placid and easy endurance. In fig. 5, which represents the exterior of a temple, this simple and imposing character is conspicuous.

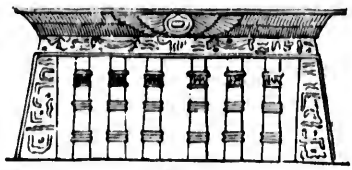


Fig. 5.

GRECIAN STYLE OF ARCHITECTURE.

From Egypt, the architectural art spread to Greece, where it passed from the gigantic to the chaste and elegant. The period during which it flourished in the greatest perfection was that of Pericles, about 440 years before Christ, when some of the finest temples at Athens were erected. After this, it declined with other arts, and was carried to Rome, where, however, it never attained the same high character. The Grecian temples were built chiefly of marble, and surrounded or decorated with columns, and had a pleasing effect when situated amidst groves of trees or other kinds of natural scenery; and as they were lighted from the roof, the beauty of the structures was not deformed by formal rows of windows, such as are now common in modern edifices. Before describing the various orders of Grecian and Roman architecture, it will be advantageous to explain the terms ordinarily employed in reference to the component parts of buildings.

Explanation of Terms.

The *front* or façade of a building, made after the ancient models, or any portion of it, may present three parts, occupying different heights:—The pedestal is the lower part, usually supporting a column; the single pedestal is wanting in most antique structures, and its place supplied by a *stylobate*: the stylobate is either a platform with steps, or a continuous pedestal, supporting a row

of columns. The lower part of a finished pedestal is called the *plinth*; the middle part is the *die*, and the upper part the *cornice* of the pedestal, or *surbase*. The *column* is the middle part, situated upon the pedestal or stylobate. It is commonly detached from the wall, but is sometimes buried in it for half its diameter, and is then said to be engaged. *Pilasters* are square or flat columns attached to walls. The lower part of a column, when distinct, is called the base; the middle, or longest part, is the shaft; and the upper or ornamented part, is the capital. The swell of the column is called the *entasis*. The height of columns is measured in diameters of the column itself, taken always at the base. The *entablature* is the horizontal continuous portion which rests upon the top of a row of columns. The lower part of the entablature is called the *architrave* or *epistylium*. The middle part is the *frieze*, which, from its usually containing sculpture, was called *zophorus* by the ancients. The upper or projecting part is the cornice. A *pediment* is the triangular face produced by the extremity of a roof. The middle or flat portion enclosed by the cornice of the pediment is called the *tympanum*. Pedestals for statues, erected on the summit and extremities of a pediment, are called *acroteria*. An *attic* is an upper part of a building, terminated at top by a horizontal line instead of a pediment. The different mouldings in architecture are described from their sections, or from the profile which they present when cut across. Of these, the *torus* is a convex moulding, the section of which is a semicircle, or nearly so; the *astragal* is like the torus, but smaller; the *ovolo* is convex, but its outline is only the quarter of a circle; the *echinus* resembles the ovalo, but its outline is spiral, not circular; the *scotia* is a deep concave moulding; the *cavetto* is also a concave, and occupying but a quarter of a circle; the *cymatium* is an undulated moulding, of which the upper part is concave and the lower convex; the *ogee* or *talon* is an inverted cymatium; the *fillet* is a small square or flat moulding. In architectural measurement, a diameter means the width of a column at the base. A module is half a diameter. A minute is a sixtieth part of a diameter.

In representing edifices by drawings, architects make use of the plan, elevation, section, and perspective. The plan is a map or design of a horizontal surface, showing the ichnographic projection, or groundwork, with the relative position of walls, columns, doors, &c. The elevation is the orthographic projection of a front, or vertical surface; this being represented, not as it is actually seen in perspective, but as it would appear if seen from an infinite distance. The section shows the interior of a building, supposing the part in front of an intersecting plane to be removed. The perspective shows the building as it actually appears to the eye, subject to the laws of scenographic perspective. The three former are used by architects for purposes of admeasurement; the latter is used also by painters, and is capable of bringing more than one side into the same view, as the eye actually perceives them. As the most approved features in modern architecture are derived from buildings which are more or less ancient, and as many of these buildings are now in too dilapidated a state to be easily copied, recourse is had to such initiative restorations, in drawings and models, as can be made out from the fragments and ruins which remain. In consequence of the known simplicity and regularity of most antique edifices, the task of restoration is less difficult than might be supposed. The groundwork, which is commonly extant, shows the length and breadth of the building, with the position of its walls, doors, and columns. A single column, whether standing or fallen, and a fragment of the entablature, furnish data from which the remainder of the colonnade, and the height of the main body, can be made out.

Grecian temples are well known to have been constructed in the form of an oblong square, or parallelogram, having a *colonnade* or row of columns without, and a walled *cell* within. The part of the colonnade which formed the front portico was called the *pronaos*, and that which formed the back part the *posticus*. There were, however, various kinds of temples, the styles of which differed; thus, the *prostyle* had a row of columns at one end only; the *amphiprostyle* had a row at each end; the *peripteral* had a row all round, with two inner ones at each end; and the *dipteral* had a double row all round, with two inner ones at each end, making the front three columns deep.

The theatre of the Greeks which was afterwards copied by the Romans, was built in the form of a horse-shoe, being semicircular on one side and square on the other. The semicircular part, which contained the audience, was filled with concentric seats, ascending from the centre to the outside. In the middle or bottom was a semicircular floor, called the *orchestra*. The opposite, or square part, contained the scene. Within this was erected, in front of the audience, a wall, ornamented with columns and sculpture, called the *scena*. The stage or floor between this part and the orchestra was called the *proscenium*. Upon this floor was often erected a movable wooden stage, called by the Romans *pulpitum*. The ancient theatre was open to the sky, but a temporary awning was erected to shelter the audience from the sun and rain.

Orders.

Aided, doubtless, by the examples of Egyptian art, the Greeks gradually improved the style of architecture, and originated those distinctions which are now called the "Orders of Architecture." By this phrase is understood certain modes of proportioning and decorating the column and its entablature. These were in use during the best days of Greece and Rome, for a period of six or seven centuries. They were lost sight of in the dark ages, and again revived by the Italians at the time of the restoration of letters. The Greeks had three orders, called the Doric, Ionic, and Corinthian. These were adopted and modified by the Romans, who also added two others called the Tuscan and Composite.

The Doric order.—This is the earliest of the Greek orders, and we see in it a noble simplicity on which subsequent orders were founded. Compared with the best of the Egyptian models, it exhibits a great advance in purity of taste. From the remains of ancient art, it is found that the Doric varies in its proportions. The column, in its examples at Athens, is about six diameters in height; but in those of older date, as those at Pæstum, it is only four or five. One of the most correct examples is that given in fig. 6. The shaft of the Doric column had no base, ornamental or otherwise, but rose directly from the smooth pavement or stylobate. It had twenty flutings, which were superficial, and separated by angular edges. The perpendicular outline was nearly straight. The Doric capital was plain, being formed of a few annulets or rings, a large echinus, and a flat stone at top called the *abacus*. The architrave was plain; the frieze was intersected by oblong projections called triglyphs, divided into three parts by vertical furrows, and ornamented beneath by *guttæ*, or drops. The spaces between the triglyphs were called *metopes*, and commonly contained sculptures. The sculptures, representing Centaurs and Lapithæ, carried by Lord Elgin to London, were metopes of the

Fig. 6.

Parthenon, or temple of Minerva, at Athens. The cornice of the Doric order consisted of a few large mouldings, having on their under side a series of square sloping projections, resembling the ends or rafters, and called *mutules*. These were placed over both triglyphs and metopes, and were ornamented on their under side with circular guttæ. The Romans, in adopting the Doric, greatly spoiled its simplicity and grandeur by unduly lengthening the shaft, and making other tasteless alterations. To have a just idea of the Doric, therefore, we must go back to the pure Grecian era. The finest

Fig. 7.—Façade of the Parthenon.

examples are those of the temple of Theseus, and the Parthenon (fig. 7) at Athens. The Parthenon, which is now a complete ruin, has formed a model in modern architecture. It was built by the architect Ictinus, during the administration of Pericles, and its decorative sculptures are supposed to have been executed under the direction of Phidias. The platform or stylobate consists of three steps, the uppermost of which is 227 feet in length and 101 in breadth. The number of columns is eight in the portico of each front, and seventeen in each flank, besides which there is an inner row of six columns, at each end of the cell. The proportional height of the columns is five diameters and 33 minutes, and they diminish thirteen minutes in diameter from bottom to top. The sculpture of the frieze represented the combats of the Centaurs and Lapithæ; those of the eastern pediment represented the fabulous birth of Minerva; and those on the western the contests between the goddess and Neptune for the right of presiding over the city. The building was destroyed by the explosion of a bomb-shell, during the siege by the Venetians in 1687.

Speaking of these splendid objects of art, a respectable writer observes:—"Of their effect it is impossible to form a competent idea without seeing one. And whence, it may be asked, does this interest arise? From their simplicity and harmony; simplicity, in the long unbroken lines which bound their forms, and the breadth and boldness of every part; such as the lines of the entablature and stylobate, the breadth of the corona, of the architrave, of the abaci, of the capitals, and of their ovalos also; in the defined form of the columns, and the breadth of the members of the stylobate; harmony, in the evident fitness of every part to all the rest. The entablature, though massive, is fully upborne by the columns, whose spreading abaci receive it, and transmit the weight downwards by the shafts, which rest on a horizontal and spreading basement; the magnitude of every part being determined by the capacity of the sustaining power. Besides graceful and elegant outline, and simple and harmonious forms, these structures possess a bewitching variety of light and shade, arising from the judicious contour and arrangement of mouldings, every one of which is rendered effective by the fluting of the columns, and the peculiar form of the columnar capital, whose broad square abacus projects a deep shadow on the bold ovalo, which mingles it with reflections, and produces on itself almost every variety. The play of light and shade, again, about the insulated columns, is strongly relieved and corrected by the deep shadows on the walls behind them; and in the fronts, where the inner columns appear, the effect is enchanting. For all the highest effects which architecture is capable of producing, a Greek peripteral temple of the Doric order is perhaps unrivalled."*

The Ionic order.—In this order the shaft begins to lengthen, and to possess a degree of ornament, but still preserving a great degree of simplicity of outline. In the best examples as represented in fig. 8, the column was eight or nine diameters in height. It had a base often composed of a torus, a scotia, and a second torus, with intervening fillets. This is called the Attic base. Others were used in different parts of Greece. The capital of this order consisted of two parallel double scrolls, called volutes, occupying opposite sides, and supporting an abacus, which was nearly square, but moulded at its edges. These volutes have been considered as copied from ringlets of hair, or perhaps from the horns of Jupiter Ammon. When a column made the angle of an edifice, its volutes were placed not upon opposite, but on contiguous sides, each fronting outwards. In this case the volutes interfered with each other at the corner, and were obliged to assume a diagonal direction. The Ionic entablature consisted of an architrave and

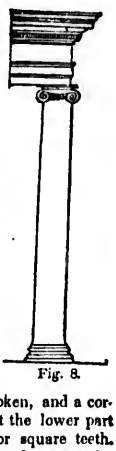


Fig. 8.

freize, which were continuous or unbroken, and a cornice of various successive mouldings, at the lower part of which was often a row of dentels, or square teeth. The examples at Athens of the Ionic order were the temple of Erectheus, and the temple on the Ilissus, both now destroyed. Modern imitations are common in public edifices.

The Corinthian order.—This was the lightest and most highly decorated of the Grecian orders. (Fig. 9.) The base of the column resembled that of the Ionic, but was more complicated. The shaft was often ten diameters in height, and was fluted like the Ionic. The capital was shaped like an inverted bell, and covered on the outside with two rows of leaves of the plant acanthus, above which were eight pairs of small volutes. Its abacus was moulded and concave on its sides, and truncated at the corners, with a flower on the centre of each side. The entablature of the Corinthian order resembled that of the Ionic, but was more complicated and ornamented, and had, under the cornice, a row of large oblong projections, bearing a leaf or scroll on their under side, and called *modillions*. No vestiges of this order are now found in the remains of Corinth, and the most legitimate example at Athens is in the choragic monument of Lysicrates. The Corinthian order was much employed in the subsequent structures of Rome and its colonies. The finest Roman example of this order is that of three columns in the Campo Vaccino at Rome, which are commonly considered as the remains of the temple of Jupiter Stator. This example has received the commendation of all modern artists, yet has seldom been executed in its original form. This is probably owing to the excessive richness and delicacy of it, which renders its adoption very expensive; and perhaps the modification of it by Vignola is preferable to the original, possessing a sufficient enrichment without the excessive refinement of the other. In this order the

Fig. 9.

* Encyclopædia Britannica, article *Architecture*.

base is one module in height; the shaft sixty modules twenty minutes; and the capital two modules ten minutes; thus giving ten diameters to the whole column. The architrave and frieze are each one module fifteen minutes in height, and the cornice two modules. The cornice is distinguished by modillions interposing between the bead mouldings and corona; the latter is formed by a square member surmounted by a cymatium, supported by a small ogee; the former is composed of dentels, supported by a cyma reversa, and covered by the ovalo. When the order is enriched, which is usually the case, these mouldings, excepting the cymatium and square of the corona, are all sculptured; the column is also fluted, and the channels are sometimes filled to about a third of their height with cablings, which are cylindrical pieces let into the channels. When the column is large, and near the eye, these are recommended as strengthening them, and rendering the fillets less liable to fracture; but when they are not approached, it is better to leave the flutes plain. They are sometimes sculptured, but this should only be in highly enriched orders.

The flutes are twenty-four in number, and commonly semicircular in their plan. The Corinthian base is similar to that of the Composite order, excepting that two astragals are employed between the scotiæ instead of one; but the Attic is usually employed for the reason before assigned.

"The Corinthian order," says Sir William Chambers, "is proper for all buildings where elegance, gayety, and magnificence are required. The ancients employed it in temples dedicated to Venus, to Flora, Prosperine, and the nymphs of fountains, because the flowers, foliage, and volutes with which it is adorned, seemed well adapted to the delicacy and elegance of such deities. Being the most splendid of all the orders, it is extremely proper for the decoration of palaces, public squares, or galleries and arcades surrounding them; and on account of its rich, gay, and graceful appearance, it may with propriety be used in theatres, in ball or banqueting rooms, and in all places consecrated to festive mirth or convivial recreation."

Caryatides.—The Greeks sometimes departed so far from the strict use of the orders as to introduce statues, in the place of columns, to support the entablature. Statues of slaves, heroes and gods, appear to have been employed occasionally for this purpose. The principal specimen of this kind of architecture which remains, is in a portico called Pandrosium, attached to the temple of Erectheus at Athens, in which statues of Carian females, called Caryatides, are substituted for columns. One of these statues has been carried to London.

ROMAN STYLE OF ARCHITECTURE.

Roman architecture possessed no originality of any value; it was founded on copies of the Greek models, and these were modified to suit circumstances and tastes. The number of orders was augmented by the addition of the Tuscan and Composite.

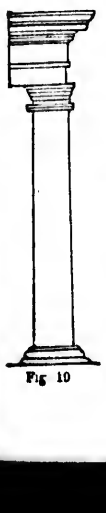


Fig. 10

Tuscan order.—This order is not unlike the Doric, and is chaste and elegant. As represented in fig. 10, the shaft had a simple base, ornamented with one torus, and an astragal below the capital. The proportions were seven diameters in height. Its entablature, somewhat like the Ionic, consisted of plain running surfaces. There is no vestige of this order among ancient ruins, and the modern examples of it are taken from the descriptions of Vitruvius. The general effect is strength with simplicity, and the order is considered to be well adapted for such buildings as prisons, public halls, and inferior parts of edifices.*

The Composite order.—Of this there were various kinds differing less or more either in the ornaments of the column or in the entablature. The simplest of this hybrid order was that which we represent in fig. 11, which may be observed to combine parts and proportions of the Doric, the Ionic, and the Tuscan. From this handsome modification of previous orders, the Romans advanced to the ornamental composite, represented in fig. 12, which, in point of fact, is a barbarously modified Corinthian. It would appear from these efforts, as well as from all subsequent attempts, that the Greeks attained the highest state of improvement of which their style was susceptible, and that, consequently, all schemes to execute something better must prove abortive. The higher class of Roman architects were convinced of this fact, and very judiciously held to the Corinthian order in all their finest buildings, both in Rome and in the provinces. Thus the Corinthian prevails among the ruins of Palmyra and Balbec, and other great cities founded by Roman provincials.

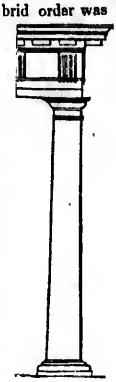


Fig. 11.

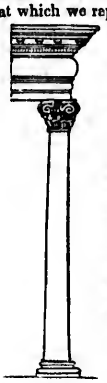


Fig. 12.

The temples of the Romans sometimes resembled those of the Greeks, but often differed from them. The Pantheon, which is the most perfectly preserved temple of the Augustan age, is a circular building, lighted only from an aperture in the dome, and having a Corinthian portico in front. The amphitheatre differed from the theatre, in being a completely circular or rather elliptical building, filled on all sides with ascending seats for spectators, and leaving only the central space, called the *arena*, for the combatants and public shows. The Coliseum is a stupendous structure of this kind. The aqueducts were stone canals, supported on massive arcades, and conveying large streams of water for the supply of cities. The triumphal arches were commonly solid oblong structures, ornamented with sculptures, and open with lofty arches for passengers below. The edifice of this kind most entire in the present day is the triumphal arch of Constantine, at Rome, represented in fig. 13. This structure is ornamental, and far from inelegant, but it contains much that is tasteless, inasmuch as being without meaning; and there is also an undue overloading of embellishment, or at least frittering away in details. Carrying the eye up the columns, and dissecting their individual bearings, we perceive that each may be resolved into the shafting represented on a larger scale in fig. 14, which is evi-

Fig. 13.

* Vitruvius was a celebrated writer on architecture, who is supposed to have flourished in the time of Julius Cæsar and Augustus. His treatise on architecture was first printed at Venice in 1497. An English translation appeared in 1771. A new translation by Wilkins was published in 1812.

dently anomalous in design, and inconsistent with the dignified simplicity of the pure Grecian models. The arch of Constantine has been copied at Paris, in the structure erected by Napoleon in front of the Tuileries.

The *basilica* of the Romans was a hall of justice, used also as an exchange or place of meeting for merchants. It was lined on the inside with colonnades of two stories, or with two tiers of columns, one over the other. The earliest Christian churches at Rome were sometimes called *basilicæ*, from their possessing an internal colonnade. The monumental pillars were towers in the shape of a column on a pedestal, bearing a statue on the summit, which was approached by a spiral staircase within. Sometimes, however, the column was solid. The *thermæ*, or baths, were vast structures, in which multitudes of people could bathe at once. They were supplied with warm and cold water, and fitted up with numerous rooms for purposes of exercise and recreation.

Fig. 14.

ITALIAN STYLE OF ARCHITECTURE.

After the dismemberment of the Roman empire, the arts degenerated so far that a custom became prevalent of erecting new buildings with the fragments of old ones, which were dilapidated and torn down for the purpose. This gave rise to an irregular style of building, which continued to be imitated, especially in Italy, during the dark ages. It consisted of Grecian and Roman details, combined under new forms, and piled up into structures wholly unlike the antique originals. Hence the names Græco-Gothic and Romanesque architecture have been given to it. After this came the *Italian style*, which was professedly a revival of the classic styles of Greece and Rome, but adapted to new manners and wants—a kind of transition from ancient to modern times. Its great master was Andrea Palladio, a Venetian (born 1518—died 1580). This highly accomplished man expelled much of the Græco-Gothic taste, and established in the sixteenth century what may be called a new era in architecture. The majestic simplicity of the ancient orders was always present to the mind of Palladio, and he has left behind him many beautiful buildings which attest the purity of his taste. The writer in the "Encyclopædia Britannica," already referred to, alludes to some peculiarities of the Italian style:—

"Prostyles being almost unknown in Italian architecture, antæ are not often required. Pilasters, however, are very common—so common, indeed, that they may be called pro-columns, as they are often used as an apology for applying an entablature. They are described as differing from columns in their plan only, the latter being round, and the former square; for they are composed with bases and capitals; they are made to support entablatures according to the order to which they belong, and are fluted and diminished with or without entasis, just as columns of the same style would be. When they are fluted, the flutes are limited to seven in number on the face, which, it is said, makes them nearly correspond with the flutes of columns; and their projection must be one-eighth of their diameter or width when the returns are not fluted; but if they are, a fillet must come against the wall. Pedestals are not considered by the Italo-Vitruvian school as belonging to the orders, but they may be employed with them all, and have bases and surbases or cornices to correspond with the order with which they may be associated. Following Vitruvius, the Italian school makes the central intercolumniation of a portico wider than any of the others. Arched openings, in arcades or otherwise, are generally about twice their width in height; if, however, they are arranged with a columnar ordinance, having columns against the piers, they are made to partake of the order to which the columns belong, being lower in proportion to their width with the Tuscan than with the Doric, and so on; and the piers are allowed to vary in the same manner, from two-fifths to one-half of the opening. With columnar arrangements, moulded imposts and archivolts are used; the former being made rather more than a semi-diameter of the engaged columns in height, and the latter exactly that proportion. (Fig. 15.)

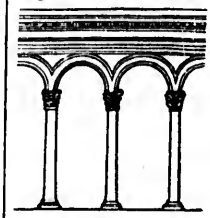


Fig. 15.

Variously moulded key-stones are also used, projecting so that they give an appearance of support to the superimposed entablature. Smaller columns with their entablature are sometimes made to do the duty of imposts, and sometimes single columns are similarly applied; at others, columns in couples are allowed to stand for piers to carry arches. In plain arcades, the masonry is generally rusticated, without any other projection than a plain blocking course for an impost, and a blocking course or cornice crowning the ordinance. Niches and other recesses are at times introduced in the plain piers, which are in that case considerably wider than usual, or in the spandrels over wide piers. Very considerable variety is allowed in these combinations, which will be best understood by reference to the examples. Doors and windows, whether arched or square, follow nearly the same proportions, being made, in rustic stories, generally rather less than twice their width in height, and in others either exactly of that proportion, or an eighth or a tenth more. If they have columned or pilastered frontispieces, these are sometimes pedimented; and, except in rustic stories, whether with or without columns, a plain or moulded lining, called an architrave, is applied to the head and sides of a door or window. This architrave is made from one-sixth to one-eighth the width of the opening it bounds, and it rests on a blocking course or other sill, as the case may be.

The rule for the form, composition, and application of pediments in Italian architecture, if it may be gathered from the practice of the school, appears to be to set good taste at defiance in them all. We find pediments of every shape, composed of cornices, busts, scrolls, festoons, and what not, and applied in every situation, and even one within another, to the number of three or four, and each of these of different form and various composition. The proportion laid down for the height of a pediment is from one-fourth to one-fifth the length of its base, or the cornice on which it is to rest. Balustrades are used in various situations, but their most common application is in attics or as parapets, on the summits of buildings, before windows, in otherwise close continued stereobates, to flank flights of steps, to front terraces, or flank bridges. Their shapes and proportions are even more diversified than their application; that of most frequent use is shaped like an Italian Doric column, compressed to a dwarfish stature, and consequently swollen in the shaft to an inordinate bulk in the lower part, and having its capital, to the hypotrachelium, reversed to form a base to receive its grotesque form. The base and coping cornice of a balustrade are those of an ordinary attic, or of a pedestal whose dado may be pierced into balusters. The general external proportions of an edifice, when they are not determined by single columnar ordinances, appear to be unsettled.

There is considerable variety and beauty in the foliate and other enrichments of an architectural character in many structures in Italy, but very little ornament enters into the columnar composition of Italian architecture. Friezes, instead of being sculptured, are swollen; the

shafts of columns are very seldom fluted, and their capitals are generally poor in the extreme; mouldings are indeed sometimes carved, but not often; rustic masonry, ill-formed festoons, and gouty balustrades, for the most part supply the place of chaste and classic ornaments.

THE CHINESE STYLE.

The ancient Tartars and wandering shepherds of Asia appear to have lived from time immemorial in tents, a kind of habitation adapted to their erratic life. The Chinese have made the tent the elementary feature of their architecture; and of their style any one may form an idea, by inspecting the figures which are depicted upon common China ware. Chinese roofs are concave on the upper side, as if made of canvas instead of wood. A Chinese portico is not unlike the awnings spread over shop windows in summer time. The verandah, sometimes copied in dwelling-houses, is a structure of this sort. The Chinese towers and pagodas have concave roofs, like awnings, projecting over their several stories. A representation of this barbaric style of erection is given in fig. 16. Such structures are built with wood or brick; stone is seldom employed.

Fig. 16.

THE SARACENIC, MOORISH, AND BYZANTINE STYLES.

The Arabs, or Saracens, as they are more usually called, and the Moors, introduced into Spain certain forms of architecture which differed considerably from the Grecian in appearance, though founded on its remains in Asia and Africa. The chief peculiarity of this architecture was the form of the arch; the Saracens are understood to have made it of greater depth than width, thus constituting more than half a circle or ellipse, and therefore unphilosophical and comparatively insecure (fig. 17); while the Moorish style was principally distinguished by arches in the form of a horse-shoe, or a crescent. The Saracens and Moors, however, were so much one people that the works of each are not easily pointed out in the present day; both styles were highly ornamented with flowery tracery, called *arabesque*, and the pillars supporting the arches were generally slender and elegant. The crescent-like or bulging dome of the oriental mosque was likewise introduced by the Moorish architects into Europe. This bulging, or onion-shaped form of dome, is common in the church-spires of the Netherlands, having been brought thither by the Spaniards when in possession of the country.

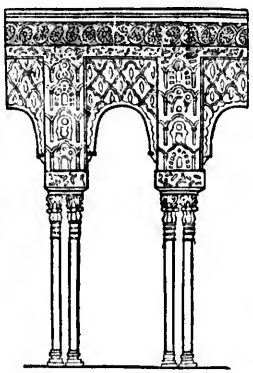


Fig. 17.

We associate with these styles another, which arose at Constantinople, called the Byzantine, likewise formed on the remains of Grecian art, and partaking of a slightly eastern character. It became known in western Europe along with the Lombard, another degenerate Grecian style, about the ninth and tenth centuries. The two united received the name of the Lombard-Byzantine, and were employed upon the cathedrals of Worms and Mayence, and several other ecclesiastical structures in Germany. This style is distinguished by small arches resting on connecting central pillars, like the Saracenic, and sometimes there are rows of such arches one above another. Either pure or mixed, the Byzantine style remained in vogue till it was superseded by the modern Gothic or German style, about the middle of the thirteenth century.

SAXON STYLE.

Many centuries before the Gothic or German style became known, a peculiar modification of the Grecian, since entitled the *Saxon style*, was invented and used in ecclesiastical edifices, and, as generally believed, led to the discovery of the Gothic. The Saxon style is distinguished by rounded arches over doors and windows, or in the entablature of turrets and walls. Sometimes the arch was composed of semicircles of different widths, swelling from a small to a larger compass, and thus affording a convenient entrance to porches in churches. An example is presented in fig. 18.

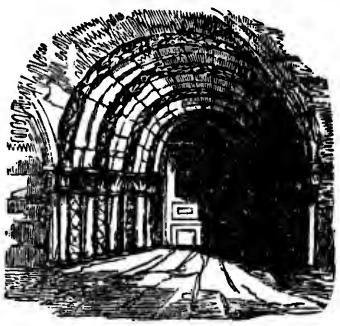


Fig. 18.

This style commenced at the establishment of Christianity among the Saxons in the sixth century, and is called Saxon, from its having prevailed during the reigns of the Saxon and Norman kings in England. Some of the finest specimens extant are the entrance to the Temple Church, London; the Abbey Gate, Bristol; and the church of Ramsey in Hampshire. The style continued in England till about the year 1135, in the reign of king Stephen.

GOTHIC OR POINTED STYLE.

The term Gothic is a modern error, which, being now impossible to correct, is suffered to remain as the generally distinguishing appellation of the kind of architecture possessing pointed arches. This style originated in Germany about the middle of the thirteenth century, and was zealously pursued as the leading fashion for ecclesiastical structures all over Europe. Executed by a class of skilled artisans, who wandered from country to country,* the finest specimens of the pointed style are the

* We here allude to the order or craft of Free-Masons, the origin of whose associations may be dated from the ninth or tenth centuries, and who attained their greatest numerical strength and importance at the introduction of the Gothic or pointed style of architecture. Afterwards, the order became a speculative society, unconnected with the practice of architecture, and finally has sunk before the spread of universal intelligence and a common philanthropy which recognises all men as brothers.

cathedrals of Strasburg, Cologne, and Antwerp, and the splendid abbeys of Melrose and Westminster. (Fig. 19.)

In this fanciful and picturesque style of architecture, the slender columns, always united in groups, rise to a lofty height, resembling the giants of the grove, in whose dark shade the ancient Teuton used to build his altar. In the obscure depth of the dome, the mind is awakened to solemn devotional feelings. The decoration of the ancient Christian churches is by no means an accidental ornament. They speak a figurative religious language; and at the tabernacle or cherubim, over the altar, where the pyx is kept, the whole temple is presented in miniature to the view of the beholder. In these edifices,

Fig. 19.

every one must admire the accurate proportions, the bold yet regular construction, the unwearied industry, the grandeur of the bold masses on the exterior, and the severe dignity in the interior. We must therefore ascribe to the German architecture more symbolical than hieroglyphic eloquence and dignity.

In England, the transition from the Saxon to the pointed style of arch is observed on various old buildings. The accidental intersection of rounded Saxon arches with each other, produces sharp points at the intersections, and this is believed by some to have been the origin of the pointed forms. The crossings of the boughs of trees in an avenue also afford a familiar illustration of the same fact. In the Temple Church the two arches may be found united, and other specimens may be seen in the Church of St. Cross near Winchester; and Fountains Abbey, Rivaulx Abbey, and Roche Abbey, in Yorkshire.

Fig. 20.

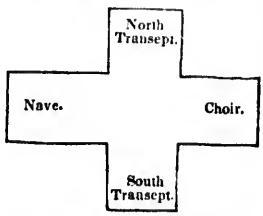
When the circular arch totally disappeared in 1220, the early English style commenced. The windows of this style were at first very narrow in comparison with their height; they were called lancet-shaped, and were considered very elegant: two or three were frequently seen together, connected by dripstones. In a short time, however, the windows became wider, and divisions and ornaments were introduced. Sometimes the same window was divided into several lights, and frequently finished at the top by a light in the form of a lozenge, circle, trefoil, or other ornament. A specimen of this kind may be seen in the beautiful church of St. Saviour's, Southwark, which has lately been thrown open to view by the improvements connected with the erection of the New London Bridge: and another and a very beautiful example in the "Lady Chapel," near London Bridge, on the Surrey side of the Thames. A specimen of the pointed or Gothic doorway is offered in fig. 20.

About the year 1300, the architecture became more ornamental, and from this circumstance received the name of the decorated English style, which is considered the most beautiful for ecclesiastical buildings. The windows of this style are very easily distinguished; they are large and wide, and are divided into several lights by mullions, which are upright or perpendicular narrow columns, branching out at the top into tracery of various forms, such as trefoils, circles, and other figures. York Cathedral affords a fine specimen of this sort of architecture, and there is a beautiful window of the same style in the south transept of Chichester Cathedral. The west front of that of Exeter is another specimen, and the doorway of Lincoln Cathedral is in the same style.

The transition from the decorated to the florid or perpendicular style was very gradual. Ornament after ornament was added, till simplicity disappeared beneath the extravagant additions; and about the year 1380, the architecture become so overloaded and profuse, that it obtained the title of florid, which by some persons is called the perpendicular, because the lines of division run in upright or perpendicular lines from top to bottom, which is not the case in any other style. King's College Chapel, Cambridge, begun in the reign of Henry VI., though not finished till some time after; Gloucester Cathedral; Henry VII.'s Chapel at Westminster; St. George's Chapel at Windsor; Wrexham Church, Denbighshire; and the Chapel on the bridge at Wakefield, Yorkshire—are all of this character. Many small country churches are built in this style; and their size not admitting of much ornament, they are distinguished from structures of a later date by mouldings running round their arches, and generally by a square head over the obtuse-pointed arch of the door. A peculiar ornament of this style is a flower of four leaves, called, from the family reigning at that period, the Tudor flower.

Definitions of Parts.

Gothic architecture being for the most part displayed in ecclesiastical edifices, it may be of service to explain the usual plan of construction of these buildings. A church or cathedral is commonly built in the form of a cross, having a tower, lantern, or spire, erected over the place of intersection. The part of the cross situated towards the west is called the *nave*. The opposite or eastern part is called the *choir*, and within this is the *chancel*. The transverse portion, forming the arms of the cross, is called the *transept*, one limb being called the northern, and the other the southern transept.



Generally, the nave is larger than the choir. If the nave, choir, and transepts be all of the same dimensions

the form is that of a Greek cross. When the nave is longer than the other parts, forming a cross of an ordinary shape, the edifice is said to be in the form of a Latin cross. The different open parts usually receive the name of *ailes* or *aisles*, from a word signifying a wing: the nave or largest open space is called the main aisle. Originally, the floors of all such edifices were open and unencumbered with fixed pews or seats, and as the floors were ordinarily of mosaic or tesselated pavement,* the effect was exceedingly grand.

The roofing of Gothic churches is of stone, in the form of *groins*, in which the arches are poised with intersecting points, and the whole skilfully adjusted so as to bear on the side rows of pillars (fig. 21). Any high building erected above the roof is called a *steeple;* if square topped, it is a *tower;* if long and acute, a *spire;* and if short and light, a *lantern*. Towers of great height in proportion to their diameter are called *turrets*.

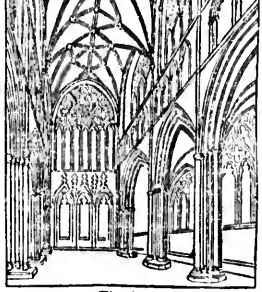


Fig. 21.

The walls of Gothic churches, on which the outer strain of the roof arches ultimately rests, require to be of great strength; and the imparting this necessary degree of resistance without clumsiness is the glory of this style of architecture. The plan adopted is to erect exterior *buttresses* (fig. 22). These rise by gradations from a broad basis to narrow pointed *pinnacles*, and, placed opposite the points of pressure, secure, without the slightest appearance of clumsiness, the general stability of the building. Slanting braces, which spring from the buttresses to the upper part of the roof, are called *flying* buttresses; such, however, are not always required in those modern edifices in which the roof is of wood and lead.

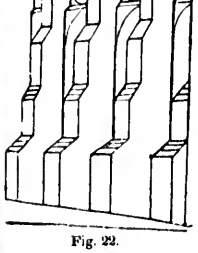


Fig. 22.

The summit or upper edge of a wall, if straight, is called a *parapet;* if indented, a *battlement*. Gothic windows were commonly crowned with an acute arch; they were long and narrow, or, if wide, were divided into perpendicular lights by *mullions*. The lateral spaces on the upper and outer side of the arch are called *spandrelles;* and the ornaments in the top, collectively taken, are the *tracery*. An *oriel*, or *bay window*, is a window which projects from the general surface of the wall. A *wheel*, or *rose window*, is large and circular. A *corbel*, is a bracket or short projection from a wall, serving to sustain a statue or the springing of an arch. The Gothic term *gable* indicates the erect end of a roof, and answers to the Grecian pediment, but is more acute.

Fig. 23.

The polished taste of the architects employed in constructing Gothic edifices, led to numerous devices in the form of the pillars Sometimes the column was single, round, and massive; at other times it was composed of seemingly a cluster of smaller pillars, and this had always the lightest effect; but occasionally the column was given the appearance of two shafts twisted, as represented in fig. 23, or of a single shaft with a festoon of flowers twined spirally around it. In the collegiate church at Roslin, there are some highly ornamented pillars of this kind.

The Gothic style of building is more imposing, and more difficult to execute than the Grecian. This is because the weight of its vaults and roofs is upheld at a great height by supporters acting at single points, and apparently but barely sufficient to effect their object. Great mechanical skill is necessary in balancing and sustaining the pressures; and architects at the present day, hampered by principles of economy, find it difficult to accomplish what was achieved by the builders of the middle ages.

NORMAN, TUDOR, AND MODERN GOTHIC.

Throughout England may be seen many aged castles, some still in a state of good preservation, but the greater number in ruins, and occupying, with their picturesque remains, the summit of a rising ground or rocky precipice. These castles are of a style which prevailed during the feudal ages in Europe, and was brought to this country by the Normans, who erected them as fastnesses into which they might retire and oppress the country at pleasure. The same kind of buildings are seen in Scotland, where the barons ruled with the same feudal power as in the southern parts of the island.

The feudal castles in England, like those on the Rhine, consisted for the most part of a single strong tower or keep, the walls of which were from six to ten feet thick, and the windows only holes of one or two feet square, placed at irregular intervals. The several floors were built on arches, and the roof was flat or battlemented, with notches in the parapet, from which the inhabitants or retainers of the chieftain might defend themselves with instruments of war. The accommodations for living were generally mean, and what would now be called uncomfortable. Around or in front of the main tower there was usually a court-yard, protected by a high wall, and the arched entrance was carefully secured by a falling gate or portcullis. Outside, there was in many cases a regular wet ditch or fosse. Castles of greater magnitude consisted of two or more towers and inner buildings, including a chapel and offices for domestics, and horses and other animals. Some of them were on a great scale, and possessed considerable grandeur of design.

As society advanced, and civil tranquillity was established, these military strengths gradually assumed a character of greater elegance and less the appearance of defence. The wet ditch disappeared, and was superseded by a lawn or shrubbery. Instead of the drawbridge and portcullis, there was a regular approach and gate of ordinary construction. The windows became larger, and were fitted with glass frames, and stone was abandoned for the greater comfort of wooden floors. Instead, also, of a bare region around, in which no foe might lurk, gardens were established, and a long avenue of trees led to the front of the modernized mansion. In some instances, the popper-box turrets at the upper cor-

* Mosaic, or more properly *Musaic* (from the Latin *opus Musivum*), was of Roman origin. It consisted of pavement formed of pieces of marble of different colours, arranged in a tasteful manner, and was very costly.

ners of the building remained. Of the class of structures that sprung up in this period of transition, which we may refer in England to the fifteenth and sixteenth, and in Scotland to the seventeenth centuries, there are several highly interesting remains. These edifices of the nobility and gentry were no longer called castles: they took the name of *halls*, and such had attained so great a pitch of magnificence in the reigns of Henry VIII. and Elizabeth, as to have subsequently given a name to a new style—the *Tudor* or *Elizabethan*. Latterly, and with no very distinct reference to any particular period, this remarkable fashion of building has been pretty generally called the *old English* style of architecture. One of the best existing specimens of the Tudor era of architecture is Hadden Hall in Derbyshire, the property of the Duke of Rutland.

A writer in the "Quarterly Review," speaking of this species of architecture, takes occasion to notice that "in a few of the houses built during the reign of Henry VIII., we may observe some slight traces of the Italian architecture, which in the next reign was more liberally introduced, and mixed up with the original Tudor, or early English, into an irregular, certainly, but in most instances an exceedingly rich and effective composition." This was traceable to the influence of the Italian architects in England, whose "fame was a subject of deep interest in this country, where the rage for building was no less strong and general than in Italy. In the brilliant reign of Elizabeth, the English nobles and princely proprietors vied more than ever with each other in the magnificence of their mansions. It might have been supposed that the noble Tudor houses, with their panelled walls, buttresses, and battlements, traceried windows, sculptured drip-stones, florid pinnacles, and embossed chimney-shafts, were sufficiently rich and gorgeous to satisfy the prevailing taste for splendour; but in their anxiety to strike and surprise the admiration of their countrymen, many deserted the native styles, and sought for designs, and even artists, from abroad. Italian architecture became, by degrees, the mode; and even where the indigenous style was adhered to in the general design, many of the enrichments and ornamental features were borrowed from the Italian. First of all, the porch or gateway, as the most conspicuous points on which to exhibit these exotic novelties, were decorated on each side of the entrance, and, perhaps, a second or third story above, with pilasters belonging to the different Greek orders; the doorway itself exchanged the low-pointed or Tudor for the circular arch; the deep, elegant, and sweeping Gothic mouldings for the Vitruvian architecture, cut across by the awkward projecting imposts. Next was introduced the cupola, whose invention in Italy had made so much noise, that it appears our country squires were anxious to have miniature specimens of it at home. It was applied as a covering to the high turrets, round, square, or polygonal, which flanked the entrance or terminated the angles of the building, and, surmounted with gilded vanes, certainly produced a rich and imposing effect. Then followed the removal of the panelled battlements, and the substitution of a parapet, carved into fantastic notches or scrolls, or perforated with oval openings, and ornamented with obelisks, balls, busts, statues, and other singular decorations. These ran up the gables, which were often twisted into strange shapes, and sometimes wholly replaced by the level balustrade; and thus the most characteristic features of the old style —its numerous steep gables and spiry pinnacles—were succeeded by the uniform horizontal straight lines of the new. At length the whole building was surrounded by columns or pilasters, rising tier above tier, to the exhaustion sometimes of the five orders; open arcades took the place of the entrance porch; and nothing remained of the Tudor style but the mullioned window, which, however was of itself sufficient to give a peculiarly picturesque and old-fashioned aspect to the whole building."

"It has always appeared to us," continues our authority, "that this architecture of the Elizabethan age constitutes a style of its own—a compound of two extremely different modes, the Italian and the Tudor Gothic. It is evident that the Italian design was always greatly altered to suit the climate and the taste of England. Indeed, were we not afraid that the comparison might be considered profane, we should say there is something in the rich irregularity of the Elizabethan architecture, its imposing dignity, gorgeous magnificence, and quaint and occasionally fantastic decoration, reminding us of the glorious visions that flitted across the imagination of Shakspeare, the immortal bard of the same age. He, like the architects of his day, borrowed largely from the foreigner, but made his importations appear exclusively his own. The architectural garden, which always accompanied this style of mansion, is not the least pleasing part of it. We delight in its wide and level terraces, decorated with rich stone balustrades, and these again with vases and statues, and connected by broad flights of stone steps—its clipped evergreen hedges—its embowered alleys—its formal yet intricate parterres, full of curious knots of flowers—its lively and musical fountains —its steep slopes of velvet turf—its trim bowling-green —and the labyrinth and wildness which form its appropriate termination, and connect it with the ruder scenery without. This kind of ornamental garden came from Italy, with the change we have been discussing in domestic architecture.

"The quadrangular embattled mansion of the last Henries affords scope for the display of much grandeur and magnificence, and adapts itself more conveniently to the plan of a modern house. The carved oriel, and deep many-lighted bay window, often projecting in a multitude of capricious angles and curves, besides the regular octagon, the panelled angled-turrets, with richly embossed finials, and the wreathed chimney-shafts, are characteristic beauties of this class of building. The gabled manor-house, together with these ornamental features, admits at the same time of a much greater irregularity of form and outline, so as to accommodate itself to every variety of disposition, and to buildings of every size, from the baronial residence to the parsonage and grange. All the forms which particularly mark the Elizabethan style, may be wrought in the cheapest materials with comparatively little labour; and a small portion of ornamental work, tastefully disposed, is capable of producing very considerable effect. Lastly, the Elizabethan house is distinguished by the number and size of its rectangular and many-mullioned windows, which gave a peculiar lightness and elegance to its several parts. The roof-line may be either horizontal or broken with gables, turrets, and cupolas. In either case, it is enriched with perforated parapets, balustrades, or other architectural devices, while similar embellishments ornament the entrance, and the terraces which connect the building with the garden."

Fortunately, this light and elegant style of domestic architecture is gradually superseding the bald Græco-Italian style of the eighteenth century. A better taste is evidently extending itself, particularly as regards the erection of villas, cottages, hunting-seats, gate-lodges and other rural residences. To these the old English style is peculiarly well adapted. The leading feature of this style applied to cottages is the dispensing with unbroken lines. The house is composed of different parts projecting at right angles from each other, with also a projecting porch, and the outshot octagonal window commanding views in three different directions. It also sometimes exhibits an open rustic arcade along a portion of the front or back, which will be found useful as agreeable both in sultry and cold broken weather. It

not uncommon for a cottage of this kind to have on the ground-floor two parlours, communicating by folding-doors, fourteen feet by twelve each, and ten feet in height; a kitchen and scullery, with a porch seven feet by five feet six inches, opening to a staircase seventeen feet six inches by eight feet, with three rooms above. The gables are enriched with pendants and ornamental dressings to the doorways and windows, and handsome octagonal chimney-stalks. We offer a representation of a cottage in this elegant style in fig. 24.

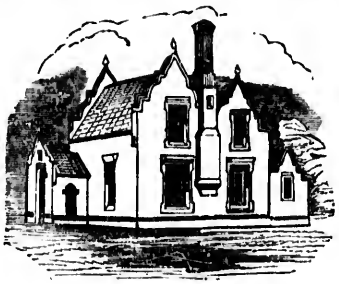


Fig. 24.

In erecting ornamental cottages of this kind, there ought to be a lightness in the pointing of the upper projecting windows, with a sharp angularity in the roof; and the chimney-stacks ought to stand well out, in order to create effect in different points of view. When the little gardens adjacent are well trimmed and blooming, and the woodbine and ivy trained round the porch or mullioned window, the prospect exhibited is such as it would be impossible to surpass in rural elegance. We have not here room to enlarge on this interesting topic, and must conclude by recommending that, in applying cottage architecture to a residence, much care ought to be taken to preserve the simplicity of the component parts, or the idea of the cottage will be lost in the magnitude of the dwelling. Loudon's Encyclopædia of Cottage and Villa Architecture should certainly be consulted by gentlemen and others in the country, before fixing on the style or mode of construction of their residences—that is to say, when skilful architects are not employed.

Fig. 25.

Improvement is also shown in the style of church-building, particularly in the northern part of the United Kingdom, where there was most room for it. Since the Reformation, churches have been built in Scotland with very little regard to elegance; and in the last century, particularly, there flourished a style, the products of which are scarcely to be distinguished from barns and granaries. Within the last twenty years, very few such structures have been erected without an effort being made to unite some degree of taste with a regard for convenience. A modest Gothic style has become very prevalent, which, though not always free of faults, is a surprising advance upon the homely edifices of the last century.

In fig. 25, a representation is given of one of these improved ecclesiastical structures, suitable for a rural scene, or any other situation in which economy of means requires to be consulted. In general, these handsome Gothic churches are calculated to accommodate from a thousand to twelve or fourteen hundred sitters, are neatly fitted up with pews and galleries, and cost from three to four thousand pounds.

MODERN BRITISH ARCHITECTURE.

During the sixteenth century, as has been mentioned, an extraordinary effort was made in Italy to restore the purity of Grecian architecture; and in this attempt Palladio was followed by the not less eminent Michael Angelo Buonarotti, who, at an advanced age, in 1546, undertook the continuation of the building of St. Peter's at Rome, a work on which the greatest splendours of the Italian style are lavished. Into England, this revived taste for the Grecian was introduced at the beginning of the seventeenth century by Inigo Jones, to whose contemptuous observations on the German or pointed style the term *Gothic* has been traced; and after his decease, the Grecian, or more properly the Italianized Grecian, was perpetuated on a scale still more extensive by Sir Christopher Wren. The edifices erected by this great master are characterized by the finest taste, and his spires in particular are models of elegance. The greatest work of Wren was St. Paul's cathedral in London, in which the Italian is seen in all its glory.

The eighteenth century was an era of decline in architectural taste. Every other style merged in that of a spiritless and often mean Græco-Italian, out of which the architects of the nineteenth century have apparently had a difficulty to emerge. Latterly, there has been a revival in England of a purer kind of Grecian, and also, as we have already said, of old English, and the Gothic or pointed style, and in most instances with good effect. It is only to be lamented that, by the manner in which state patronage is distributed in this branch of the fine arts, some of the largest and most expensive structures—Buckingham Palace and the National Gallery, for example—have been erected on the poorest conceptions of the Grecian style, and with a general effect far from pleasing. In Paris, there now exist some modern structures after correct Grecian models, which cannot be too highly praised; we would, in particular, instance the building called the Madeleine, the Bourse, and the interior of the church of St. Genevieve, which are exceedingly worthy of being visited by young and aspiring architects from Britain.

House and Street Architecture.

Till about the year 1820, the street architecture of Britain was on a poor scale; the houses ranging evenly with each other, being plain stone or brick edifices, of generally three stories in height, overtopped by a slanting and tasteless roof of slate or tile; in London and some other places, the ugly tile roof was hid by a portion of the front wall carried upwards as a parapet. At the above period, a new era may be said to have begun in town architecture, whereby the houses were built more in a bold continental style, in which the Græco-Italian was aimed at with more or less success; and latterly, this improved taste has altogether superseded the barren architecture prevalent during the reign of George III. According to this revived taste, the houses are now constructed of po

lished sandstone or covered with a plaster to resemble that material; the doors and windows are enlarged and ornamented, the floors more spacious and lofty, and the roof is invariably secluded from the eye by a balustrade or elevated coping. Some of the edifices erected at the west end of London, to accommodate clubs of gentlemen, are reckoned among the finest examples of the revived Italian style, and worthy of the best days of Palladio. The following cut, fig. 26, represents the front of the

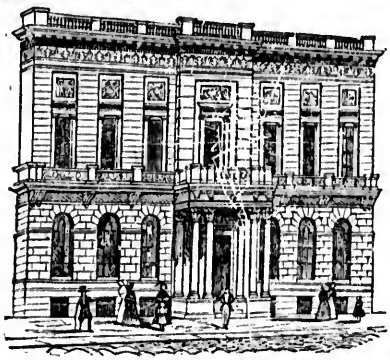


Fig. 26.

Oxford and Cambridge University Club-House, in Pall Mall, erected from a design of Mr. Sydney Smirke and his brother Sir Robert, and which is distinguished for the richness of its cornice and entablature, as well as its generally imposing effect.

The various changes effected in recent times in general street architecture are not more remarkable than those on the construction of shop-fronts, some of which now vie with the greatest efforts of the old Italian masters. A century ago, shop-fronts were little else than open booths, with an overhanging canopy, as exemplified in the antique shop of a fishmonger still remaining in the Strand, near Temple Bar. They afterwards were closed, and, as is well known, attempts were finally made to Grecianize them with pillars and pediments. The increasing rivalry and taste of shop-keepers, however, did not stop here; and in the present day very extraordinary efforts are making to place shop-fronts among the works of classic architecture. The design, generally, is to supersede plain Grecian or Roman models by highly ornamental designs after the Italian style. The most favour-

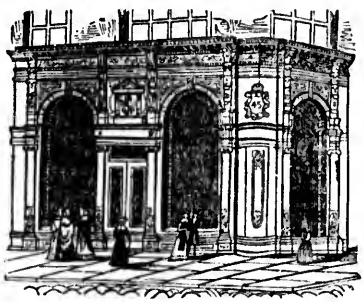


Fig. 27

able specimen we can present of this elaborate and splendid style of shop-frontage is that observable at the corner of the Quadrant, Regent Street, London (fig. 27). As an architectural composition, it possesses considerable merit, presenting, with the lightness of the plate-glass windows, the appearance of sufficient solidity and strength, and not looking as if likely to be crushed by the upper part of the edifice.

MONUMENTAL COLUMNS.

The erection of triumphal or monumental columns was a favourite idea of the Romans. Augustus erected a column of white marble near the Temple of Saturn, in the Forum at Rome, as a centre whence the account of the miles began in the calculation of distances from the city. This celebrated column, which is still in existence, is, however, not of great altitude. Among the principal triumphal columns of antiquity now remaining, is what is called the column of Pompey, constructed of red granite, and situated on a rock, about a mile without the walls of Alexandria in Egypt. The total height of this column is variously mentioned as being ninety-two feet and one hundred and fourteen feet. The spectator can never be tired with admiring the beauty of its Corinthian capital, the length of the shaft, or the extraordinary simplicity of the pedestal. To whom this famous pillar was erected is now unknown. It acquired the name of Pompey's Pillar so late as the fifteenth century. The preceding cut will convey a correct idea of its outlines.

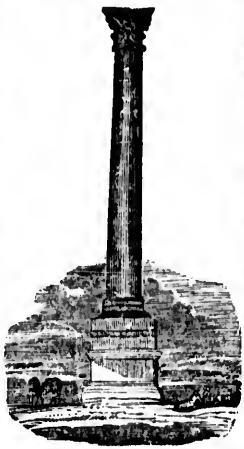


Fig. 28.—Pompey's Pillar.

The Trajan Column, which falls next to be mentioned, is one of the most celebrated monuments of antiquity. Its height including the pedestal and statue, is 132 feet. This monumental column was erected in the centre of the Forum Trajani, and dedicated to the Emperor Trajan for his decisive victory over the Dacians, as is testified by the inscription on the pedestal. It is of the Doric order, and its shaft is constructed of thirty-four pieces of Greek marble, joined with cramps of bronze. For elegance of proportion, beauty of style, and for simplicity and dexterity of sculpture, it is the finest in the world. The figures on the pedestal are masterpieces of Roman art. It was formerly surmounted by a statue of Trajan, which has been succeeded by one of St. Peter. There are other columnar erections in Rome; one of which is the column of the Emperor Phocas, near the Temple of Concord; it is of Greek marble, fluted and of the Corinthian order, four feet diameter, and fifty-four feet high, including the pedestal.

The column which ornaments the British metropolis, better known as the Monument, was designed by Sir Christopher Wren, and erected by order of parliament, in memory of the burning of the city of London, anno 1666, in the very place where the fire began. This pillar was begun in 1671, and finished in 1677. It is of the Doric order, fluted, 202 feet high from the ground and fifteen feet in diameter, of solid Portland stone, with a staircase in the middle, of black marble, containing 385 steps. The lowest part of the pedestal is twenty-eight feet square, and its altitude forty feet; the front being enriched with curious bas-reliefs. It has a balcony within thirty-two feet of the top, on which is placed a blazing urn of gilt brass.

The column in Phœnix Park, Dublin, differs from any

other work of this descriptio.. It was erected in 1745. It stands in the centre of an area where four great avenues meet, and from which there are entrances to the viceregal lodge, and that of the chief secretary. The trees which shade the avenues form vistas, through which the perspective view of the column forms a picturesque object. The pillar is formed of Portland stone, and is of the Corinthian order, fluted, and highly ornamented—the base and pedestal five feet in height, the shaft and capital twenty, and the phœnix which surmounts the column five feet, so that the whole presents an object thirty feet high.

The Napoleon Column has justly been considered as the greatest ornament of the French capital. It stands in the Place Vendôme, and was erected to commemorate the successful result of Bonaparte's arms in the German campaign of 1805. Its total elevation is one hundred and thirty-five feet, and the diameter of its shaft is twelve feet. It is in imitation of the pillar of Trajan at Rome, and is built of stone, covered with bas-reliefs (representing the various victories of the French army), composed of twelve hundred pieces of cannon taken from the Russian and Austrian armies. The bronze employed in this monument was about three hundred and sixty thousand pounds' weight. The column is of the Doric order. The bas-reliefs of the pedestal represent the uniforms and weapons of the conquered legions. Above the pedestal are festoons of oak, supported at the four angles by eagles, in bronze, each weighing five hundred pounds. The bas-reliefs of the shaft pursue a spiral direction from the base to the capital, and display in chronological order the principal actions of the campaign, from the departure of the troops from Boulogne to the battle of Austerlitz. The figures are three feet high; their number is said to be two thousand, and the length of the spiral band eight hundred and forty feet. Above the capital is a gallery, which is approached by a winding staircase within, of one hundred and seventy-six steps. The capital of the column is surmounted by an acroterium, upon which stands the statue of Napoleon, measuring eleven feet in height, and weighing five thousand and twelve pounds. The total expense of this sumptuous monument was 1,500,000 livres.

There are also several smaller columns, but of beautiful proportions, in various parts of England, in imitation of the above, but mostly of the Grecian or pure Doric order, as the Anglesea Column, erected in commemoration of the battle of Waterloo, and the noble earl of that name, in the island of Anglesea; the column at Shrewsbury, erected in commemoration of the same event, and of another noble general, Lord Hill; the Nelson Columns at Yarmouth and in Dublin; the Wellington Column at Trim, in the county of Meath, Ireland; the monument commemorative of Lord Melville at Edinburgh; and a similar one at St. James's Park of the Duke of York, &c. A very common error is committed in the erection of monumental columns, by loading their summit with a clumsy mass of masonry, on which the statue is placed, and technically called an *acroterium*. The Melville monument at Edinburgh presents the most notable instance of this kind of defect. If there must be an acroterium, it cannot be too modest in its proportions, or too little seen by the spectator.

BRIDGES.

The art of bridge-building is traced to the Romans. In the brightest days of the Grecians, when their fine style of architecture was complete, when their porticos were crowded with paintings and their streets with statues, the people of Athens waded or ferried over the Cephisus for want of a bridge. The Greeks do not seem to have valued the construction of the arch sufficiently, to excel in bridge-building. No people of the ancient world carried the power of rearing the stupendous arch and the magnificent dome to such an extent as the Romans. After the construction of their great sewers, the aqueducts, and the cupola over the Pantheon M Agrippa, a bridge over the Tiber was of easy execution and the invention of the architecture of stone bridges, a practised in its best and most effectual manner, must be conceded to this great and indefatigable people. The most celebrated bridges of ancient Rome were not distinguished by the extraordinary size of their arches nor the peculiar lightness of their piers, but, like the rest of the magnificent works of this city, as far as constructior is concerned, they are worthy of study from their excellence and durability. The span or chord of their arches seldom exceeded seventy or eighty feet, and the versed sine or height was nearly half of the chord, so that they were mostly semicircular, or constituted a segment nearly of that form.

Among the most celebrated bridges in modern times, or those built subsequently to the destruction of the Roman empire, are those of the Moors in Spain, who imitated and rivalled the best constructions of the Romans. In Great Britain, the art of building bridges appears to have been diligently studied from early times. The most ancient bridge in England is the Gothic triangular bridge at Croyland, in Lincolnshire, said to have been built in 860. The ascent is so steep that none but foot passengers can go over it—a common peculiarity of old bridges.

The greatest improvement effected in modern times upon bridge-building consists in constructing them with so level a surface or roadway above, that they are easy of access. The most splendid work of art of this kind is Waterloo Bridge, across the Thames. Its length is 1250 feet. It consists of nine elliptical arches, each of 120 feet span and 32 feet in height. Westminster Bridge was commenced in 1740, and completed in 1750. It is 1220 feet long, and 44 feet between the parapets; has thirteen large and two small arches, all semicircular. The middle arch is 76 feet in span. The newly-erected London Bridge is also an elegant structure, and excepting Waterloo Bridge, is perhaps the finest bridge in the world. At Paris there are some remarkably good stone-bridges across the Seine, also an excellent suspension bridge. One of the most curious provincial bridges in Great Britain, is that at Taff, in Glamorganshire. It is of one arch, and its span is rather more than 140 feet. The architect of this bridge was a poor uneducated man; and the persevering courage with which he pursued his object till the completion of the edifice, is worthy of record. His first attempts failed, in consequence of the enormous pressure of the haunches or sides of the bridge, which forced up the key-stone; and to obviate this, he pierced the stonework with cylindrical apertures, which remedied the defect. Prior to the erection of this bridge, that of the Rialto at Venice had the largest span of any in existence.

Metal bridges are the invention of British artists. The true elements of their construction are as yet but imperfectly understood. The Southwark bridge over the Thames is at present the finest iron bridge in the world. It consists of three arches. The chord of the middle arch is 240 feet long, and its height 24 feet. There are several other fine bridges of this kind in England, in particular one at Sunderland, in the county of Durham.

The art of making suspension bridges is not new, but it is only in recent times that it has been brought to perfection. In this kind of erection the flooring or main body of the bridge is supported on strong iron chains or rods, hanging in the form of an inverted arch, from one point of support to another. The points of support are the tops of strong pillars or small towers, erected for the purpose. Over these pillars the chain passes, and is attached at each extremity of the bridge to rocks, or massive frames of iron firmly secured under ground.

The largest suspension bridge in Great Britain is that erected by Mr. Telford over the Menai Strait, between the Isle of Anglesea, and the mainland of Caernarvonshire, in North Wales. The roadway is 100 feet above the surface of the water at high tide, the opening between the points of suspension is 560 feet, and the platform 30 feet in breadth. This elegant and stupendous work has been outmatched by the suspension bridge across the river Saane, at Friburg, in Switzerland, erected by M. Chaley, a French engineer. The bridge is entirely of one span, and perfectly level. The roadway, which is of wood, is supported not by solid iron rods, as is usual with such fabrics, but by four cables of small iron wires, each cable being composed of 1056 wires, bound in close union by bands of wires at regular distances; the thickness of each cable may be about ten inches. The total length of the roadway is 905 feet, its elevation above the bed of the Saane 174 feet, and its breadth 28 feet. The striking grandeur of this stupendous work of art cannot be described. The bridge must be visited in order fully to appreciate its wonderful architectural excellences.

THE PRACTICE OF ARCHITECTURE.

Architecture is practically conducted by two distinct classes of men—*architects*, whose profession consists in planning designs of buildings according to the wish of an employer; and *builders*, who, assisted by operative masons and other artisans, work out the plans in all their various parts. Some architects derive celebrity for designs for churches and public edifices, others for domestic structures, and a third class, who are sometimes styled *civil engineers*, are eminent for their plans of piers, quays, bridges, docks, aqueducts, and other great public works.

In representing proposed edifices by drawings, architects make use of the plan, elevation, section and perspective. The *plan* is a map or design, of a horizontal surface, showing the ground-work, with the relative position of walls, columns, doors, and other details. The *elevation* is a drawing of the front, without any perspective effect. The *section* shows the interior of the building as if the outer wall were removed. The *perspective* shows the building as it appears to the eye at a little distance, and is generally executed so as to give the effect of a picture. Along with the different designs, *specifications* of the work to be executed are put into the hands of the builder; these specifications are minute definitions of what must be done in the departments of the stone-mason, bricklayer, joiner, slater, plumber, glazier and plasterer, as well as of the nature of the materials to be employed.

The rules of building require, that in a whole fabric judiciously and elegantly erected, there should be solidity, convenience and beauty, along with simplicity and harmony of design. The structure, whatever it is, must be in character, or look like that for which it is intended. If a church, it should have the appearance of a church; if a house, a house; and if a castle a castle. Some tastes would construct a cottage in the shape of a Norman fortress, with battlements and loop-holes; but all such oddities are essentially vulgar. It is an important principle in architecture to preserve character, and to make a building expressive yet simple in its outlines, and all of a piece. If there is ornament, it must be duly distributed, not overloaded at one part and meagre at another. The design, to be striking, must also be of a height and breadth sufficient to fill the eye of the spectator. To aid in this desirable object, the buildings should be well placed, and, if possible, at the summit of slightly rising grounds, where they will stand clear of ungraceful objects. Unfortunately this principle has not always guided our architects. Magnificent temples which crowned the summits of rising grounds in Greece, we find imitated in hollows; and the eye of the spectator, instead of taking in a bold and lofty outline of pillars relieved against the clear blue sky, is offended by looking down upon clusters of chimney-pots. Thus innumerable public buildings in England and Scotland, possessing, intrinsically, good architecture, are greatly spoiled by the want of taste in those who have placed them in unseemly awkward situations. It appears to us, likewise, that far too little attention is usually paid by architects to the nature of our climate. We cannot recall to remembrance one public edifice in the Grecian style in this country which does not exhibit a dingy damp look. At every projecting point, and particularly over the pediments, pillars, and flat cornices of doorways, there is generally an ugly spot covered with moisture, and exhibiting the early rudiments of vegetation on the walls. All this offends the eye of the spectator, and excites universal notice, except among those who can see nothing but beauty in Grecian architecture, however clumsy it may be, and however much out of place. Architects likewise require to guard against introducing forms which will revive recollections of unpleasing or mean objects. Fine buildings have been rendered ridiculous by inattention to this point. One structure is defaced by a dome the exact model of an inverted punch-bowl; the pinnacles of another resemble the upturned legs of a foot-stool; the front of a third is like a grenadier's cap; and the corners of a fourth are defaced by turrets the shape of pepper castors. The most distant resemblance to all familiar objects ought to be carefully shunned.

Another point requires consideration. In cases where ornament is not introduced on a large scale, masses of wall will be greatly improved by being thrown into different projections; and this leads us to notice that the effect of interiors, when ornamented with pillars, is vastly enhanced by causing some to project and others to recede, thus gratifying the eye with what is seen, and raising hopes of beauties in those parts which are partially hid from observation. This breaking into seen and unseen parts is well exemplified in the church of St. Genevieve at Paris.

Certain practical matters equally require attention in the erection of buildings. The foundation must be laid on a solid basis of rock, gravel or till; and if the situation be soft or of doubtful stability, the ground should be fixed by piles of timber driven to a considerable depth. It is likewise a point of first importance to have the stool or lower part of the house free of damp; and this is only attainable by excavating the loose earth, and paving the surface with a material impervious to moisture. In general, in the construction of cottages or villas, far too little attention is paid to this particular, and they are therefore much colder and more damp than they ought to be.

In designing windows, the approved rule is to make each twice its width in height; those in the upper-floor story are generally made nearly square, but it is preferable to make them a third higher than broad. The stairs should be of easy access; the rise of each step to be six, or not more than seven inches, and the breadth at least ten inches.

MATERIALS USED IN ARCHITECTURE AND KINDRED ARTS.

Stones.

Marble.—The class of rocks denominated *calcareous* are exceedingly numerous and abundant in nature; and of these, marble in its different varieties is one of the most beautiful. It is a granular carbonate of lime, varying in colour, texture, and hardness, and being susceptible of a fine polish, it is extensively used for building, statuary, decorations, and inscriptions. In dry and temperate countries, it is one of the most durable of substances, as is proved by the edifices of Athens, which have retained their polish for more than two thousand

years. Severe frost, preceded by moisture, causes it to crack and scale; and great heat reduces it to quicklime. Marble is wrought by chiselling, and by sawing with smooth plates of iron, along with sand and water. It is polished by rubbing with sand and water, and afterwards with putty and other soft substances.

Numerous stones of the calcareous class, more or less approaching to marble in their character, have been converted to use in different countries. The pyramids of Egypt are built of a grayish-white calcareous stone, enclosing shells. The Parthenon and other structures of Athens are of Pentelican marble, distinguished by slight green veins. The mosques of Constantinople are of a fine-grained limestone from Pappenheim, the same which is now used in lithography. At Rome, a porus whitish limestone, called *tophus* by the ancients, and *travertino* by the moderns, is the material of the Coliseum, of St. Peter's Church, and other structures. The ruins of Pæstum are of a stone nearly similar. Paris is built with a calcareous stone very prevalent in France, nearly the whole range of the Jura being of that material. The Portland stone, of which St. Paul's and other edifices in London are constructed, is a calcareous rock called *oolite* by geologists. (See article GEOLOGY.) Of those finer calcareous rocks, constituting the marbles, many are found in Great Britain, particularly in Wales and the Highlands of Scotland; but they are not wrought extensively, as they are not employed except for interior ornaments, such as chimney-pieces, and for this purpose they are excelled by foreign marbles of the pure white variety. The Parian marble, of which the Venus de Medicis is formed, is reckoned the finest of its kind.

Granite.—This is apparently the oldest and most deeply situated of all rocks, and is often found shot up to great heights among rocky materials of more recent formation. It is very hard and durable, and is obtained for the purpose of the architect or sculptor in larger pieces than any other rock. Granite is a compound stone, varying in colour and coarseness, having generally a whitish-gray or mixed appearance. It consists of three constituent parts, namely, *quartz*, the material of rock crystal; *feldspar*, which gives its colours, and which is the material of porcelain earth; and *mica*, a transparent, thin, or foliated substance, which affords a flexible substitute for glass, when obtained in large pieces. Granite is chiefly used for building. It is split from the quarries by rows of iron wedges driven simultaneously in the direction of the intended fissure. The blocks are afterwards hewn to a plain surface by strokes of a sharp-edged hammer. Granite is also chiselled into balustrades, capitals, and other ornamental objects; but this operation is difficult, owing to its hardness and brittleness; it is polished by long-continued friction with sand and emery. There are large quarries of granite in the British islands, particularly near Dublin and Aberdeen; the stone from the latter is highly celebrated, and has been used in building Waterloo Bridge in London.

Porphyry.—This, like granite, is a compound rock, commonly consisting of felspar and quartz; the former in more or less distinct crystals; there are, however, several varieties. The colour of porphyry is often red or green, and, when polished, is valuable for ornamental work, being superior to marble on account of its greater hardness. This rock abounds in Egypt, in Mexico, and in South America; it also exists in the vicinity of Boston, in North America.

Lapis Lazuli.—This is a stone of splendid azure-blue colour, often mingled with small crystallizations, and thready lines of gold-like metal. The finest specimens are brought from China, Persia, and Great Bucharia. It is much esteemed for ornamental purposes, especially for pillars and inlaid work. The most superb exhibition of this rare substance is made in the celebrated marble palace built by Catherine, at St. Petersburg, for her favourite Orlof, in which the[illegible] are costly apartments inlaid with lapis lazuli. The great expense prevents it from being used to any extent in Great Britain, where, however, it is occasionally well imitated on wood by decorative painters. It is employed in forming the valuable pigment called *ultramarine*.

Freestone, or, more properly, *sandstone*, consists of particles of sand, or silica, united by a natural cement and great pressure. It varies in colour from dusky red to yellow and grayish-white. The most esteemed for building is the yellow or white kind, and particularly that which possesses no tinge of iron. The best varieties are hard, but easily wrought by hammers and chisels, and are so close in texture as not to scale off or moulder through the influence of the weather. Those kinds which are inclined to softness, should, after building, be smeared with a light varnish of oil, to fill the pores and prevent the encroachments of damp. The thinnest possible pellicle of white oil paint will be found to render sandstone indestructible by weather. Freestone is largely employed in Great Britain for fronts to public edifices and churches, but is not much employed in domestic architecture. The chief towns built of it are Bath, Edinburgh, and Glasgow. Near Edinburgh, and also in Fife, there are large quarries of this useful stone, suitable either for architecture or sculpture.

Trap.—The variety of this class of rocks, usually called *greenstone*, and in Scotland *whinstone*, is largely used in some places for house-building. It is a hard bluish substance, which breaks easily into square lumps, but is too brittle for polishing like sandstone. Quartz, felspar, and hornblende, form a variety of trap called *sienite*. All varieties of trap make excellent materials for macadamizing roads.

Bricks.

Bricks are artificial stones formed of clay, one of the most abundant and useful of earths, composed principally of alumine and silex. When wetted, clay assumes the character of a tenacious paste, which is changed by heat to a stony hardness. Common clay, of which bricks are most generally made, and also coarse potter's ware, contains oxide of iron, which causes it to turn red in burning. The purer sorts burn to a yellow appearance, and pipe-clay becomes white. *Refractory* clays are those which endure the greatest heat without melting. The best fire-brick, or that which is capable of resisting the action of the fire in ordinary furnaces, is made from a slaty kind of clay, and contains a good deal of sand.

"The general process of brick-making consists in digging up the clay in autumn; exposing it, during the whole winter, to the frost and the action of the air; turning it repeatedly, and working it with the spade; breaking down the clay lumps in spring, throwing them into shallow pits, to be watered and soaked for several days. The next step is to temper the clay, which is generally done by the treading of men or oxen. In the neighbourhood of London, however, this process is performed in a horse-mill. The kneading of the clay is, in fact, the most laborious but indispensable part of the whole business; and that on which, in a great measure, the quality of the bricks depends. All the stones, particularly the ferruginous, calcareous, and pyritous kinds, should be removed, and the clay worked into a homogeneous paste, with as little water as possible. The earth being sufficiently kneaded, it is brought to the bench of the moulder, who works the clay into a mould made of wood or iron, and strikes off the superfluous matter. The bricks are next delivered from the mould, and ranged on the ground, and when they have acquired sufficient firmness to bear handling, they are dressed with a knife, and staked or built up in long dwarf walls, thatched over, and left to dry. An able workman will make, by hand, 5000 bricks in a day."

Bricks are baked either in large square masses, called *clamps*, in which there is a layer of brick and small coal alternately, or in kilns. Baking in kilns, continues our authority, is preferable, "as less waste arises, less fuel is consumed, and the bricks are sooner burnt. The kiln is usually 13 feet long by 10½ wide, and about 12 feet in height. The walls are one foot two inches thick, carried up a little out of the perpendicular, inclining towards each other at the top. The bricks are placed on flat arches having holes left in them resembling lattice-work; the kiln is then covered with pieces of tiles and bricks, and some wood put in to dry them with a gentle fire. This continues two or three days before they are ready for burning, which is known by the smoke turning from a darkish colour to transparent. The mouth or mouths of the kiln are now dammed up with pieces of bricks piled one upon another, and closed with wet brick earth, leaving above it just room sufficient to receive a fagot. The fagots are made of furze, heath, brake, fern, &c., and the kiln is supplied with these until its arches look white and the fire appears at the top; upon which the fire is slackened for an hour, and the kiln allowed gradually to cool. This heating and cooling are repeated until the bricks are thoroughly burnt, which is generally done in forty-eight hours. One of these kilns will hold about 20,000 bricks."—*Ure's Dictionary of Arts.*

Mortar, Plaster, Cement.

Mortar.—The mortar or cement employed to unite stones or bricks into a compact mass in building, is formed of quicklime, sand, and water. Quicklime is procured by burning limestone in kilns. It is brought from the kilns in the form of *shells* or brittle masses, which are reduced to powder by pouring water upon them. This process is called the slaking of the lime. When intended for mortar, it should immediately be incorporated with sand, and used without delay, before it imbibes carbonic acid from the atmosphere. Lime, thus mixed with sand, becomes harder and more cohesive and durable than if it were used alone. It is found that the sand used in common mortar undergoes little or no change; while the lime, seemingly by crystallization, adheres to its particles and unites them together. The mortar or cement formed in this manner continues to increase in strength and solidity for an indefinite period, the hydrate of lime being gradually converted into a carbonate. Such is the strength which mortar thus acquires by time, that in some old buildings the lines of cement remain entire, while the stones have decayed.

In making mortar, fresh sand from a pit is to be preferred to that taken from the sea-shore, the salt of which is liable to keep the building moist, and to weaken the strength of the cementing property. The sand most proper for mortar should consist of angular particles not rounded by attrition. The proportions of the lime and sand to each other are varied in different places; the amount of sand, however, always exceeds that of the lime. The more sand that can be incorporated with the lime the better, provided the necessary degree of plasticity be preserved; for the cement becomes stronger, and it also sets or consolidates more quickly, when the lime and water are less in quantity and more subdivided. The more pure the lime, and the more thoroughly it is beaten or worked over, the more sand it will take up, and the more firm and durable does it become. In many cases, modern builders pay little or no attention to the slaking and preparing of their mortar, which, from whatever cause, is very inferior to the ancient cements.

Plaster, or the material which is used to spread smoothly over walls, is of various kinds. That which is applied to inner walls or partitions is formed of certain proportions of slaked lime, fine sand, and water, with an infusion of neat's hair to assist in giving cohesion. The lime requires to be sifted finely, and the more free it is of small lumps the better it is; as such lumps are apt to swell in the walls and cause blisters, it is usual to allow plaster to remain some time made before using.

Stucco.—This is the name ordinarily given to plaster of Paris, which is gypsum reduced to powder by heat and grinding. Gypsum, which is found in roundish hard masses, is properly a sulphate of lime, and like all other varieties of lime, it has a strong power of absorbing water. The practice is to put the masses into a heated oven, and when duly baked, to take them out and grind them to powder in a mill. This powder, when sifted, is a beautiful white substance, resembling flour. A quantity of powder being put in a vessel, water is poured upon it, and immediately the stuff thickens in a surprising manner, and becomes a hardened mass. While still thickening or setting, it is poured into a mould for any required shape; or it may be applied along with a little lime as a fine plaster, which it is desirable should dry speedily. It is used largely for all kinds of casts from pieces of sculpture, mouldings for cornices, and is indispensable in stereotyping.

Mastic.—This is a resinous substance obtained from incisions made in the branches of the *pistachia lentiscus*, a small tree or shrub growing in the Levant and other countries bordering on the Mediterranean. It abounds in Scio, where it has long been cultivated. The gum being chewed or used as a *masticatory* by women in Turkey, for the purpose of cleansing the teeth and imparting an agreeable odour to the breath, hence its European name of *mastic*. The mastic used by builders for closing seams in outer walls is generally composed of Roman cement, oil, and sand, the whole mixed as a paste; it takes a considerable time to dry, but ultimately becomes hard and durable.

Puzzolano.—Water cements, also called Roman cements, are those which have the property of hardening under water, and of consolidating almost immediately on being mixed. Common mortar, although it stands the effect of water very well when perfectly dry, yet occupies a considerable time in becoming so, and dissolves or crumbles away if laid under water, before it has had time to harden. It is found that certain rocks which possess an argillaceous as well as a siliceous character, if mixed with lime or mortar, communicate to them the property of hardening in a very few minutes after the mixture has taken place, as well under water as out of it. Substances of this sort have therefore been made the basis of water cements. The ancient Romans, who practised building in the water, and particularly in the sea, to a great extent, first availed themselves of a material of this kind. They erected their villas, not only on the sea-shore, but in artificial quays and islands constructed in the water. To enable them to erect these marine structures, they fortunately discovered, at the town of Puteoli, a peculiar earth, to which they gave the name of *pulvis puteolanus*, and which is the same as that called by the modern Italians *Puzzolano*. This earth is a light porous friable mineral, various in colour, and evidently of volcanic origin. When reduced to powder by beating and sifting, and thoroughly mixed with lime, either with or without sand, it forms a mass of great tenacity, which in a short time cements to a stony hardness, not only in the air, but likewise when wholly immersed in water.

Cements of various kinds are employed for covering the outer walls of buildings, so as to resemble stone. One of the best, we believe, is Martin's Patent Cement, which is extensively used in England, in imitation of Bath, Portland, and other descriptions of stone. A very excellent plan of cementing for this purpose is to employ good plaster of lime and sand; only two coats to be

laid on and finished without stucco, and afterwards well painted. If stucco be dressed on as a third coat, it will scale off.

Pavements—Roofing.

Pavements are formed of marble, stone, slate, or some kind of artificial compound. Marble, on account of its costliness, is little employed for this purpose in Great Britain; and the floors of lobbies, halls, and also pathways, are more generally formed of slabs of sand-stone, bedded on mortar, and neatly joined together. The stone employed for pavements exposed to the atmosphere should be hard, and not liable to scale off by the effects of the weather. Stone inclining to slate forms the most durable pavement, and possesses the great advantage of being impervious to damp. The floors of churches in the Netherlands, and also the common pavements of that country, are of a material of this kind, and we should recommend the use of slate for ground-flooring in all similarly damp countries and situations.

Wooden pavement.—The idea of paving with pieces of wood, the points of the grain upwards, was propounded in the year 1825, but was not carried into execution till nearly fifteen years later. Two plans have been pressed on public attention; the first is that of Mr. Stead. It consists of pieces of wood, each from four to eight inches deep, as cut lengthwise from the timber, and about six inches across, but fashioned round the sides into a hexagonal shape; these are set in rows on a flat basis, and are held together by mutual pressure throughout the mass. This plan, by which individual pieces are apt to sink and form ruts or hollows, is, in our opinion, inferior to that of an ingenious foreigner, Count de Lisle, which is conducted by the Metropolitan Wood-pavement Company, in London. By this plan, a squared piece of timber is cut diagonally into pieces, rhomboidal in shape, or each the stereotony of a cube. The size is six inches deep by nearly the same in width. The pieces are set on a flat basis, one overlapping the other, and are held together and in their places by pins in the sides.

When one row has been laid down, all the pieces lean in one direction across the street, the next row being made to lean the contrary way, and so on with all succeeding rows. By means of the pins in the side, each row is fastened close and firmly up to the other, so as to prevent all shifting. If we now examine the principle on which the pressure is sustained by the united blocks, it will be observed that, by means of the overlapping, no single block supports any given pressure that falls upon it, except at a point in the middle; at other points, the pressure is distributed over at least two blocks—the upper part of one, and the lower part of another. The resistance which is therefore given by the mass to all the ordinary kinds of pressure from horses and vehicles, must be much greater than that offered by blocks standing isolated, either with respect to overlapping or pinning. Another very great advantage is the mode of laying down blocks pinned together in masses. It seems that lumps of a yard square, or thirty-six blocks, may be put down at once, and that a mile of street could be laid down in three days. In the event of after-repairs, or when the streets are to be opened for laying gas or water pipes, these lumps can again with ease be taken up and laid aside. Across the upper surface, grooves are cut at short intervals, to afford indentations for the horses' feet. The whole, when laid in a proper manner, has the appearance of neat oblong pavement.

The advantages of wood over stone pavement are far greater cleanliness, as respects either dust or mud, much less noise, and in some places considerably less expense. The only disadvantage, as far as we have ever heard, is the over-smoothness of surface, in consequence of which horses have a tendency to slip and come down. In London and various towns in England, the Count de Lisle's plan has latterly spread considerably, and is now generally esteemed. It does not appear likely to come into use, however, in places where stone is abundant. The cost of about 11s. or 12s. per square yard for wooden blocks may be cheap in London, but would be excessively high in Edinburgh and other places where stone abounds.

Slates.—The thin and trimmed laminæ of slate from the quarries form the handsomest and most durable roofing for all kinds of houses in which a slope is allowable or required. The best kinds of this material are found in Wales, and are now thence imported to most seaports. Tiles, formed of burnt clay, are a more unsightly and less durable kind of roofing, but their comparative cheapness causes them to be largely employed for at least all common edifices. The neatest tiles are flat and angular, and are held to the rafters by pegs, the interstices of each row being plastered before lapping over the next above it. Those tiles are the strongest which contain a proportion of iron.

Asphalte has lately been adopted to a large extent in France and some other countries, both as pavement and as waterproof roofing for buildings. Asphalte, or asphaltum, is a bituminous mineral, allied in its nature to pitch, and is found in the form of rocky masses in different parts of the world. The chief quarries for it in continental Europe are in the Val de Travers, province of Neuchatel, the excavations being in the Jura range of mountains, which are calcareous in their nature. An inferior kind is a species of bituminous molasse, which exists in various parts in what must be called lakes, or vast semi-fluid masses. The true asphalte, or asphaltic cement of Neuchatel, is procured by boring and blasting the bituminous rocks, and the pieces being brayed and then melted in large boilers, the hot fluid is poured out so as to form conveniently-sized cakes. When needed for smearing on roofs, it requires to be only melted and spread, and when dry, it remains impervious to the weather, neither cracking in winter nor melting in summer. If designed for pavement, it is customary to mix fine river sand with it, which gives it more stability, and a degree of roughness that is not unnecessary. It is spread while hot on a properly prepared bed, and being rendered smooth on the surface, it offers an exceedingly agreeable resistance to the foot, being not so hard as stone, nor so soft as a mud pathway. Wherever stone is expensive, this asphaltic pavement may be advantageously employed, not for streets, but floors of dairies and other outhouses, garden-walks, and terraces.

Zinc (see article CHEMISTRY), a metal of a light-bluish tinge, has lately come into use for covering buildings, and also for forming gutters to carry off the rain from roofs. It is much thinner than lead, and being made in large rolls, it can be laid to any length; its lightness and comparative cheapness render it suitable for temporary edifices, and also for buildings which could not support a heavy roof. It does not oxidize or rust by exposure, and will last a long period of time if not damaged.

Note.—In the compilation of the present sheet, besides the authorities mentioned, we have been indebted to some learned articles in the "Encyclopedia Americana" (Conversations Lexicon), and also to "Elements of Technology," by Dr. Jacob Bigelow.

DICTIONARY OF CLASSICAL TERMS.

[The extensive use of classical terms and allusions in modern literature, places a serious stumbling-block in the way of all readers who have not received a regular scholastic education. Hence, such an explanatory dictionary as that contained in the present sheet, will prove, it is hoped, alike acceptable and useful to a large section of the public.]

Academia, a pleasant and finely wooded spot in the vicinity of Athens, which derived its name from the proprietor Academus, and became renowned as the spot where Plato taught philosophy to his pupils. These were thence termed Academics; and a familiar appellation, originating in the same source, is bestowed on seats of learning and education at the present day.

Achaia, a district of the Peloponnesus or Morea, the people of which held so considerable a station among the ancient Greeks, that their name was frequently used to denote the entire population of the country.

Achates, a follower of Æneas, so faithful and devoted that his name has become proverbially significant of constancy in friendship, being applied to Sir John the Graeme, among others, on account of his adherence to Wallace.

Acheron, a gloomy river in the fabulous infernal regions of the classical mythology, imagined by some writers to lie near the south-west extremity of the Euxine or Black Sea.

Achilles, son of Peleus, king of Thessaly, by the sea-goddess Thetis. Educated by Chiron, a learned centaur (half man, and half horse), Achilles is represented as having become perfect in all the accomplishments of his heroic age, and had just attained the prime of youthful manhood, when the princes of Greece went to war with Troy. Thetis, foreknowing that her son would fall in that contest, disguised him as a female to prevent his entering into it, but he was detected, and, not against his will, went with the other chiefs to Troy, where he distinguished himself above all the Greeks by consummate daring and prowess. A quarrel with the leader, Agamemnon, caused him at length to withdraw in disgust from the field; and, in spite of the entreaties of his countrymen, he remained obstinately inactive in his ships, until the death of Patroclus by the hand of Hector caused him to don the splendid panoply formed for him by the armourer of the gods, and rush to the scene of battle. Many Trojans fell before the infuriated chieftain, and, finally, Hector himself was cast lifeless on the field. In his youthful days, Thetis had rendered her son invulnerable by dipping him in the river Styx; but the tendon of the heel by which she held him (hence called the *tendo Achillis*) was left unsecured, and Paris, the brother of Hector, slew the chief by a wound in that spot, thus fulfilling the decree of fate. Strength, swiftness, and beauty of person, are the leading characteristics assigned to Achilles by the poet Homer; and it is worthy of remark, that speed of foot is one of the most valued qualities of a Greek chief at this day, Marco Bozzaris, a man worthy of the old times, being renowned for this property.

Acis, a son of Faunus, slain by the one-eyed giant Polyphemus, on account of a rivalry between them for the love of the nymph Galatea. The latter changed Acis into a river, yet called the Jaci. Handel produced a fine opera on the subject of Acis and Galatea.

Acrocorinthus, the citadel rock of Corinth, an eminence of great height and strength.

Actæon, a Boeotian huntsman, who, having accidentally beheld Diana bathing, was changed by the chaste goddess into a stag, and torn to pieces by his own dogs. The "Fate of Actæon" is a phrase expressive of the ruin of a man by his own friends, or from unwittingly becoming cognisant of dangerous secrets.

Adonis, a youth of great beauty beloved by Venus, who, on his being gored to death by a wild boar, converted him into the flower Anemone. Some say, however, that life was granted to him during six months of every year, at the entreaties of Venus.

Æneas, a Trojan prince, son of Anchises and Venus, who, on the fall of Troy, is said to have wandered with a small band to Italy, and there to have laid the foundation of the Roman empire. The Romans were proud of this traditional descent; and Virgil made it the subject of his great national epic.

Æolus, the god of the winds, according to the classical mythology. The "Æolian harp" derives from him its designation.

Æschylus, a tragic writer of Athens, whose style is peculiarly vehement and sublime.

Æsculapius, a personage honoured as the god of medicine, and reputed to be the son of Apollo by a mortal nymph. Exposed in infancy to save his mother's reputation, he fell under the care of Chiron the centaur, and acquired such skill in the healing art as even to recover dead persons from the grave. For this feat, Pluto, the king of the nether realms, persuaded Jupiter to kill him with a thunderbolt. Many temples were erected to Æsculapius; and he was generally represented in the form of an old man, with one hand on a staff and the other on a serpent's head. The latter animal is to this day the emblem of medical science; and the name of the supposed divinity is familiarly applied to the art and its professors.

Æsop, a native of Phrygia, renowned as a writer of fables. His actual productions are lost; but the Latin fabulists profess to have translated from his original Greek. He is stated to have been deformed in person, and a slave by station.

Ætna, the most famous volcanic mountain in the world, situated in Sicily, and rising to a height of more than 11,000 feet above the sea-level. The noise and flame emitted from it led the imaginative ancients to make its interior the workshop of the smith-god Vulcan.

Agamennon, king of Mycenæ, in the Peloponnesus, and leader of the Greeks in the expedition against Troy. The character given to him by Homer is one of massive grandeur. He was murdered, on his return home, by his wife Clytemnestra and her paramour Ægisthus.

Aglaia, one of the three Graces.

Agrarian Law.—During the times of the republic, some ambitious men endeavoured to win the favour of the Romans by passing a law for the equal division among them of portions of individual property. Great disturbances followed. The phrase is yet often used to signify arbitrary divisions of individual property among a community.

Agricola (Cn. Julius), a Roman general, who, under various emperors, served with great distinction in Britain, defeating Galgacus, among others, near the Grampian hills.

Ajax, son of Telamon, and famous in the war of Troy for his bravery, and vast though unwieldy strength. He became mad, and slew himself, because the arms of the deceased Achilles were not assigned to him. Another Ajax also figured in the same contest.

Alcestis, wife of Admetus, king of Pheræ, who vo

untarily died for her husband's sake, and was brought again from the regions of the dead by Hercules.

ALCIBIADES, an Athenian noble, remarkable for beauty of person and intellectual capacity, and not less notorious for his vices and luxurious effeminacy. He was a pupil of the philosopher Socrates, and owed much to his instructions. After a youth spent for the most in folly, yet folly redeemed in part by generous actions, he entered into the service of the state, and showed eminent talents as a military and naval commander. However, his fickle countrymen, influenced by demagogues, soon found cause of quarrel with him. In his absence, some of his wild frolics were represented as a profanation of the rites of religion, and he was recalled for trial. He did not obey, and his property was confiscated. Boiling with indignation, the high-spirited Alcibiades united himself with Sparta and Persia, the rival and the enemy of Athens. The latter state began then to decline before its adversaries, until Alcibiades relented, and restored its fallen fortunes. But after raising him once more to command, the Athenians anew pulled him down, and Alcibiades took refuge first in Thrace, and afterwards in the Persian possessions in Asia Minor. The viceroy there grew jealous of him, however, and sent assassins to his lodging, who, not daring to meet him hand to hand, basely slew him by projectile weapons as he attempted to escape. Alcibiades was a being of great and varied endowments, but his life proves he was deficient in that settled rectitude of principle which can alone constitute the perfect statesman and hero.

ALECTO, one of the three Furies, daughters of Nox or Night.

ALEXANDER, a name borne by several Macedonian princes and others, but rendered chiefly illustrious as the designation of the son of Philip of Macedon by his wife Olympias. Born about 356 B.C., Alexander enjoyed in youth the advantage of the instructions of Aristotle, and showed, at the age of fifteen, the well-developed qualities of a commander and prince. When he succeeded to the throne, he first brought to submission the states around him, and then looked abroad for a wider field wherein to gratify his boundless ambition. Persia was the quarter to which his eyes naturally turned; and after arousing the Greek republics to join him, he marched into Asia. On the banks of the Granicus he defeated the Persian monarch, Darius, and in a second engagement the latter lost his life. Asia Minor, Tyre, Egypt, Media, Syria, and Persia, succumbed in turns to the conquering Macedonian, and he even pushed his victories beyond the Indus. Returning to western Asia, he perished suddenly at Babylon, either through poison or excesses in drinking. The extent of Alexander's conquests has amazed posterity; and the marvel has not been lessened by the fact, that his possession of the territories overrun by him was not temporary, but laid the foundation of many new kingdoms for his successors. Great virtues and great vices were mingled in Alexander's character. One striking proof of his transcendant talents is, that during his life he ruled with ease the numerous and able chiefs who, at his death, disdained to stoop to any other man, and showed each the capabilities of a great ruler. They originated so many separate kingdoms as to change the face of the world.

ALEXANDRIA, a city of Egypt, founded by Alexander the Great, famous for its lighthouse, its learned men, and its two splendid libraries, successively destroyed by Augustus Cæsar and the Caliph Omar.

AMALTHEA, the reputed nurse of the god Jupiter, whom she fed with goat's milk. Some mythologists say that she herself was a goat, and her horn is often termed the Horn of Plenty.

AMAZON.—The Amazons are said to have been a tribe of Thian women, who did not allow men to live with them, killed the majority of their male children, and trained their female offspring to war, burning off their right breasts for the better use of the bow. Whether an imaginary race or not, the word Amazon has become a proverbial designation for a woman of masculine habits and temperament.

AMMON, a name under which Jupiter was worshipped in Egypt. An oasis in the deserts bordering on the Nile contained a famous temple and oracle of Jupiter Ammon, the ruins of which are still discernible.

AMPHICTYON, a person who founded a general council for the twelve leading states of Greece, and from whom such assemblages were permanently called Amphictyonic councils.

AMPHION, an individual of semi-divine origin, who founded Thebes, in whole or part, and is stated to have excelled so much in music as to have moved the stones voluntarily to take their places in the structures of the new city.

AMPHITRYON, husband of Alcmena, the mother of Hercules by Jupiter. An expression of Moliere in a play on this subject, "l'Amphitryon où l'on dine," has caused a hospitable dinner-giver to get the familiar name of an Amphitryon.

ANACREON, a bard of Ionia, whose graceful verse is devoted to love and wine.

ANDROMACHE, wife of Hector and mother of Astyanax, celebrated by Homer for her conjugal affection and domestic virtues.

ANDROMEDA, daughter of an Ethiopian king, who, being chained to a rock, and exposed to a sea-monster, was rescued from that peril by Perseus, son of Danäe, and, by promise, became his wife.

ANTÆUS, son of the Earth and Sea, a Libyan giant, slain by Hercules. When a man seems to derive fresh vigour from an overthrow, he is compared to Antæus, because, at every fall, his mother earth gave that giant fresh strength; and Hercules only foiled him by holding him up, and squeezing him to death.

ANTINÖUS, a friend of Adrian, whose form, as represented by ancient sculptors, has become significant of a peculiar description of physical beauty.

ANTONIUS (MARCUS), a Roman, who shared for a time the empire of the world with Augustus Cæsar. Antony was a follower of Julius Cæsar, and when that great leader was slain by Brutus and Cassius, he joined Augustus Cæsar in pursuing the conspirators to the death, when the two victors acquired almost uncontrolled dominion. Antony fatally revenged himself, at the same time, on Cicero, who had always been obnoxious to him. Being called to the east, he became enamoured of the beautiful but licentious Cleopatra, queen of Egypt, and passed years with her in luxurious inactivity. Roused by some proceedings of his colleague in power, Augustus Cæsar, Antony would have gone to war, but peace was restored by his marriage with the sister of Cæsar. He soon left this lady, however, to return to the east, where Cleopatra again threw her fetters around him. The consequence was an open and decisive war between the two lords of the world. Antony was vanquished at Actium, and fled to Egypt, where he committed suicide, and was followed in the same course by Cleopatra. Mark Antony was, in a measure, a Roman Alcibiades. Elegant in person, and engaging in manners, an admirable speaker, and distinguished equally for skill and endurance in war, he was at the same time a man of unbounded profligacy, and stained with every species of vice and crime.

ANUBIS, an Egyptian idol, represented with the head of a dog.

APELLES, a native of the isle of Cos, usually regarded as the greatest of the ancient painters. He followed for a time the fortunes of Alexander.

APICIUS, a noted Roman epicure, who expended

£800,000 on his appetite, and finally killed himself in fear of want, the £80,000 which still remained to him at the time being insufficient to sustain the proper rate of gourmandizing extravagance.

Apis, a god of the Egyptians, venerated under the form of a white bull.

Apollo, the son of Jupiter and Latona, god of the sun, music, medicine, and the fine arts. Born in the isle of Delos, he soon after slew the serpent Python, sent by Jupiter's wife to plague Latona, and thus gained for himself the name of the Pythian Archer. A noble ancient statue, existing in Rome, and splendidly described by Lord Byron, gives an image of him in this character. He is usually pictured as a beardless youth, holding a bow or lyre. Like others of the mythological deities, he is said to have had many amours with the daughters of earth, and even to have dwelt there for nine years as a shepherd, when expelled from heaven by his sire. The chief supplementary names given to him in poetry are, the Delian, Cynthian, Delphic, and Lycian god; and, as sun-god, he is commonly named Phœbus. His principal temples and oracles were at Delphi, Delos, and Claros, the Delphic one being the most renowned oracle of the earth. A youth of fine form is often styled an Apollo, and the poets allude endlessly to the god as their patron and guardian.

Aquarius, or the Waterman, the eleventh sign of the zodiac.

Arachne, a woman of Colophon, so well skilled in needle-work that she challenged competition with Minerva, and being defeated, hanged herself, on which the goddess changed her to a spider.

Arcadia, a pastoral region in the centre of the Peloponnesus, so much distinguished for natural beauty, and for the happy and simple life of its population, that the word has long been used to signify a scene of rural and inartificial enjoyment.

Archimedes, a geometrician of Syracuse, of great abilities. Among his other inventions, he is said to have discovered a mode of setting fire to ships from a distance by means of burning glass, a feat which Buffon proved to be not impracticable. When his sovereign suspected a tradesman of having used some alloy in making a golden crown, Archimedes was applied to in order to discover the truth. At a loss at first, the philosopher finally ran out of his house towards the palace, crying, *Eureka* (I have found it), the idea having occurred to him of immersing the crown in a vessel of water, and measuring what quantity of liquid ran over. He was killed at the siege of Syracuse, and, though interred with honour, the spot where he lay remained long unknown, till discovered by Cicero. Archimedes also invented the pumping-screw. A small part only of his writings is now in existence.

Archipelagus (Archipelago), a name given to any sea studded with islands, as the Grecian or Indian Archipelago.

Archons, the ancient title of the chief magistrates of Athens.

Arcturus, a star near the tail of the Great Bear.

Areopagitæ, the judges of the Areopagus, a seat of justice on a mount near Athens.

Arethusa, a nymph of Diana's train, changed by her mistress into a Sicilian fount, to preserve her from the pursuit of the Grecian river-god, Alpheus. The waters of the latter, however, were fabled to pass under the seas to join the fount.

Argo, a famous ship of antiquity, which is said to have carried Jason and a renowned body of Greeks (called the Argonauts to Colchis, a district on the eastern shore of the Black Sea, in quest of a Golden Fleece, surreptitiously taken from the Greeks. Numerous writers have treated of this subject. By many, the Argo is styled the first ship ever built.

Argus, a being with a hundred eyes, set by Juno to watch an earthly mistress of Jupiter, and slain by Mercury. A jealous custodian often receives the title of an Argus.

Ariadne, daughter of Minos, king of Crete, who, when the Athenian prince, Theseus, was shut up in the celebrated Cretan labyrinth to be devoured by a monster, gave him a clue of thread by which he extricated himself. The Clue of Ariadne has become a byword. Being cruelly abandoned by Theseus, Ariadne, according to the poets, gained the love of the god Bacchus, and by him was elevated to a place among the constellations.

Aries, the sign of the Ram.

Arion, a famous musician, who, when in peril of his life at sea, played so sweetly that some grateful dolphins bore him safely ashore.

Aristides, a statesman and warrior of Athens, whose conduct earned for him the title of the *Just*. He died virtuously poor.

Aristophanes, a famous comic satirist of Athens.

Aristotle, a Greek philosopher of the first rank, born at Stagyra, in Macedon, and hence called the Stagyrite. After studying under Plato, who valued him so much as to style him the *mind* of the school, Aristotle opened a seminary of his own, and long taught with great success. From his lecturing to his pupils while walking, they received the name of the Peripatetics. Aristotle also spent ten years as the tutor of Alexander the Great, who said that "Philip had given him life, but Aristotle had taught him to live well." By the aid of this prince, the philosopher was enabled to produce his "History of Animated Nature," describing from collected specimens. He also wrote on Physics, Metaphysics, Ethics, Logic, Rhetoric, and Criticism. His canons on the latter subject are yet held in high respect. Compelled to leave Athens, Aristotle died at Chalcis, at the age of sixty-five. His works prove his intellect to have been one of extraordinary acuteness.

Arria, wife of the Roman Poetus, famous for stabbing herself and saying, "Oh, Poetus, it is not painful!" when her husband hesitated to free himself in the same manner from his woes.

Ascanius, son of the Trojan Æneas, and successor to his power in Italy. The young inheritor and hope of a house or party is sometimes designated by this title.

Aspasia, a celebrated courtesan of Athens, mistress and ultimately wife of Pericles, and so eminent for her intellectual accomplishments that even modest women resorted to her to enjoy her instructive converse.

Astræa, the goddess of Justice in the classical mythology.

Atalanta, a princess of the isle of Scyro, of great beauty, and determinedly averse to matrimony. As she excelled in running, she consented to wed him who foiled her in a trial of speed, and defeated all her lovers, until one came forward who was favoured by the goddess of love. From that deity he received three golden apples, and was directed to throw them down at intervals in the race. The stratagem succeeded. Atalanta could not refrain from stopping to pick up the apples, and the lover obtained her hand. But, for subsequent disrespect to Jupiter, the pair were changed into a lion and lioness. The race of Atalanta is often alluded to.

Ate, the goddess of Evil.

Athos, a mountain of Macedonia, which a sculptor proposed to cut into a vast statue of Alexander the Great.

Atlas, a Titan or giant who warred with Jupiter, and was ultimately changed into the mountain, or chain of mountains, of the same name in Africa, which, from their height, were supposed to support the heavens. Hence the frequent allusions to the load of Atlas.

Atreus, king of Argos, who, having cause of offence against his brother Thyestes, caused the latter unwittingly to eat the flesh of his own children. The son of

Thyestes revenged this deed by slaying Agamemnon, the son of Atreus. The whole history of this family was a subject of horror and frequent allusion among the Greeks.

Atropos, one of the Fates or Parcæ, whose task it was to cut the thread of life.

Attica, a district of Greece, lying south of Bœotia, and west of the Ægean Sea. It was supposed to be so peculiarly favourable to genius, and its dialect to be so pure, that the phrase of "Attic wit" or "salt" became indicative of the highest literary merit, as garrets got the name of "Attics" from writers being too often the inhabitants of such poor places in times not far distant.

Atticus, an intimate friend of the orator Cicero, and a man pre-eminently distinguished by the superior qualities of his head and heart.

Aventinus, one of the seven hills on which Rome was built.

Avernus, a lake of Campania, so unwholesome and putrid that the ancients made it the entrance to the infernal regions.

Augeas, king of Elis, whose vast stables for oxen and goats were so overrun with filth that it was deemed impossible to cleanse them, until Hercules effected the task by turning a river into them. Difficult cases of purification or reformation are proverbially compared to this feat of cleaning the Augean stables.

Augurs.—The Augurs of Rome were officials who foretold events by sacrifices and divination.

Aurora, the goddess of the Morning, usually represented as drawn by two horses in a rose-coloured chariot. She was called sister to the sun and moon, and mother of the winds and stars.

Autolycus, a famous thief of antiquity, whose name is sometimes bestowed on the members of the same craft.

Babylon, the capital of Assyria, a city of vast size in early times, with walls 60,000 paces in circumference, 200 feet high, 50 feet in thickness, and in their circuit 100 brazen gates. Hanging gardens of great extent, the temple of Belus, and an artificial lake 160 miles in circumference, with large canals, were among the other wonders of the place.

Bacchantes, priestesses of Bacchus, who did honour to the god of wine by the most frantic and licentious orgies.

Bacchus, god of wine, son of Jupiter by Semele, who, being a mortal, fell a victim to her vain wish of seeing her lover in all the blaze of his divinity. Jupiter rescued her unborn child from the same fate, and placed him in his own thigh, until grown to infant maturity. Bacchus, in his adult state, underwent many adventures, according to the poets. He made an expedition to India with his bacchanalian followers, and made an easy conquest of the intermediate nations, teaching them the use of the vine. As Bacchus the conqueror, he is painted as drawn in a chariot by a lion and a tiger; and in other circumstances he is represented as a plump, smooth-skinned young man, with a crown of vine and ivy leaves, and a thyrsus or rod in his hand. His common names, besides that mentioned, are Iacchus, Liber, Bromius, Lyæus, and Evan. The rites in his honour were called Bacchanalia.

Baucis, a poor old woman of Phrygia, with her spouse Philemon, received Jupiter so kindly that he made their house a splendid temple, and created them his priest and priestess. Allowed to die together at their request, they were converted into trees. Dryden and Swift tell this story in verse.

Bavius and Mævius, two inferior and malevolent poets in the time of Augustus Cæsar, whose names have become a by-word for all envy of superior merit.

Belisarius, an able general of the Constantinopolitan emperor, Justinian, reduced to beggary in his old age, and afflicted with blindness. "*Date obolum Belisario*" (Give the smallest coin to Belisarius), the usual petition of the fallen soldier, has become proverbial.

Bellerophon, a son of the king of Ephyre, who, having committed an act of violence, fled to the court of Prœtus, king of Argos, where the queen fell in love with him, and, finding herself slighted, accused him to her husband. The latter sent Bellerophon to Lycia with sealed letters, desiring that the bearer should be put to death. The Lycian king sent his guest, with this view, against a monster called the Chimæra, but receiving from Minerva a winged horse called Pegasus, Bellerophon overcame the monster; and after other trials, ultimately wedded the daughter of the Lycian monarch. From this story, all letters unfavourable to the bearer have been called Letters of Bellerophon.

Bellona, sister and charioteer to Mars, the god of war.

Berenice, a name borne by several Egyptian princesses, one of whom was noted for her beautiful hair, which was placed by her in the temple of Venus. Being lost, the locks were said by the court-astronomers to have been turned into a constellation.

Bias, one of the seven wise men of Greece.

Boadicea (or Bendicea), queen of the Iceni ans, a tribe of South-Britons, who took up arms to avenge the outrages of the Romans, but, in spite of her undaunted conduct in the field, was vanquished by them, and poisoned herself.

Bœotia, a district of Greece, now forming part of Livadia, and lying between Phocis and Attica. Partly from an idea that the atmosphere of the region was peculiarly thick, the inhabitants gained a reputation for stupidity which has yet adhered to their name. Yet Pindar, Plutarch, and others of the brightest spirits of Greece, were Bœotians.

Boötes, a northern constellation near Ursa Major.

Boreas, a title of the north-wind.

Bosphorus, the early name of the strait of Constantinople.

Briareus, a famous gisnt with fifty heads and a hundred hands, son of the Heaven and Earth.

Brutus (Lucius Junius), a noble Roman, who, in the days of the last king of Rome, feigned himself an idiot to ensure his safety, but threw off the mask, and overturned the royal authority, when Lucretia fell a victim to the brutality of the son of Tarquin. When the sons of Brutus afterwards conspired to restore the Tarquins, he himself, as consul, was called upon to act as judge, and his high-minded victory over parental feeling has made his name immortal. Brutus (Marcus Junius), descendant of the preceding, who emulated his virtues and his fame. When the power of Julius Cæsar became dangerous to the liberties of Rome, Marcus Brutus, though one of his warmest personal friends, rose against him, and united with Cassius and others in stabbing him in the Capitol. Cæsar, as he received the last blow, uttered to him who dealt it the memorable words, "Et tu Brute!" (Thou, too, Brutus!). The friends of Cæsar were avenged at Philippi, where the chief conspirators fell; and Plutarch tells that Brutus was forewarned of the event by the spirit of Cæsar, which appeared in his tent, and said, "I will meet thee again at Philippi"—words often used to convey an indication of coming evil.

Bucephalus, a horse tamed by Alexander the Great in youth, and which became so renowned for bearing him in the field of battle as to give a common name to all spirited animals of its species.

Busiris, an Egyptian king, who followed the shocking custom of sacrificing strangers.

Cacus, a renowned robber of Italy, who, being descended from Vulcan, could defend himself by emitting fire and smoke; but being detected in stealing cows, though he dragged them backwards to prevent discovery Hercules, the owner, strangled him by main force

Cadmus, a prince of Phœnicia, who generally receives the credit of inventing letters, or at least of introducing them into Greece. Though some writers ascribe the erection of Thebes to Amphion's music, others term Cadmus its founder. Ere he could do so, he killed a dragon which had devoured his companions; and from the teeth of this monster, when sown in the earth, a band of armed men sprung up. These fought among themselves, till only five were left to assist Cadmus in building the city. The sowing of the teeth and its consequences are often alluded to, and form an apt comparison when the germs of strife are planted in any instance.

Caduceus, a rod entwined at one end by serpents, and which served as the rod of power and office of the herald-god Mercury.

Cæsar, an illustrious name in history, first given as a surname to the Julian family of Rome. Caius Julius Cæsar, who gained for the family supreme power, was born in the year 100 B.C., and early distinguished himself by his eloquence, his captivating manners, and generous habits of life. His military commands lay in succession in Spain and Gaul, whence he passed over into Britain, then an unknown land. The successes of Cæsar created jealousies betwixt him and Pompey, another renowned soldier of Rome, and to seek satisfaction from whom the governor of Gaul resolved to march homewards, despite the commands of the senate. The stream of the Rubicon was the boundary of his province; he crossed it, and in so doing, threw off his allegiance to the authorities of the republic. Italy and Rome quickly succumbed to him, and he finally overthrew Pompey on the plain of Pharsalia. The patriot Cato then resisted him on his way to uncontrolled power, but fell likewise before his triumphant fortunes. Cæsar was named perpetual dictator; but was slain by Brutus and others in the height of his glory when he had reached the age of fifty-six. The passing of the Rubicon has been long a by-word for the taking of any decisive and irretraceable step; and Pharsalia is a term applied to any scene where a great cause has been lost, for in that battle fell the Roman liberties. Cæsar wrote in an able and modest manner the annals of his own campaigns. Cæsar (Octavius, afterwards named Augustus), nephew of Julius Cæsar, and his successor in power. After avenging the death of his uncle, Augustus became a member of a triumvirate who ruled the world, and subsequently divided authority with one man, Mark Antony, after whose death he stood "sole monarch of the universal earth." Of a less noble character than Julius Cæsar, the first Roman emperor, as Augustus was entitled, was possessed of sufficient talent, caution, and prudence, to hold his sovereignty undisturbed in a most precarious time. Nor was he without virtues. From his patronage of literature, its palmy periods have ever since been compared to the Augustan age. The title of Cæsar, specially given to the first twelve emperors (commencing with the dictator, Julius Cæsar) who sat on the Roman throne. The name of Cæsar was also assumed by later Roman emperors, and both the kaisars of Germany and the czars of Russia owe their designation to the same source.

Caligula, the fourth of the twelve Cæsars, who derived his name from his habitually wearing the *caliga* or military boot of the age, and made himself noted as a cruel and senseless tyrant. From mere wantonness he made his horse high-priest and consul of Rome; and he spilt blood without cause and without remorse. He died a violent death.

Calliope, one of the Muses, who presided especially over eloquence and heroic poetry.

Calypso, a beautiful goddess who, according to Homer, dwelt on an island of the earth, and who received Ulysses hospitably as he wandered home from Troy. Her story forms an exquisite episode in the Odyssey.

Camilla, queen of the Volsci, who fought against Æneas, and is described as having been so swift of foot that she could fly over a field of corn without bending the blades. Pope, and the later poets generally, have adopted her as the type of female speed in running.

Campus Martius, a plain near Rome, used for the military exercises of the youth of the city.

Capitolium, the citadel of ancient Rome, founded on the Tarpeian rock, and containing also a temple, from which Jupiter was named Capitolinus. The capitol was a noble structure, occupying four acres of ground, and accessible by a hundred steps. The Romans held it in peculiar veneration, and it was the scene of all their triumphal processions. By the cackling of geese the Romans were once roused to the protection of their capitol, and this is often alluded to when slight means serve great ends.

Capricornus, a sign of the Zodiac, so termed from some resemblance in the arrangement of its twenty-eight stars to a goat.

Carthage, a great maritime and republican city of Africa, founded about 900 years B.C., by the Phœnician princess Dido, and long the rival of Rome. Carthage existed for upwards of 700 years, and possessed during its palmy days a great part of Africa on the Mediterranean, as well as Spain, Sicily, and Sardinia. Its generals, and particularly Hannibal, pressed Rome so severely, that Cato, one of the wisest of the Romans, pronounced its destruction indispensable. His words, *Delenda est Carthago* (Carthage must be destroyed), have become proverbial. The power of the African republic was at last overthrown by Scipio Africanus, and the city ruined by fire. The Romans, in their hate, used to call the Carthagenians all that was treacherous; and, from one of the names of the latter people, *Punica fides* (Punic faith), was made by their foes a lasting synonym for "faithlessness."

Cassandra, a Trojan princess, who is said to have received the gift of prophecy from Apollo, but having afterwards slighted the god, was doomed by him to have all her predictions disbelieved. When she foretold the fall of Troy, accordingly, she was deemed insane. An unheeded prognosticator of evil is hence termed a Cassandra.

Castalia, a Parnassian fount, sacred to the Muses, and a fertile theme of poetical allusions.

Castor, son of Leda, whom the enamoured god Jupiter is said to have wooed in the form of a swan. Leda bore at once two sons and two daughters, Castor, Pollux, Clytemnestra, and Helena, of whom the second and fourth were deemed children of Jupiter, and the other two of the husband of Leda. Pollux, on being elevated to a star, exhibited his love for Castor by seeking for the latter a share of his immortality, and it was granted to them to live six months alternately. They were famed for horsemanship.

Catilina (Sergius), a noble Roman of great talents, but infamous character and habits. To gratify his ambition, avarice, and revenge, he rebelled against his country, but was overcome and slain in battle. The name of Catiline is used to express all that is evil in the character of a conspirator and liberticide.

Cato, a name borne by several illustrious Romans. Cato surnamed the Censor, was famous for his valour, temperance, wisdom, and eloquence. He studied and acquired the Greek tongue at the age of eighty. Fragments of his compositions yet exist. Cato, surnamed Uticensis, was the great-grandson of the Censor, and made himself celebrated by his patriotic resistance to the usurpations of Julius Cæsar, to avoid falling into whose hands he ultimately stabbed himself, after reading Plato on the Soul's Immortality.

Catullus, a Roman poet, whose pieces have much sweetness and feeling, though occasionally marked by immorality.

Censors, two important Roman magistrates, who had the care of the manners and morals of the people.

CENTAURI, a monstrous people of Thessaly, described as having the head, chest, and arms of men placed on the trunks of horses. A band of them being invited to a wedding-feast of the Lapithæ, a quarrel ensued, and a fearful battle took place, in which Hercules and Theseus peculiarly distinguished themselves in combating and defeating the Centaurs. Many sculptors, from the Greeks to the moderns, have used the chisel on this subject, which is, indeed, rich in the picturesque. The first use of horses for riding seems to have originated the fable of the Centaurs, but Pliny actually states that he saw one embalmed!

CEPHALUS and PROCRIS, a wedded pair, who, having each tried the other's fidelity by disguises, found that human nature is frail, and became content and happy. But Procris, uncured of jealousy, followed her husband one day to the chase, and was accidentally slain by him. The story of these lovers is often told and alluded to by the classical poets.

CERBERUS, a dog with three heads, guardian of the Infernal gate. Watch-dogs, nay, guardian bipeds, frequently receive this name.

CERES, the goddess of corn and harvests, daughter of Saturn and Vesta. She was worshipped everywhere for her bounties, having taught Triptolemus of Eleusis all the arts of agriculture, and sent him to disseminate them over the earth. At Eleusis, she also established the famous rites called the Eleusinian Mysteries. Her daughter Proserpine having been carried off from Sicily, while gathering flowers, by Pluto, king of the shades, Ceres sought her long in vain; and when she was discovered, could only obtain permission to have her half the year in heaven. This is understood to allude to the changes of the moon. Ceres is represented with a garland of corn on her head, and is placed either on the back of an ox or in a chariot drawn by dragons. Her festivals were called Cerealia, and a sow with young was usually sacrificed to her, as being an enemy to fields of grain.

CHAOS, the rude shapeless mass of matter composing, according to the ancients, the yet unformed universe.

CHARON, the ferryman who wafted the dead over the river Styx into the regions below. As the boatman demanded a "consideration" for his services, it was customary for the ancients to place a small coin below the tongues of the dead.

CHARYBDIS, a deep whirlpool in the Sicilian seas, opposite to the rock Scylla. The combined dangers of both led to the well-known saying—"*Incidis in Scyllam, cupiens vitare Charybdim*" (Shunning Charybdis, you on Scylla strike), which is familiarly applied in the same sense as the Scottish proverb, "Out of the frying-pan into the fire."

CHIMÆRA, a fabled monster killed by Bellerophon, which had a triple head, composed of those of a goat, a lion, and a dragon, and which breathed flame. Any monstrous thing of fancy is now termed a Chimera.

CHIRON, a centaur skilled in music, medicine, and other arts, which he taught to Achilles, Æsculapius, Hercules, and others.

CICERO (MARCUS TULLIUS), an orator of Rome, whose speeches against Catiline, Antony, and others, remain imperishable monuments of his powers. His eloquent denunciations saved Rome from the tender mercies of Catiline, and he was termed by the people *the father of his country*. After serving the state in the highest situations at home and abroad, and suffering exile for his attacks on the bad, he took the side of Pompey against Cæsar; but the latter, on becoming victor, treated Cicero with much respect. However, when Cæsar was slain, Antony, the bitter foe of the orator, acquired a fatal degree of power. At length, Antony despatched assassins on the track of Cicero, and soon after his bleeding head was brought to Rome, where the wife of the master-murderer tore out the once persuasive tongue in remorseless spite. Besides his orations, various other productions of Cicero still remain to testify to the splendour of his talents.

CIMMERIAN, a local epithet for the natives of the district now called the Crimea, and some parts of which were thought to be so dark that "Cimmerian gloom" has become a proverbial phrase.

CINCINNATUS, an illustrious Roman, who was taken from the plough, which he left with regret, to serve and save his endangered country. His task fulfilled, he again contentedly retired to his farm.

CIRCE, a witch of semi-divine origin, whose irresistible enchantments drew many into her power, only to be changed, after a short career of voluptuousness, into filthy swine. Circe is evidently an emblem of debasing pleasure.

CIRCUS, the place where shows were exhibited at Rome.

CLEOBULUS, one of the seven wise men of Greece.

CLEOPATRA, a name borne by several princesses of Egypt, and rendered particularly famous by one whose surpassing beauty enslaved Mark Antony, and led to his ruinous contention with Cæsar Augustus. When Antony fell, Cleopatra applied an aspic to her breast, and died from its venomous bite. As voluptuous as beautiful, this queen is generally held as the type of these combined characteristics.

CLIO, the muse who presided over history.

CLOACINA, a goddess to whom the Romans assigned the care of all the refuse of their city.

CLOTHO, one of the Fates, who held the distaff from which was spun the thread of life.

CLYTEMNESTRA, wife and murderess of Agamemnon, and the victim of her own son's revenge.

CODRUS, an Athenian king, who, prompted by an oracle, gave up his life to save his country.

COLOSSUS, a brazen image placed with its feet on the two moles of the harbour of Rhodes, and of such magnitude that ships passed easily between its legs. It was 105 feet high, and was deemed one of the seven wonders of the world. The term has become firmly established in modern languages.

CONSUL, the highest Roman magistrate. This office was held annually and conjunctly by two individuals, who conducted the wars of the state, presided over the senate, and held, in short, nearly absolute power.

CORINTH, a famous city of Greece, situated on the isthmus between the Gulfs of Ægina and Lepanto, and remarkable in classical times for its power and opulence. *Corinthian brass* is frequently alluded to, and is said to have been an alloy accidentally formed when the city was burned by the Romans in the second century, A. D. The common adage, "*Non cuivis homini contingit adire Corinthum*"—(It is not every man's luck to visit Corinth), is supposed by Suidas to refer to its difficulty of access by sea.

CORNELIA, a noble Roman lady, who, though her sons were put to death for their turbulence, was so proud of them that it was her boast to be simply named "The mother of the Gracchi." The phrase has long been a familiar allusion.

CORYDON, a name in Virgil's pastorals, often applied to shepherds.

CORYPHÆUS (or CHORYPHÆUS), a title formerly given to the leaders of choral bands, and now frequently assigned to leading men of any description.

CRETE.—The island of Crete was chiefly renowned of old for its labyrinth, laws, luxury, and lies. The name of a Cretan, indeed, became a by-word for falsehood.

CRŒSUS, a king of Lydia, supposed to be the richest of mankind, and desirous of being thought the happiest. Solon, the Athenian philosopher, told him that wealth did not insure happiness, and that no man could be safely called happy before death. Crœsus disliked this

plain speaking, but, when overcome by Cyrus, and led out to execution, he acknowledged aloud its truth. Struck himself by the circumstance, Cyrus pardoned. Crœsus is a common synonym for a very opulent man.

Cupid, god of love, and son of Venus, queen of beauty. He is represented as a winged infant, naked, and armed with a bow and arrows.

Curtius (Marcus), a young Roman of high military fame, who, when a wide gap opened in the forum, armed himself, mounted his horse, and leaped into the gulf, which instantly closed behind him. To this renowned act of patriotic devotion he was incited by the oracle, which indicated that the sacrifice of a life of price could alone remedy the calamity.

Cybele, a goddess worshipped with many mystic rites, and usually painted with a turreted crown, keys in her hand, and a lion-drawn chariot.

Cyclops, are a race of one-eyed giants, who acted as assistants to the smith-god Vulcan, and devoured human being One of the cyclops, named Polyphemus, appears prominently in the Odyssey.

Cyprus.—The island of Cyprus, from its luxurious fertility, was supposed to be the residence of the goddess of beauty and pleasure, and from this cause the epithet "Cyprian" has acquired a licentious meaning.

Cythera, an island off the Morea, sacred to Venus, and from which she is often called Cytherea, or the Cytherean goddess.

Dædalus, an Athenian of great skill in the mechanical and fine arts, to whom some ascribe the invention of the wedge, the axe, the wimble, and the level. He is said also to have formed the many-pathed labyrinth of Crete, in which he himself was ultimately confined with his son Icarus. Not being able to get out of his own trap, he made wings for himself and Icarus, with which they flew away; but the too-daring youth rose so near the sun that the waxen fastenings of the wings melted, and he fell into the sea. Dædalus is the nominal prototype of all ingenious mechanics.

Damocles, a courtier, who, having loudly flattered Dionysius of Sicily on the score of his wealth and fortunate greatness, was placed, for a time, by way of trial, upon the tyrant's throne. Damocles gazed a while with delight on the splendour around him, but, looking up, he saw a sword suspended above his head by a single hair, and his fancied happiness vanished. This incident is often referred to in illustration of the perils and turmoils of greatness.

Damon and Pythias, two friends of such constancy, that when the former of them was doomed to die, and sought for a respite, that he might go home and settle his affairs, the latter offered his life as a security for the return of the other. Damon returned, even to his friend's regret. The scene betwixt them was so moving that it led to a pardon.—Damon is a common name for a swain, being much used in the old pastorals.

Danae, the daughter of a king of Argos, was shut up in a tower because it was foretold that a son of hers should kill his grandfather. The god Jupiter, however, introduced himself in the form of a golden shower, and Danaë bore to him Perseus, with whom she was exposed at sea in a slight bark, and who afterwards accidentally killed his grandfather with a quoit.

Danaides, the fifty daughters of King Danaüs, who, to prevent the fulfilment of an oracle of fatal import, caused them to murder their husbands. All obeyed but one, and, for the crime, they were condemned perpetually to the fruitless task of filling a sieve with water in the infernal regions.

Daphne, a nymph, who, when flying from the enamoured pursuit of Apollo, was converted into the laurel-tree.

Delphi (now Castri), a town of Phocis, situated on the side of Mount Parnassus. The place was especially sacred to Apollo, both as the god of Poetry and Divination, and here stood the most famous of the Greek temples and oracles. The decrees of fate were expounded by a priestess, called the Pythia or Pythoness, who stood on a tripod while under the inspiration of a god. The convulsions which she then seemed to labour under have been held real by some, and ascribed to an asphyxiating vapour issuing from the earth at the spot.

Delta, a Greek letter of triangular shape (Δ), the name of which was given formerly to the alluvial land lying between the outlets of the Nile, and is now applied to the mouths of other streams.

Democritus, a personage called the laughing philosopher, from his deeming it better to smile than to weep at the follies of mankind.

Demosthenes the greatest of the ancient orators. An Athenian by birth, he was early seized with an ardent desire to excel in speaking; and though he had many natural disadvantages to contend with, he overcame them all. He cured a habit of stammering by placing pebbles in his mouth; he inured himself to the turbulence of a popular auditory by speaking on the seashore during storms; and he removed the distortions of his visage by delivery before a mirror. He shut himself up, moreover, to indulge in study; and over the midnight lamp were composed those sublime orations which yet remain without parallel, and by which he wielded at will the fierce democracy of Athens. His greatest efforts, when he had raised himself to power, were directed against Philip of Macedon; and from the title given to his harangues on this subject, similar attacks are yet commonly termed Philippics. The Macedonians ultimately triumphed, however, and Demosthenes escaped from his enemies by taking poison in the sixtieth year of his age.

Deucalion, a prince of Thessaly, who, with his wife Pyrrha, alone escaped, by means of a ship, from a great deluge said to have occurred in their time. The vessel rested on Parnassus, and Deucalion, directed by an oracle how to repeople the earth, threw stones over his shoulder, which instantly became men. Pyrrha did the same, and women were formed.

Diana, sister of Apollo, goddess of hunting, and in heaven called Luna, or the Moon. She was represented in the garb of a quivered huntress followed by dogs, and was a renowned patroness of maiden chastity, though she is said to have fallen in love with Endymion, a young man of Latmos, as he lay asleep, and even to have wedded him. She had eighty nymphs who attended her in the chase. The most famous temple of Diana was that at Ephesus, called one of the seven earthly wonders, and set fire to by one who sought thereby to gain an immortal name. Diana is often called Cynthia, or Delia, from the place of her birth; and, in the character of the moon, is usually termed Phœbe.

Dido, a Phœnician princess, who founded Carthage, and, while it existed, was worshipped in that city. Æneas, after wooing Dido, deserted her, and her memory has become associated with the idea of a forlorn woman.

Diogenes, the type of all sour, snarling philosophers. He was of the Cynic sect, and so despised luxury as to live in a tub. Many of his sayings are frequently quoted; as, for example, his answer to Alexander the Great, when that prince asked him what he could do to oblige him. "Stand away from betwixt me and the sun," said Diogenes.

Dionysius (the elder), tyrant of Sicily, who, amongst other characteristic deeds, constructed a cave commonly called The Ear of Dionysius, which was of such a form that every word uttered by his prisoners in an adjoining prison could be heard by him.—Dionysius, son and successor of the preceding, and so apt an imitator of his cruel practices that he was finally driven from his throne

and, to earn his bread, was compelled to teach a school at Corinth, whence fallen despots are often compared to him.

DIS, a name used by the poets for Pluto.

DODONA, a town of Epiro, and the site of an oracle of Jupiter whose responses were frequently delivered by or among the sacred oaks of the neighbourhood.

DOMITIAN, a Roman emperor, proverbial for his cruelty.

DRACO, a lawgiver of Athens, whose statutes were so severe that it was said they were written in blood. Harsh edicts are often compared to them.

DRYADES, nymphs fabled to preside over the woods.

ECHO, a nymph, whose powers of speech, as a punishment for prating, were limited to the answering of questions. Falling afterwards in love with Narcissus, that youth's cruelty caused her to pine away, and she was changed to a stone, which still retains the power of speech.

EGERIA, a nymph or deity from whom Numa, king of Rome, pretended to receive counsel in secret on affairs of state.

ELEUSIS, a city of Attica, the chief scene of the celebration of the Eleusinian Mysteries. Initiation into these was one of the most solemn of all the mythological rites of Greece, and was supposed to confer high privileges. The nature of the ceremonial is now a mere matter or conjecture.

ELYSIUM, the happy seat of the departed spirits of the good, according to the Greek and Romans. The pleasures said to be enjoyed there were in some respects pure and refined; but in others, the tastes of the living humanity of the age were too grossly intermingled with the views taken of Elysian enjoyments. As among the Indians, for example, warriors sought in hunting animals a substitute for the pleasures of fighting.

EMPEDOCLES, a man of superior talents, who, wishing to be deemed a god, leapt into the crater of Ætna, thinking that he might so conceal his having been subject to death like common mortals. But his sandal was thrown up, and frustrated his insane ambition.

ENDYMION, a youth of Latmos, beloved of the moon.

EPAMINONDAS, a Theban chief, one of the most noble characters in Grecian history. A great and victorious soldier, he was even more conspicuous for virtue, wisdom, temperance, and patriotism.

EPICURUS, a celebrated philosopher of Attican descent, whose name has most unfairly become a synonym for a sensualist of a gross kind. His philosophy was certainly based on the maxim that "Pleasure is the highest good;" but Epicurus well knew, and ever taught, that moderation in the gratification of the senses is the sole means of attaining to true and lasting pleasure, and that a "happy life" rests fundamentally on health of body and tranquillity of mind, possessions never to be won or preserved by excessive sensual indulgence. What propriety is there in a word of such etymology as the word "epicure," when the daily diet of the man whose name is so abused consisted of "barley cake and water from the spring?"

ERATO, the Muse who presided over lyric and amorous verse.

EREBUS, an infernal deity, whose name is often used to signify the supposed place of his abode.

EURIPIDES, a Greek poet, whose tragedies are marked by great tenderness and elegance.

EUROPA, a beautiful woman, to whom the enamoured Jupiter appeared in the form of a bull, and when she thoughtlessly mounted on the back of the supposed animal, carried her off. She gave name, it is further fabled, to the European continent.

EURYDICE, wife of the poet and musician, Orpheus. When she died from the bite of a serpent, Orpheus was so deeply grieved that he ventured to seek her among the shades; and having, by his music, drawn "iron tears down Pluto's cheek," was permitted by the infernal chief to take his wife back to earth, on condition that he did not turn to look on her till his arrival there. He violated the condition, and lost her for ever.

FABIUS, the name of a noble Roman house, the most illustrious member of which was QUINTUS FABIUS MAXIMUS. The alarming successes of the Carthaginian, Hannibal, who defeated in succession all who came against him, received a notable check when Fabius took the command of the Roman army. His policy was not to fight, but to wear out Hannibal, then in a hostile country; and from this circumstance Fabius received at the time the name of "The Delayer." Ever since that age, every cautious commander has been called a follower of the Fabian policy.

FAUNS.—The fauns were minor rural deities, painted as having the form of goats from the middle downwards, with the horns and ears of the same animals. They favoured agriculture, and peasants sacrificed to them.

FLORA, a goddess of the Roman Pantheon, who presided over flowers, gardens, orchards, and vineyards, and was usually painted as crowned with flowers, and holding the horn of plenty. She married Zephyrus, the god of the west wind, and received from him the privilege of immortal youth.

FORUM, the market place and also the seat of a prætorian court of justice in the Roman cities. The word is now applied to courts of justice, whence the phrase of "forensic" or legal oratory.

FURIÆ, the three Furies, named *Alecto*, *Megæra*, and *Tisiphone*. These sisters were supposed to be the ministers of divine vengeance, punishing mortals on earth both with external evils and the stings of conscience, and inflicting continued torments on the bad in the infernal regions. They were represented as holding in one hand a torch and in the other a whip of scorpions. The ancients sacrificed to them with fear and trembling.

GALATEA, a sea-nymph in love with Acis, whom Polyphemus the Cyclop killed through jealousy.

GALEN, a celebrated physician of the second century, A. D., who was greatly esteemed at Rome, and who wrote five hundred volumes, some fragments of which only are now extant. He had made many valuable discoveries in medicine, and has left a by-name to its professors.

GANYMEDES, a beautiful Phrygian youth, carried away by Jupiter to be the cup-bearer of the gods in place of Hebe. An eagle conveyed him, and he is usually pictured on the back of that bird.

GERYON, a monstrous being with three heads, slain by Hercules.

GLADIATORII LUDI.—Gladiatorial Sports, so called from *gladius* (a sword), were exhibitions at which slaves, captives, and trained fighters, butchered one another for the amusement of the people, male and female, of the city of Rome.

GORDIUS, a Phrygian peasant, who, when his countrymen were told by the oracle to enthrone the first man whom they met going to the temple of Jupiter in a car, had the good fortune to be found in that situation. Immediately afterwards he consecrated his car in the temple, tying the yoke to the draught with such art that it could not be unloosed. Then the report spread that the oracle had decreed the empire of Asia to him who should untie the Gordian knot. Coming to the place, Alexander the Great made short work of the difficulty by cutting the cord with his sword, and thereupon he claimed to be the foretold ruler of Asia.

GORGON, a name specially applied to Medusa, one of three sisters who had wings of gold, and but one eye for use among the three. The "Gorgon's head," or "Medusa's head," is frequently alluded to as significant

of an object of terror, because it was encircled with snakes, and turned the beholder to stone.

GRACCHUS, the name of a noble family of republican Rome, two members of which made themselves noted for turbulence, and gave origin to the well-known line of the poet, "*Quis tulerit Gracchos de seditione querentes?*"—(Who could bear that the Gracchi should complain of sedition?)

HALCYONE, a princess who grieved so deeply for the loss of her spouse at sea, that she was sent to that element out of pity, changed into a king-fisher. Being favoured with seven calm days for brooding, the phrase of "Halcyon days" came to denote a time of peaceful happiness.

HAMADRYADS, rural nymphs, who were said to preside over trees.

HANNIBAL, a famous Carthaginian, who, when a boy, was made by his father to vow eternal enmity to Rome. He fulfilled in due time the oath, proving the most dangerous foe ever known to the Romans. So great was the promise of his early days, that before the age of twenty-five he received the command-in-chief of all the armies of his country. In this situation he determined upon the bold step of crossing the Alps, and carrying war into the heart of Italy. His passage has ever been viewed as a wonderful military feat, and was partly accomplished, historians say, by his kindling large fires, and pouring vinegar on the heated rocks, which caused them to rend or crumble in pieces. Once in Italy, he defeated, one after another, all the commanders sent against him from Rome, and for sixteen years held that city in continuous alarm. At length the Romans sent a force to menace Carthage, and Hannibal was hastily recalled, only to be wholly vanquished near his native city by Scipio Africanus. A brief peace was granted afterwards to Carthage, but, mistrustful of his enemies, Hannibal fled to Syria, and subsequently to Bithynia, where, his person being demanded by the Romans, he ended his life by taking poison, 182 a. c. The youthful vow and acts of Hannibal meet with frequent notice in literature.

HEBE, daughter of Jupiter and Juno, and the goddess of youth, for which, in its beautiful forms, her name is a synonym. She was the first cup-bearer of the gods.

HECATE, the goddess supposed to preside over enchantments.

HECTOR, the most valiant of the sons of King Priam, of Troy, ultimately killed by Achilles. His name is applied to brave men, and not unfrequently to boastful ones, though Homer assigns none but truly great qualities to the Trojan prince.

HELENA, the most beautiful woman of her age, and whose abduction from her husband, Menelaus, king of Sparta, by the Trojan prince Paris, caused the siege and fall of Troy, all the Greek princes having united to effect her recovery. Helen was one of the children of Leda by Jupiter. She was restored ultimately to Menelaus. Allusions to her on account of her beauty, and the evils which she caused, are endless in song and story.

HELICON, a mountain of Bœotia, sacred to the Muses, who had a temple there.

HELIOGABALUS, a Roman emperor, so extravagantly devoted to the pleasures of the table that his name has become a synonym for a glutton.

HELOTS, a menial caste at Sparta, whose name has become significant of the most abject slavery.

HERCULES, the most famous personage of the heroic age of Greece. He was styled the son of Jupiter by Alcmena, and began his feats of valour in his cradle, by strangling two snakes sent by the jealous queen of heaven to devour him. Hercules performed, compulsorily, it is said, twelve celebrated labours, of which the following are examples:—He killed the terrible Nemean lion; he destroyed the Lernean hydra, a monster with many heads, each of which, when struck off, instantly grew again, till the hero thought of searing them with a red-hot iron; he cleansed the vast Augean stables by turning a river into them; and he brought the dog Cerberus from the infernal regions. Fate also compelled him to become three years a slave to Omphale, queen of Lydia, who made him handle a distaff instead of his victorious club. Finally, when his wife Dejanira was forcibly seized by the Centaur Nessus, Hercules shot him across a river with an arrow. The revengeful centaur, before he died, gave Dejanira a tunic, which he said had the power of curing conjugal infidelity, but which, when donned at her wish by Hercules, caused him to die a painful death. He was afterwards raised to a place among the gods. The many-headed hydra, the Augean stable, and Hercules subdued to the distaff, are specimens of the frequent allusions made to the story of this demigod. He is the type of physical power in painting and sculpture, and is always drawn with a mighty club in his hand.

HERO, a fair priestess of Venus, who, when her lover Leander perished in swimming across the Hellespont, threw herself into the sea. She is often painted with a torch in her hand, as a guide to the bold but unfortunate swimmer.

HERODOTUS, a famed historian of Greece.

HESIOD, a very early Bœotian poet of superior powers.

HESPERIDES, three celebrated nymphs, who, with a dragon for a watch-dog, were intrusted with the care of Juno's golden apples, placed in a garden, it was said, in the neighbourhood of Mount Atlas. Hercules, in one of his labours, carried off some of this much-prized fruit. This story of the apples of the Hesperides is often used, by way of comparison, to signify things of difficult access and great rarity and price.

HESPERUS, a name given to the planet Venus as the evening star.

HIPPOCRATES, a physician of the isle of Cos, whose existing writings prove him to have made wonderful advances, for his time, in the art of medicine, and whose name is yet often alluded to.

HIPPOCRENE, a fountain on Mount Helicon, the waters of which are said to have given inspiration to poets, because the hill was sacred to the Muses.

HOMER, the greatest of the poets of Greece, born, according to the most probable accounts, in the isle of Chios. His name signifies "The Blind," and he is said not only to have suffered under this calamity, but to have been a mendicant, or at least a wanderer dependent on his minstrelsy for daily bread. The combination of all the highest poetical qualities in the writings of Homer, from terrible sublimity to the tenderest pathos, has been a fruitful source of astonishment to succeeding times, the rudeness of the age in which he lived being considered. He certainly stands second, as a poet, but to one man who ever lived—William Shakspeare. The Iliad and the Odyssey are Homer's great works.

HORACE, a Roman poet, whose lyrics and satires abound in moral maxims that are often and deservedly quoted.

HYBLA, a mount of Sicily, famous for its fragrant thyme and its honey.

HYDRA, a many-headed monster killed by Hercules, to which an unruly rabble is often compared.

HYGEIA, the goddess of health, daughter of Æsculapius.

HYMEN (or *Hymenæus*), the god of marriage, whose favour was solemnly invoked with song and sacrifice by all entering on the wedded state.

HYMETTUS, a mountain of Attica, celebrated for its bees.

DAEDALUS, son of Eupalus, who, in flying from Crete with his son, soared so near the sun as to melt the joints of the wings made by his father, and fell into the sea.

IDA, a mountain near Troy, where Paris assigned to Venus the prize of beauty over Juno and Minerva.

ILISSUS, a river, and river-god of Attica, remarkable as the subject of a noble extant piece of Greek statuary.

ILIUM, a name for Troy, whence the term *Iliad*.

IO, a beautiful woman whom Jupiter fell in love with, and whom he changed into a heifer, to preserve her from the jealousy of Juno. The suspicious Juno begged the heifer and set Argus of the hundred eyes to watch it; but Mercury, to oblige the superior deity, killed the keeper and set free the metamorphosed lady.

IPHIGENIA, daughter of Agamemnon. That chief, while at Aulis, on his way to Troy, was detained by contrary winds, and was told that only by the sacrifice of his daughter to Diana could the Greek fleet proceed in their course. He reluctantly consented; but when Iphigenia was brought to the altar, she suddenly disappeared, and a goat was seen in her place. Diana carried her off, says the story, to be a priestess at Taurica.

IRIS, the messenger of the queen of heaven, and the goddess of the rainbow, the appearance of which was held to indicate a mission of Iris to earth.

ISIS, a celebrated female deity of the Egyptians, wedded to her brother Osiris.

ISTHMIA, solemn triennial games of the Greeks, which derived their name from being celebrated on the Isthmus of Corinth. Combats, races, and athletic sports of every kind were among the exhibitions, and the poets also contended there for the prize of the baya.

ITHACA, a small islet, now called Thiaki, in the Ionian sea, famous as the kingdom of Ulysses.

IXION, a king of Thessaly, who rendered himself so odious on earth by the murder of his father-in-law, that Jupiter, in misplaced compassion, took him up to heaven. There, however, Ixion behaved so insolently, that Jupiter struck him down to the infernal regions, and ordered him to be tied with serpents to a wheel, which, revolving for ever, rendered his punishment eternal. This story is a frequent theme of allusion.

JANUS, one of the primitive kings of Italy, placed after his decease, on account of his equity, among the gods. He was the guardian of gates, and was represented with two heads, probably to indicate the watchfulness required in such custodians. Any one remarkable for duplicity or two-facedness is familiarly called a Janus. January was named from this deified personage.

JASON, the leader of the Argonauts, with whom he went to Colchis on the Euxine Sea to regain the golden fleece. The king of Colchis promised its restoration if Jason could tame certain flame-breathing bulls, slay a dragon, and perform other difficult feats. Aided by Medea, the king's daughter, an adept in all the arts of enchantment, the chief of the Argonauts accomplished these tasks, and won the fleece; after which he departed secretly, carrying Medea with him as his wife, according to his solemn engagement. Returning home, he found his father Æson too infirm to partake of his triumph, but the art of Medea restored the old man to youth. Jason subsequently became unfaithful to Medea, and, roused to madness, she slew her own children before their father's face. The renewal of Æson's youth, and the filicidal fury of Medea, are often referred to by the poets.

JUGURTHA, an illegitimate nephew of Micipsa, king of Numidia, who slew his cousins, and seized their throne. The historian Sallust has made his name proverbial for cunning, daring, and cruelty.

JULIAN, an emperor of Rome in the fourth century A. D., usually named *The Apostate*, from his having deserted Christianity for Paganism, after being trained up to the former faith. He was, notwithstanding, a man of many virtues, and also of superior talents, as his acts, as well as some of his extant writings, sufficiently indicate. His last moments, when mortally wounded in Persia, were spent in calm converse on the immortality of the soul.

JUNO, sister and wife of Jupiter, and queen of the mythological heaven of Greece and Rome. Her beauty was of a grand and stately kind, and not feminine enough to fix the affections of her husband, whom she annoyed with her jealousies. Her most famous acts consist of persecutions of his mortal mistresses. She was almost universally worshipped, and had splendid temples at Argos, Olympia, Samos, Carthage, and Rome. Her favour was peculiarly implored by women, on account of her being the patroness of marriage and childbirth; and she was also the assigner of power and riches. Juno was usually represented sitting in a chariot drawn by peacocks, and wearing a long veil. She had many names.

JUPITER, son of Saturn and Ops, king of heaven, and ruler of all the gods. Saturn habitually devoured his own children, but Ops deceived him at the birth of Jupiter with a stone, and the child was saved. On reaching the age of one year, he warred with the giant-gods called Titans, and after conquering them, and besides dethroning his father, became the supreme deity and sole wielder of the dreadful thunder. It would be fruitless to go over the actions ascribed to Jupiter, which consist chiefly of low and often ridiculous amours. He was usually represented as a being of majestic countenance, seated on a throne, with a messenger-eagle at his feet, and a thunderbolt and sceptre in his hands. His chief temples were at Dodona in Greece, and Ammon in Libya, and he had numerous names, corresponding to the site of these or to some of his actions; as *Jupiter Capitolinus* (the Capitoline Jove), and *Jupiter Tonans* (Jupiter the Thunderer).

JUVENAL, an able and unsparing satirist of Rome in the early times of the empire.

KALENDS, the name given by the Romans to the first day of every month. As the Greeks had no kalends, it became common in Rome for people to say that any thing would take place "at the Greek kalends," when they meant that it would not take place at all.

LABYRINTH, any place with so many windings as to render escape from it difficult. The most famous of the several labyrinths mentioned by old writers was the Cretan one, built to confine a monster called the *Minotaur*.

LACHESIS, one of the Fates, who spun the thread of life.

LACONIA, a Peloponnesian district, of which Lacedæmon was the capital. The people of the region spoke little, and hence the application of the epithet *Laconic* to concise talking or writing.

LAIS, a Corinthian courtesan of such beauty and notoriety that her name has become a synonym for others in her position.

LAOCOON, a Trojan prince, priest of Apollo, who having offended Neptune, was strangled with several of his sons, by two enormous serpents which issued from the sea. This fable has been rendered immortal by an ancient sculptor, whose work on the subject is yet preserved.

LAPITHÆ, a family or tribe descended from Apollo, famous for having gained, with the aid of Hercules, a dreadful battle against the Centaurs.

LARES, minor deities, supposed by the Romans to

preside over households, and represented by small images, which the possessor always took with him on a change of residence.

Latinus, king of the Italian aborigines, who gave his name to the Roman language.

Latona, mother of Apollo and Diana by Jupiter, and worshipped in many temples.

Leander, a youth of Abydos, who, being in love with Hero, of Sestos, was wont nightly to swim across the Hellespont to meet her, but was at last drowned in a storm.

Leda, wife of Tyndarus of Sparta, visited by the enamoured Jupiter in the form of a swan, and mother of Helen, Clytemnestra, Castor and Pollux.

Leonidas, a renowned Spartan, who, when the Persians invaded Greece with several millions of men, took post at the Pass of Thermopylæ with no more than 300 men, and, self-devoted to death, defended it for three days, until he and all his companions perished, after making fearful havoc among the enemy.

Lethe, an infernal river, whose waters made those who drank it forgetful of all the past. Lethe is a poetical synonym for oblivion.

Livy, one of the most illustrious of the Roman historians.

Lucretia, a young and noble Roman matron, who fell a victim to the licentious passion of the son of Tarquin, king of Rome. After her dishonour, she summoned to her presence her husband and relatives, and disclosing her injuries to them, took away with her own hands the life which she could no longer endure. Junius Brutus took up the bleeding knife which she had used, and swore upon it to avenge her death, an oath amply fulfilled. The name of Lucretia is a by-word for female chastity.

Lucretius, a Roman poet, whose work on the Nature of Things (*Natura Rerum*) forms one of the best expositions of the heathen philosophy.

Lucullus, a Roman noble, not less famous for his talents and virtues than for his extravagant and luxurious mode of living.

Lyceum, a name originally given to the place where Aristotle taught, and since applied to establishments in some respects similar.

Lycurgus, a celebrated lawgiver of Sparta, whose maxims all tended to make men live simply and plainly.

Meander, a river of Asia Minor, so notable for its windings as to have originated the word *meander*, bearing that meaning.

Maeonides, a name applied to Homer, and from him, in the plural, to the Muses.

Maia, mother of mercury by Jupiter.

Manes, a term applied by the ancients to the souls of the dead.

Marathon, a plain of Attica, where Miltiades the Athenian, with comparatively a mere handful of men, routed the vast army of the Persians.

Marius, a Roman of celebrity, who, from ... rank of a peasant, raised himself by his talents to the highest offices of the state. Reduced at one time to the greatest danger and distress, he fled to Africa, and, himself then a ruin, he sat down on the ruins of Carthage. The striking nature of this position has caused frequent allusions to be made to it. Again obtaining power, Marius glutted his vengeance by the most inhuman massacres, and died amid the blood he had spilt.

Mars, the god of war, son of Jupiter and Juno. He was represented as an armed figure in a chariot, driven by Bellona, and drawn by two horses, which the poets named Terror and Flight.

Mausolus, king of Caria, so dearly beloved by his wife, that at his death she drank up his ashes, and erected to him a monument so splendid as to be deemed one of the seven wonders of the world. Hence the word *mausoleum*.

Maecenas, prime minister to Augustus Cæsar, and so highly famed for his countenance of Virgil, Horace, and other men of letters, that a literary patron has since been commonly named a Mæcenas.

Medea, princess of Colchis, and wife of Jason, celebrated for her magical arts, her restoration of the youth of Æson, and her murder, when infuriated by jealousy, of the children born by her to her husband. Few names occur so often in ancient and even modern poetry.

Medusa, one of the Gorgons, whose frightful snake-encircled head turned the beholders to stone. She was slain by Perseus, who placed her head on Minerva's shield, thence rendered unendurable by mortal eyes. The head of Medusa is synonymous with any terrible object which causes stupefaction in him who sees it.

Meleager, an ancient hero, celebrated for slaying the monstrous Calydonian boar.

Melpomene, the Muse who presided over tragedy.

Memnon, an aboriginal Ethiopean or Egyptian king, to whose memory the people of Thebes raised a colossal statue of black marble, which had the wonderful power of emitting musical sounds when struck by the rays of the rising and setting sun. Most writers ascribe this phenomenon, which is often adverted to, to the jugglery of the priests; but some modern travellers, who have visited the yet extant ruins of the statue, have fancied that it emits sounds even at this day.

Menelaus, king of Sparta, the abduction of whose wife Helen by Paris caused the Trojan war.

Mentor, a name which Minerva assumed when she became the guide of Telemachus in his wanderings. Hence arises a familiar title for a counsellor.

Mercury, otherwise called Hermes, son of Jupiter and Maia, and herald of the gods. He presided over oratory, commerce, and thieving, and conducted the spirits of men to the infernal regions. He was represented as a youth with winged cap and sandals, and a magical rod of office, called his caduceus, in his hand. Like his brother deities, he had numerous amours with mortals; and in mere infancy he displayed the strongest qualifications for becoming the patron of robbers, by filching from the other gods all that each deemed most valuable.

Messalina, wife of the emperor Claudius, a woman whose name has become a by-word for incontinence and cruelty.

Midas, a Phrygian king, who, having done a favour to Bacchus, was requested by the god to ask what reward he chose, and, out of foolish avarice, requested that all he touched might become gold. As his very food was converted into that metal, he soon besought the withdrawal of the gift, and was freed from it by bathing in the river Pactolus, the sands of which were turned to gold. For subsequently preferring the music of Pan to that of Apollo, the latter gave Midas the ears of an ass. The story of Midas, and the golden sands of Pactolus, are frequent themes of poetical reference.

Milo, an athlete of old, famous for his great strength. He could carry a large ox, kill it with a blow of his fist, and finally eat it up in one day.

Miltiades, the illustrious Athenian who commanded at Marathon, and afterwards died in prison, a sad monument of human ingratitude.

Minerva, goddess of wisdom, war, and the arts and sciences, who sprung completely armed from Jupiter's brain, according to the fable, without a mother. She is described as one of the most chaste and respectable of all the deities; and though swayed at times by passions far from divine, was a great benefactress of mankind, who owed to her most of the liberal arts. She was usually pictured as a helmeted female of majestic aspect

with a shield in her hand, or ægis, furnished with the head of Medusa. The owl was sacred to her, and she had many magnificent temples erected for her worship. The name of Pallas was as often given to her as Minerva; and, from being the patron deity of Athens, she was also called Athena.

Minos, a famous king and lawgiver of Crete, who, for his equity, was appointed one of the judges of the spirits of men after his decease. A monster called the Minotaur was shut up in the labyrinth of Dædalus; and Minos, severe though just, gave it the captive youth of Athens to devour, till Theseus slew it.

Mithridates, a name borne by several kings of Pontus, one of whom, a man of super-eminent talents, had such a knowledge of pharmaceutical herbs that he could counteract the effect of the most deadly poisons, and hence the use of the word *mithridate* as a synonym for an antidote to such drugs.

Mnemosyne, the goddess of Memory, and mother of the nine Muses by Jupiter.

Momus, the god of fun and pleasantry, jester-general and satirist of the mythological heaven. His name is yet frequently alluded to in connection with these qualities.

Morpheus, son and minister of Somnus, the god of Sleep. He visited mortals in dreams.

Muses, the nine Muses, daughters of Jupiter and Mnemosyne. Their names were Clio, Euterpe, Thalia, Melpomene, Terpsichore, Erato, Polyhymnia, Calliope, and Urania, each of whom (as indicated under their names) presided over a department of poetry or the arts. Apollo was their patron, and the conductor of their orchestra. From certain spots consecrated to them, the poets call them the Pierian, Castalian, and Aonian maids.

Myrmidons, an attached band of Thessalians who accompanied Achilles to the war of Troy. Eager followers of any description are familiarly called by this title, as "the *myrmidons* of the law."

Naiads, certain minor goddesses who presided over springs, fountains, and rivers.

Narcissus, a beautiful youth, who pined away and finally killed himself through love for his own image, as reflected in a fountain. He was said to have been changed into the flower which bears his name. Self-admiring fops often receive this appellation.

Nemesis, the goddess of vengeance, implacable to the bad, but kind to the virtuous.

Neptune, god of the sea, which element was assigned to him when Jupiter and Pluto, the two other chief deities, assumed the sway of the other portions of the universe. Neptune was represented in a chariot of sea-shell, drawn by horses with wings, and in his hand he held a trident, the emblem of his authority. He was almost universally worshipped in the classical times. Of his numerous descendants it is unnecessary to speak.

Nereus, a minor deity of the sea, represented as an old man with a long beard, attended by fifty sportive maids, his daughters, who were called Nereids, and were worshipped by the ancients.

Nero, a Roman emperor, proverbially infamous for his crimes and vices. Originally a youth of promise, Nero was quickly changed in character by the unbounded rule, too much for a mortal to possess, which was then attached to the imperial throne. He assassinated his own mother, and, for the mere luxury of the sight, set fire to the city of Rome. His employment during the fatal conflagration is shown by the sentence "Nero fiddled while Rome was burning." He died by his own hands, to escape the fury of his outraged countrymen.

Nestor, king of Pylos, who at a very advanced age went to the Trojan war; and is so highly lauded by Homer for his eloquence, that posterity have adopted his name as a synonym for a wise and venerable old man.

Numa, a sovereign of Rome, proverbial for legislative skill, which he affected to owe to the counsels of a supernatural and secret visitant named Egeria.

Nymphs, a general term applied to all the minor goddesses of the land and sea, such as the Dryads, Naiads, and Nereids. The nymphs were held not to be immortal, but to live for several thousand years.

Oceanides, sea-nymphs, daughters of Oceanus, and numbering several thousands. Their father Oceanus, like Cœlus the Heaven and Terra the Earth, was one of the primitive divinities, and was totally different from Neptune, being the creation of a much older mythology.

Œdipus, king of Thebes, son of Laius and Jocasta. Being exposed in youth, he had the misfortune to kill his father and marry his mother ere he discovered his parentage. These events made his story a sorrowful theme for the poets; but his name is now chiefly familiar in the sense of an expounder of riddles, because he solved the enigma proposed by a talking monster called the Sphinx, and put an end to its ravages.

Olympia, a town of Elis in the Peloponnesus, where the famous Olympic games were celebrated. These were of great antiquity, and comprised not only athletic exercises of every kind, chariot-racing, and the like, but also contentions in poetry, eloquence, and the fine arts. The celebration took place at the end of every four complete years, and hence it became the fixed practice to measure time by these intervals, called Olympiads. People attended them from all parts of Greece; and the most powerful monarchs, from Alexander the Great to Nero, were proud to win prizes at Olympia, while men of letters valued the honour not less highly.

Olympus, a mountain of Thessaly, which, from its altitude, the ancients conceived to reach the heavens, and which they made the home of the gods.

Orcus, a name of Pluto, frequently used to signify the nether regions.

Oreads, the goddess-nymphs of the mountains.

Orestes, the son of Agamemnon and Clytemnestra, and the avenger on the latter of his sire's murder. Pursued in consequence by the Furies, Orestes could find peace nowhere, though tenderly consoled and supported by Pylades, whose name and his own have become proverbial for bosom friendship. Orestes was at length purified from stain by bringing the Taurican statue of Diana to Greece.

Orion, a gigantic personage, who, after various adventures on earth, had the honour of being elevated to a place among the constellations.

Orpheus, the most famous of the early poets and musicians of Greece, who, by his art, could not only "charm the savage breast," but cause mountains to dance and streams to pause in their course. On the death of his wife Eurydice, he went to seek her, and so enchanted Pluto with his strains, that the god gave back his spouse to him, only stipulating that he should not look upon her till the earth was reached. But Orpheus turned to gaze, and Eurydice was lost. A poem on the Argonauts and some other extant pieces, are assigned to Orpheus, but on imperfect grounds.

Osiris, a great Egyptian deity.

Ossa, a lofty mount of Thessaly, said to have been moved by the giant Titans, when they sought to scale the heavens. Hence the well-known allusion to the piling of Pelion, another hill, on Ossa.

Ovid, a poet of Rome, noted for the ease and elegance of his verse, but stained by immoralities of thought and diction.

Pactolus, a river of Lydia, the sands of which were said to be converted into gold when Midas dipt his hands in them. A Pactolus is a term for a mine of wealth.

Pæan, a hymn sung in honour of the Pythian Apollo.

Palinurus, a pilot who has given a name to his craft, from his skill in guiding the bark of Æneas.

Palladium, a famous colossal statue of Pallas-Minerva, on which the city of Troy, in which it stood, depended for preservation. It was stolen by the Greeks. The importance of the statue to Troy has originated such phrases as the "Palladium of our liberties," applied to important privileges, statutes, and the like.

Pallas, a name of Minerva.

Pan, the god of shepherds, huntsmen, and rustics generally, and son of Mercury. He was painted like the satyrs, having horns and the limbs of a goat. He invented the flute with seven reeds. Pan was worshipped very extensively, but particularly in Arcadia, where he had an oracular temple on mount Lycæus. The poets abound in allusions to this deity.

Panacea, the skilful daughter of the medicine-god Æsculapius, from whose name originated a word signifying a universal cure.

Pandora, the first woman, according to some ancient writers. Jupiter, wishing to punish the Titan Prometheus, caused Pandora to be made of clay, and each of the deities bestowed some personal gift on her. She was then sent with a closed box to Prometheus, but he suspected some artifice, and sent her away. His brother was less cautious, and wedded Pandora, from whose box, when opened, there issued all the ills that have since afflicted mankind. As a cure for these ills, Hope only remained upon earth. This fable is often quoted and applied.

Pantheon, a temple of Rome, dedicated, as its name implies, to all the gods.

Paphos (now Hafo), a city of Cyprus, from which Venus, to whom that isle was sacred, frequently receives the name of the Paphian goddess.

Parcæ, the powerful goddesses called the Fates, who were named Clotho, Lachesis, and Atropos. One held a distaff, another spun from it the thread of human life, and the third divided it with shears, when the decreed term had arrived. The decrees of the Fates were unchangeable even by the greatest of the gods, and they were worshipped with more true devoutness, perhaps, than any other supposed divinities.

Paris, son of Priam of Troy, exposed in infancy, because his mother Hecuba dreamt that she had brought forth a fatal torch. Educated as a shepherd on Mount Ida, Paris was chosen to decide on the comparative beauty of Juno, Minerva, and Venus, when these deities were rivals for a golden apple, inscribed by the goddess Discord with the words, "To be given to the fairest." Paris decided for Venus, who so favoured him in consequence, that he persuaded Helen, the most beautiful woman of the age, to fly with him to Troy. But all the Greek princes joined in resenting the injury, and Paris proved, indeed, the firebrand by which Troy was ruined. The judgment of Paris and the apple of Discord are the subjects of many classical allusions.

Parnassus, a very lofty mountain of Greece, to which, as the supposed favourite seat of Apollo, and the Muses, poets have looked in all times for inspiration.

Parthenon, a splendid temple of Minerva at Athens, adorned by the works of the sculptor Phidias.

Patroclus, the bosom friend of Achilles, slain by Hector before the walls of Troy.

Pegasus, a winged horse given by Minerva to Bellerophon when he went to combat the monster termed the Chimæra. Requiring a lofty flight, the poets frequently choose to imagine their motions aided by Pegasus.

Pelion, a Thessalian mount, on which Ossa was piled when the Titans sought to scale heaven.

Peloponnesus, the ancient name for the Morea.

Penates, a class of inferior gods who presided over the inmost recesses of households.

Penelope, wife of Ulysses, king of Ithaca, famous for her fidelity to her husband during his long absence despite the assaults of numerous importunate suitors. To deceive these, she said that she would wed when a certain piece of tapestry was finished by her, but the work done by day the chaste matron undid by night. Hence the phrase Penelope's Web, applied to cases where progress is similarly retarded.

Penthesilea, a queen of the Amazons, proverbial for her boldness in war, and slain by Achilles before Troy.

Pericles, a renowned warrior, statesman, and orator of Athens.

Peripatetic Sect.—The pupils of Aristotle, so named (from the Greek) because instructed by him while walking.

Perseus, son of Danaë by Jupiter; exposed in infancy with his mother in a small bark, but preserved to fulfil the decrees of Fate by accidentally killing his grandsire. Perseus became a renowned hero, slaying the Gorgon Medusa, among other feats, by the aid of Pluto's invisible helmet and Minerva's shield. He also relieved Andromeda, an Ethiopian princess, from a sea-monster to which she was exposed in chains. After his death, Perseus received the honours of a demigod, and poets and painters have dwelt much on the supposed incidents of his career.

Petronius (Arbiter), a favourite of Nero, often named in connection with gayeties and revels, from his being the caterer for amusement (*arbiter elegantiarum*) to that prince.

Phaeton, son of the sun-god Phœbus-Apollo, by the nymph Clymene. Taunted as of unknown birth by his youthful companions, Phaëton is said to have visited the palace of the sun, and to have received from his sire a solemn promise that whatever he asked should be granted. The vain youth asked to drive the chariot of the sun for one day, and, bound by oath, Phœbus was reluctantly forced to comply. The issue was, that the fiery steeds became unmanageable; and to prevent a universal conflagration, Jupiter struck Phaëton to earth with a thunderbolt. His death was so deeply mourned by his sisters, that in pity they were changed to poplars. Phaëton is a by-word for rash ambition.

Phalaris, a cruel Sicilian tyrant, who caused a brazen bull to be made for the purposes of torture, and consigned to it the inventor Perillus as the first victim. Letters ascribed to Phalaris, but shown by the critic Bentley to be spurious, are in existence.

Pharos, an islet in the bay of Alexandria, containing a splendid light-house, deemed one of the seven wonders of the world.

Pharsalia, a place in Greece, where the republican liberties of Rome received the final blow from the hands of Julius Cæsar, his great opponent Pompey being there conquered by him.

Phidias, the most illustrious of Greek sculptors.

Philippi, a town of Macedon, where Brutus and Cassius were routed by Augustus Cæsar and Mark Antony.

Philip, a famous Macedonian monarch, father of Alexander the Great. By his great valour and consummate address, Philip enlarged his dominions, and gained a fatal ascendency over the free republics of Greece. Trained in youth in the schools of Thebes, he polished and disciplined his rude subjects, and raised them from a secondary to a primary position among their neighbours. Philip was an ambitious and unprincipled man, though capable of generous and even noble actions. His barbarian-like indulgences in drinking has been made memorable by the words of a claimant for justice at his hands "I appeal from Philip drunk to Philip sober" was the

reproof, and he bore it calmly. From the denunciations of him by Demosthenes, such oratorical invectives have been called Philippics.

Philomela, sister of Progne, who was wife to Tereus, king of Thrace. While bringing Philomela to see her sister, Tereus offered violence to her, and after cutting out her tongue to prevent discovery, confined her in a lonely castle. He then told Progne that her sister had died by the way, but the former detected the falsehood by means of a piece of tapestry wrought by Philomela. The infuriated wife of Tereus slew and served up to him his own son in a dish, on discovering which he would have slain her, but was on the spot changed into a hoopoe, while the son's remains became a pheasant, Progne a swallow, and Philomela a nightingale. The nightingale yet bears his name, and is supposed by the poets to wail her sad fate in the sounds "Teru ! Teru !"

Phœbe, a name given to Diana in the character of the moon.

Pieria, a spot in Thessaly, which gave the epithet Pierian to the Muses.

Pindar, a poet of Thebes in Bœotia, justly regarded as the prince of lyric poetry. His odes are without parallel for sublimity and fire. The poets say that the settlement of a swarm of bees on his lips foretold his future greatness.

Pirithous, an ancient hero, between whom and Theseus so strong a friendship existed, that the pair are quoted as models of that sentiment.

Pittacus, one of the seven wise men of Greece.

Plato, a philosopher of Athenian descent, whose name stands at the head of his class among the Greeks. He was a disciple of Socrates and founded the school of Academics. Plato laboured to construct a great system of metaphysics, morals, and policy, and displayed his own genius in eliciting many profound isolated truths; but, as a whole, his system is but a maze of ingenious conjecture. The phrase Platonic Love, indicating an affection seated merely in the mind, is derived from some principles evolved in his account of an imaginary and perfect republic.

Pleiades, the seven daughters of Atlas, placed at their death among the constellations.

Pliny.—Two members of the Pliny family, uncle and nephew, have left brilliant names in Roman literature. The elder Pliny wrote many works, but his "Natural History," a production alike full of truths and absurdities, has alone been preserved; and of the younger Pliny the Letters are still extant. The uncle perished in an eruption of Vesuvius, A. D. 79.

Plutarch, a Greek historical biographer, whose valuable works have given a name to many compositions of the same class.

Pluto, one of the sons of Saturn, and king of the infernal regions. He married Proserpine, the daughter of Ceres, having borne her off from Sicily while gathering flowers, "herself a fairer flower." Black bulls were most frequently sacrificed to Pluto, who is represented as a grim figure, with a two-pronged trident in his hand, and keys to indicate his close wardship of the dead. He sat on a throne of sulphur, and around him were his gloomy courtiers, the Fates, the Furies, and other infernal powers. Dis, Ades, Orcus are names sometimes given to Pluto.

Plutus, the god of riches among the ancients, painted as blind.

Pollux, son of Leda, and brother to Castor, raised to a place among the stars.

Polyhymnia, the muse of singing and rhetoric.

Polyphemus, a gigantic Cyclop, whose one eye Ulysses burnt out with a firebrand, on being captured by the monster. The story is told in the Odyssey.

Pomona, a Roman deity, who had charge of gardens and fruit-trees. She had vowed to live single, and changing herself into an old woman, as the pretty fable runs, Vertumnus, the god of spring, induced her to change her purpose.

Pompey.—The family of Pompey was a famous one at Rome, but chiefly rendered eminent by one member, called Pompey the Great. The conquests of this Roman were of vast extent, and his triumphs numerous, while his character is described as noble in the extreme. But though Pompey married the daughter of Julius Cæsar to cement their friendship, two men of such aspiring minds could not co-exist in peace in Rome. They turned their arms against one another, and at Pharsalia Cæsar proved the conqueror. Pompey fled to Egypt, and was there basely and ungratefully murdered.

Praxiteles, a native of Cnidus, famous for his skill in statuary.

Priam, king of Troy, an aged man when the Greek princes besieged and took his city.

Priapus, a son of Bacchus and Venus, whose statues, set up in gardens, were of a very offensive nature.

Priscianus, a grammarian of the Greek empire, whose name is often quoted in reference to correctness of language.

Procne (or Progne), wife of Tereus, changed to a swallow.

Procrustes, a robber chief of Attica, who was wont to bind travellers down to a bed, and to cut off a portion of their bodies, or to rack these out, if they chanced in either way not to fit the couch. He was killed by Theseus. The bed of Procrustes is a familiar allusion.

Prometheus, one of the Titanic race, famed for his knowledge and address, and capable of deceiving Jupiter himself. To punish a fraud exercised upon him, that god took away fire from mankind, but Prometheus climb the heavens and regained the element by theft. Jupiter, still more provoked, sent down Pandora with a box of ills, but Prometheus was too cautious to accept the gift. The supreme deity, however, chastised him by chaining him to Mount Caucasus, and sent a vulture to feed perpetually on his liver, which still remained undiminished. Hercules at length set the sufferer free. The stealing of the fire is supposed to refer to the discovery of its use; and Prometheus, whose story is often referred to, is called the inventor of many useful arts.

Propertius, one of the secondary Roman poets, author of many beautiful though not perfectly moral compositions.

Proserpine, the daughter of Ceres and wife of Pluto, permitted to spend half the year in heaven at her mother's entreaties. The changes of the moon are supposed to be indicated here. Proserpine was universally worshipped, sometimes under the name of Libitina, Hecate, and Libera.

Proteus, a sea deity, who possessed the gift of prophecy, but was difficult of access, and, unless properly chained, had the power of assuming different shapes to elude his interrogators. Proteus affords a favourite similitude to express a change of form or purpose.

Psyche, a beauteous nymph, whom Cupid married and long lived with in a state of bliss. Venus put her to death, but Jupiter in pity made her afterwards immortal. As Psyche means the soul, this story is thought to present a personification of it: and to indicate the light ethereality of the soul, Psyche is painted with the wings of a butterfly.

Ptolemy.—The Ptolemies were a race of sovereigns, descended from a general of Alexander the Great who obtained the throne of Egypt.

Punica Fides.—The Romans in their enmity called the Carthaginian or Punic people extremely treacherous, and hence sprung the phrase *Punica fides* (Punic faith), to express utter faithlessness.

Pygmalion, a sculptor of Cyprus, who having made

a beautiful ivory statue of a female, fell in love with his own work, and by his prayers moved Venus to animate it. This fable is the theme of frequent allusion.

PYLADES, a prince of Phocis, bound so closely in the bands of friendship with Orestes, that they are cited as exemplars of that feeling in its strongest form.

PYRAMUS, a youth of Babylon attached to Thisbe, whom, from the hostility of their parents, he could only converse with through a chink in the wall between their habitations. The lovers, however, appointed to meet at the tomb of Ninus. Thisbe arriving first, was frightened away by a lioness, which, with bloody jaws, tore a scarf dropped in her flight. Pyramus saw this article, and believing Thisbe dead, slew himself. The distracted maiden, on her return, followed him to the tomb.

PYRRHA, wife of Deucalion, and saved with him from the great Thessalian deluge. By throwing stones behind her she is said to have repeopled the earth with women, as Deucalion supplied it with men.

PYTHAGORAS, a celebrated philosopher of Samos, who, amid many useful doctrines, taught the curious one of the transmigration of souls, and even said that he remembered what bodies he had occupied before. He made his pupils keep silence for many years. The greatness of his real talents is shown by his assertion that the planets moved round the sun as a centre, an idea laughed at in his own time, but since established as a certainty.

PYTHIA (Pythoness), the priestess of Apollo at Delphi, who, inspired by vapours from the earth, delivered, amid convulsive writhings, the oracles of the deity.

PYTHON, a serpent killed by Apollo, from which his priestess received her name, as he himself was called the Pythian god.

REGULUS, a Roman consul, who, in warring with Carthage, was taken prisoner, and afterwards sent home to negotiate a peace. Aware of the reduced state of their enemy, Regulus advised the Romans not to agree to a cessation of hostilities. The noble prisoner thus sealed his own doom, as he was bound, if peace was not obtained, to return to Carthage. He did so, and underwent, after cruel tortures, the horrible death of being shut up in a barrel pierced on all sides with sharp spikes. His devotion to his country and his promise have gained him an undying name.

RHADAMANTHUS, brother of Minos, and so famous for his equity on earth, as to have been appointed one of the judges of the dead.

ROMULUS.—Romulus and Remus, the two brothers who founded Rome, were fabled by their proud descendants to be the sons of Mars by a princess of Italy. They were exposed in infancy, but were saved and suckled by a she-wolf. The twins, on reaching manhood, resolved to found a city; but, for a trifling offence, Remus was slain by his brother. Romulus, however, with a band of fugitives and criminals, founded Rome; and as the neighbouring tribes despised his followers, he carried off mates for them from among the women of the Sabine nation. This abduction was often adverted to by the descendants of its authors. Romulus reigned thirty-nine years, and was then carried up to heaven, according to a story invented, most probably, to conceal his assassination. He received divine honours after his death.

ROSCIUS, a Roman actor of such celebrity, that every distinguished follower of that profession has received his name.

RUBICON, now Rugone, a small stream of Italy, which, after long hesitation, Julius Cæsar crossed, thus throwing off allegiance to the Roman senate, and affording a lasting simile for the taking of any decisive and hazardous step.

SABINI.—The Sabines were a primitive Italian people, from among whom Romulus carried off wives for his followers on founding Rome.

SALLUST, a Roman historian, whose works, though not lengthened, are justly valued for their style and accuracy.

SAPPHO, a famous poetess of Lesbos, whose scanty fragments indicate extraordinary powers, and who was so tortured by love as to throw herself into the sea.

SARDANAPALUS, the last of the Assyrian monarchs, noted for his luxury and effeminacy. His officers having conspired against him, and besieged him in Nineveh, he set fire to his palace, and was consumed in the flames, with all his slaves, concubines, and treasures.

SATURNALIA, festivals held in honour of Saturn, and intended to commemorate the freedom and equality which prevailed in the golden age, when Saturn was king. From the privileges enjoyed during these holidays by the poor man and the slave, any revels where a free and levelling spirit is displayed have been called Saturnalia.

SATURN, son of the heaven and earth, and supreme ruler of the earth till he was dethroned by his son Jupiter. Saturn afterwards fled to Italy, and so cultivated there the arts of peace and simple industry, that his reign was called the golden age. Saturn is represented as an aged man with a scythe in his hand and a serpent wound into a circle, to indicate the ceaseless round of time. *Chronos*, or Time, is also one of the names of Saturn.

SATYR.—The Satyrs were minor deities of the country, shaped like goats inferiorly, and having horns on their head and long hair over the body. The idea of them most probably came from the baboon tribe.

SCIPIO, the patronymic of an illustrious family of Rome, one member of whom, surnamed Africanus from the feat, was the conqueror of Hannibal at Zama. He was equally famous for his private virtues as for his military successes; and "the continence of a Scipio," a common phrase, had its origin in the refusal of Africanus to see a beautiful princess who had fallen into his hands, lest the frailty of human nature should tempt him to take any advantage of his power over her fate.

SCYLLA, a rock off Sicily, famous as dangerous to mariners, in combination with the whirlpool Charybdis. The ancients called the rock a monster, into which the nymph Scylla had been changed by Circe.

SEMELE, daughter of Cadmus, and mother of Bacchus by Jupiter, destroyed by her vain wish to behold her lover in all the insupportable blaze of his divinity.

SEMIRAMIS, a queen of Assyria, celebrated for her masculine strength of character, her warlike successes, and the magnificent buildings which she constructed in Babylon.

SERAPIS, a deity of the ancient Egyptians.

SESOSTHIS, an early king, renowned for the extent of his conquests and the mildness of his sway.

SIBYL.—The Sibyls were women inspired by the gods with the spirit of prophecy. The most famous of them was the Cumæan Sibyl, who is said to have resided at Cumæ, in Italy, and to have obtained from Apollo the privilege of living as many years as there were grains in a handful of sand. But she forgot to ask for youth also, and grew old and decrepit. It is stated that the Sibyl sold three of nine volumes of prophesies to the monarch Tarquin, and that these were preserved and consulted by the Romans with great reverence, until they were destroyed by fire. A book of Sibylline verses is extant, but scholars universally deem it spurious and modern. Every gipsy fortune-teller is familarly named a Sibyl.

SILENUS, a son of Pan, and attendant of Bacchus, usually painted as a jolly intoxicated old man riding on an ass, and crowned with flowers.

SINON, a Greek, whose frauds before Troy have made his name a by-word.

SIRENS.—Three sea-nymphs who lived on a small

is.and near Sicily, and so charmed the passing voyager with their melodious voices that he forgot all else, and died of starvation while listening. Ulysses, in order to hear them safely, had the ears of his crew stuffed, and himself tied to the mast of his ship. He was enchanted with the music, but the crew would not obey his commands to stop, and thus he listened and yet lived. The disappointed Sirens threw themselves into the sea. Fine female singers are now Sirens in common speech.

Sisyphus, a crafty prince of the heroic times of Greece, who, for some uncertain offence to the gods, was doomed, in the infernal regions, to roll a huge stone up a hill, whence it redescended immediately, rendering his punishment perpetual. The fruitless toil of Sisyphus is often the theme of allusion and comparison.

Socrates, the wisest and best character, perhaps, of antiquity. He was born and lived in Athens, where, in an unpretending way, he taught men to love virtue and cultivate knowledge. His opinions and actions, as recorded by his pupils Plato and Xenophon, have filled posterity with admiration for him from whom they came. Socrates was at length accused by the ungrateful Athenians of offences against religion, and died, according to his sentence, by drinking a cup of hemlock presented to him. His last moments, spent among his weeping friends, brought out his character in even a nobler light than it had before appeared in.

Solon, one of the seven wise men of Greece, celebrated for the equity of the laws dictated by him to the Athenians. His fame for wisdom has caused men of similar repute to be called Solons.

Somnus, the god of Sleep, and son of Night.

Sophocles, a tragic poet of Greece, who composed in a grave and lofty style.

Sphinx, a monster with the head and chest of a woman, a dog's body, a serpent's tail, and the wings of a bird, sent by Juno to devastate Bœotia. An oracle told that the Sphinx would destroy herself on one of her enigmas being explained, and Œdipus, on being asked by her what animal walked on four legs at morn, two at noon, and three in the evening, correctly answered "man," referring to infancy, manhood, and old age. The Sphinx then killed herself against a rock.

Stagyra, the birth-place of Aristotle, whence he was called the Stagyrite.

Stentor, a Greek whose voice, according to Homer, equalled those of fifty men combined. "Stentorian" is a settled synonym for excessively loud enunciation.

Stoic.—The Stoics were a sect of philosophers founded by Zeno, who professed so grave and stern a morality that their designation has been applied to men who exhibit great powers of self-restraint and endurance.

Styx, a cold and venomous river of the infernal regions, famous on account of the estimation in which it was held by the gods, who swore by it, and held such oaths inviolable.

Sybaris, a town on the bay of Tarentum in Italy, the inhabitants of which were so effeminate, that "a Sybarite" has become a phrase applied to any person of such a character.

Tacitus, a Roman annalist of the empire, whose writings have been deemed models of excellence in historical literature.

Tantalus, who, for murdering his own son, and serving him up to Jupiter to try his divine insight, was condemned to remain up to the neck in water, which ever fled from his lips as he sought to slake his perpetual thirst. Hence the word "tantalize," now firmly fixed in various modern languages.

Tarpeia, a woman who is said to have given name to the Tarpeian rock on which stood the Capitol, and from which great malefactors were hurled by the Romans.

Tarquin.—From the son of the last Tarquin of Rome,

forcible despoilers of female honour have gained a name appropriate to their actions.

Tartarus, the most familiar name of the infernal regions. Though taken often for the whole, Tartarus properly expressed the last abode of the wicked, as Elysium indicated that of the good.

Telemachus, son of Ulysses, who showed his filial piety by travelling in quest of his father, when the latter wandered from place to place on his way from Troy. Minerva accompanied the young prince under the form of an old man named Mentor, whence a common term for a counsellor and guide.

Tempe, a vale of Thessaly, described by the poets as the most delightful spot on the earth, and used as a by-name for all similar scenes of natural beauty.

Terpsichore, the Muse of dancing.

Thales, one of the seven wise men of Greece, peculiarly famous for his skill in astronomy.

Thalia, the Muse who presided over comic poetry, pastorals, and festival celebrations.

Themis, a goddess whom Homer calls the presiding guardian of justice and civil law, and whom modern lawyers nominally acknowledge as their patroness. She is painted holding a sword and scales.

Themistocles, a famous Athenian commander, who conquered the Persians at the great naval fight of Salamis Several anecdotes of him are often quoted. "Strike, but hear me!" were words used by him to an angry adversary. Napoleon Bonaparte, at his surrender to England, compared himself to Themistocles, who in a similar way had planted himself on "the hearth" of a foreign king and sought refuge.

Theocritus, a native of Syracuse, styled the father of pastoral poetry.

Theseus, an Athenian prince of the heroic ages, renowned for his great deeds. In youth he went to Crete as one of the tributary band to be sacrificed in the Labyrinth to the Minotaur, but he slew the monster, and escaped by the help of the clue of Ariadne. He afterwards deserted Ariadne. The share of Theseus in the battle of the Lapithæ, his friendship for Pirithous, proverbial for its closeness, and a visit to Tartarus, are among the principal other features in his story.

Thespis, an ancient Greek poet, from whom, as the supposed inventor of tragedy, springs the phrase of the Thespian art, applied to the drama.

Thetis, a sea-deity, who, by marriage with the mortal Peleus, became the mother of Achilles.

Thisbe, a maiden of Babylon, beloved by Pyramus.

Thucydides, a historian of Athens, highly esteemed for his fidelity and the merits of his style.

Thule, an island in the northern parts of the German Ocean, termed by the Romans *Ultima Thule*, as the ultimate point of the earth in that direction. Some have thought it Greenland and some Iceland, but the probability is that the name was really applied to the Shetland Isles.

Tiberius (Cæsar), successor of Augustus, and only less proverbial for cruelty than his successors Nero and Domitian.

Tibullus, a poet of Rome, whose graceful and chaste compositions have gained for him a first place among elegiac bards.

Timotheus, a poet and musician who followed the fortunes of Alexander, and is celebrated by Dryden as "raising a mortal to the skies"—that is, flattering his master as a divinity.

Tiresias, a famous Theban, struck blind, as the story runs, by Juno, but gifted with prophecy by Jupiter, and consulted during his life by all Greece.

Tisiphone, one of the three Furies.

Titan.—The gigantic family of the Titans, descended from the Heaven and Earth, warred against Jupiter, and tossed mountains at him in their fury, but were subdued

and condemned to heavy punishments. This is the common fable, though other giants are said by some to have been Jupiter's enemies.

Trajan, a Roman emperor, whose many virtues are chiefly sullied by his cruelty to the primitive Christians of Rome. Trajan's pillar at Rome is a work of great celebrity.

Triptolemus, a native of Eleusis, whom Ceres sought to make immortal by laying him upon flames to purge away the grossness of humanity; but his mother, through curiosity, peeped upon the proceedings, and, terrified at the sight, frustrated the design. In compensation, Ceres taught Triptolemus the art of agriculture, and gave him the honour of its dissemination over the earth.

Triton, a leading sea-god, represented as half man half dolphin, and always seen blowing a horn.

Tusculum, the country-seat of Cicero, from which similar retreats of great men are sometimes called Tusculan villas.

Tyrtæus, a Greek poet, usually held the type of martial verse writers.

Ulysses, king of Ithaca, usually deemed the wisest of the Greeks who went to Troy. After the close of the siege of that city, during which he carried off its Palladium, and performed many feats of address and valour, he underwent many years of adventure, described in the Odyssey, ere he reached his home. There he found his means wasted by suitors to his wife Penelope, but the tried warrior soon slew or dispersed them all, and resumed his throne in peace.

Urania, the Muse who presided over astronomy.

Venus, the goddess of love and beauty, and mother of Cupid. Her parentage is not settled, but she sprung directly, it is said, from the froth of the sea, and was immediately received among the deities. The character given to Venus is one befitting only the goddess of licentious pleasure. Her power to charm is stated to have depended on her *cestus* or zone, and she was usually represented sitting in a chariot drawn by doves. From various favourite spots she is called by the names of the Cytherean, Cyprian, and Paphian goddess, as well as by other names.

Vertumnus, the god of spring among the Romans.

Vesta, usually termed the mother of the deities, and patroness of the virgins called Vestal, who, like modern sisterhoods of nuns, retired from the world to live in sacred establishments. Any departure from chastity was fearfully punished in them, and to seduce a vestal virgin was deemed a horrible crime in men. A fire was kept burning continually in the vestal establishments, its extinction being dreaded as an omen of heavy calamity. The phrases of "vestal virgins" and "vestal flames" are familiarly used in the sense here indicated.

Virginia, daughter of the tribune Virginius. Having arrested the licentious eye of Appius Claudius, then in power, he endeavoured to get possession of her by proving her to be his slave; but her father defeated his nearly successful design by stabbing her with his own hands, to preserve her honour. Many a poet has dwelt on this story.

Vulcan, son of Juno, and god of Fire, supposed to work, with his assistants the Cyclops, in the interior of Mount Ætna. Though lame and deformed, he was the husband of the goddess of beauty, and father of Cupid. He acted as armourer to the gods, and sometimes wrought for men, as in the case of Achilles. The worship of Vulcan was well established.

Xantippe, wife of Socrates, and so great a shrew as to have given a name to all ladies similarly gifted.

Xenophon, an illustrious writer and soldier of Athens, who went to Persia to assist Cyrus to obtain the throne of that country. When Cyrus was defeated, the auxiliary Greeks made that retreat homewards so often adverted to as the Retreat of the Ten Thousand. Xenophon latterly was their leader.

Zoilus, a critic, who made himself so [illegible], his animadversions on Homer and other writers, that a carper of the same craft is yet called by his name.

Zoroaster, a famous Persian sage, who is said to have founded or reformed the religion of the Magi

DICTIONARY OF TERMS IN SCIENCE, LITERATURE, AND ART.

[A COMPREHENSIVE and minute Terminological Dictionary, or vocabulary of all the terms now in use in literature, science, and art, would require a much larger amount of space than can be here afforded. Fortunately, so extensive a view of terminology is not required, as the terms appertaining to many branches of knowledge have already been explained in the present series. For example, in those numbers of the "Information for the People" which treat of Astronomy, Geology, Zoology, the Anatomy of the Human Body, Chemistry, and Mechanics, the principal terms connected with these subjects will be found, with ample accompanying explanations; and the case is the same as regards other matters discussed in the course of these sheets. It is not in general difficult to discover the department, at least, of science to which any word of doubtful meaning belongs, and reference may be satisfactorily had. It is imagined, to the quarters alluded to, for interpretations not given in the present dictionary. As the insertion of radical or primitive words would have occupied much space, without answering any good purpose, it may be here generally observed that men of science have almost universally selected the Greek language as the one best suited by its idiomatic peculiarities for the formation of compound terms. It may be of some little advantage to name here a few of the most common roots so used. Many of the names of sciences are framed from the word *grapho*. Thus, Geography, derived from *grapho*, which signifies to *write*, and *ge*, the *earth*, has the sense of "a writing on or description of the earth." Other scientific terms are formed from *logos*, a *discourse*. Thus, Ornithology means "a discourse on birds," *ornis* being the Greek term for a bird. *Nomos*, a *law*, composes other words; as, for example, Astronomy, which signifies the "law of the stars," *astron* being the word for a star. The word *scopé*, an *observation*, compounds a few terms, as Craniosceopy, which, with *cranion*, means "observation of the skull." Various terms are also formed from *metron*, a *measure;* thus, Geometry signifies a "measuring of the earth," and Thermometer "a measure of heat," *thermé* being the term for heat or warmth. In the science of Geometry, many words are compounded of *gonia*, an *angle*, as in the case of Pentagon, a word signifying "a figure of five (*pentè*) angles;" and some are formed from *hedra*, a *base* or *side*, as Octahedron, "a figure of eight sides." Again, in the science of Botany, a great many words are framed from *andros*, *men*, and *gunè*, a *woman*. For instance, when the former word is compounded with *monos*, *alone* or *single*, it forms Monandria, a word applied to plants with one stamen to each of its flowers. Monogynia, framed similarly with *monos* and *gunè*, signifies a plant with one pistil. The whole of the Greek numerals are joined with these words in the like manner, and indicate in each case the existing number of what are called the sexual parts of plants. The following is the mode of the use of these numerals with *andros*, and they are similarly compounded with other words:—Monandria, 1; Diandria, 2; Triandria, 3; Tetrandria, 4; Pentandria, 5; Hexandria, 6; Heptandria, 7; Octandria, 8; Enneandria, 9; Decandria, 10; Dodecandria, 11 to 17. Where numbers not reckoned in detail are to be indicated, *polus*, signifying *many*, is the compounding term, as in Polyandria, a plant with many stamens.

The same words *monos* and *polus* form many general terms, as Monotonous, in the sense of *single-toned*, and Polytechnic, having the meaning of *many-sciened*. The word *polis*, a *city*, compounds many words, as Metropolis, signifying the *mother-city*. *Hudor*, *water*, and *pur*, *fire*, also form a number of scientific terms: as Hydrophobia, a *dread of water*, and Pyrotechny, the *art of making fireworks*.

These general hints on the compounding of technical terms are all that can be given here. As in the preceding instances, the majority of the epithets used in science are simple in construction; and in the present sheet, the language which renders the original roots most directly into English has been chosen in giving the sense of the words compounded from them. Some are disposed, it may be observed, to find fault with men of science for not making use of modern and vernacular language, but the complaint is made without due consideration. The idiom of the English and most living tongues is opposed altogether to such a system of compounding; and as each country might fairly demand to employ her own language, what a maze of confusion scientific nomenclature would inevitably become, were there not some common form of speech intelligible to all.]

ABEYANCE.—Lands are said, in law, to be in abeyance when they are not actually in the possession, but only in the expectance, of the next inheritor.

ABORIGINES, a name given first to the ancient inhabitants of Latium, and now applied to the original natives of any country.

ACCIDENCE, a display of the variations of words according to their government or sense. The term is often applied to any work that teaches the rudiments of grammar.

ACCOLADE, the ancient ceremony of conferring knighthood, consisting, formerly, in an embrace given to the young knight by the sovereign. The neck is now gently touched with a sword instead.

ACCORDION, a new and small musical instrument, the sounds from which are produced by air acting on vibrating tongues. It is held during use in the hands.

ACIDS, compound chemical bodies which are tart to the taste, change the vegetable blues to red, and form salts with alkalies and earths.

ACOLYTE, a name applied to the young official attendants of the Catholic bishops.

ACOUSTICS, that branch of science which treats of the nature and modification of sound. (See article ACOUSTICS, in the present series.)

ACROSTIC, a poem, the first letters of which compose, collectively, some name, title, or word chosen for the purpose.

ADIPOCERE, a fatty or waxen substance, into which, under certain circumstances, decomposed animal bodies resolve themselves.

ADVOWSON, the right of presentation to a church or benefice.

AEROLITES, meteoric stones which fall from the atmosphere, and have been found at different times in considerable numbers, some of them weighing but a few grains, and others upwards of a hundred pounds.

AERONAUTICS.—The art of aëronautics or aërostation consists in the navigation of the air by means of balloons filled with a gas of greater rarety than the atmosphere. Heated or rarefied air was first used for the purpose, but now hydrogen gas is universally employed.

AGRICULTURE, the art of cultivating the earth. (See article AGRICULTURE.)

ALBINOS, a class of human beings remarkable for the red colour of their eyes, their white hair, and pale skin, peculiarities caused by a defective physical constitution.

ALCHEMY, a name now applied to the vain art which had in view the discovery of the elixir of perpetual life, and of the power of transmuting baser metals to gold.

ALCORAN, or The Koran (meaning The Book), a work containing the precepts and disquisitions of Mohammed.

ALGEBRA, the science of computing abstract quantities by symbols or signs. (See article ALGEBRA.)

ALIAS and ALIBI.—Alias, used in the sense of *otherwise* or *at another time*, is applied to a case where a man bears two names, as Brown *alias* Smith. When a party proves himself to have been at a different place when a crime was committed at any given spot, he is said to have proved an *alibi*, or that he was *elsewhere* at the time.

ALKALI, a metallic oxide which changes vegetable blues to green, and forms neutral salts with acids.

ALLUVIUM, a term applied to flat patches of soil, formed by the wearing-down action of moving waters on mountains and other elevated portions of ground.

ALPHA, the first letter of the Greek alphabet.

ALTO-RELIEVO, an expression used by sculptors to designate figures brought out strongly from any surface, or in *high relief*.

ALUMINA, an earth containing alum, and forming the basis of clayey soils.

AMALGAM.—A mixture of mercury with any metal was formerly called an amalgam; but any thorough union of one article with another is now termed amalgamation.

AMAUROSIS, a disease of the eye, consisting in a general dimness of vision, and caused by defects in the power of the retina.

AMBROSIA, the imaginary food of the heathen gods.

AMMONITE, or ammite-stone, a fossil-shell rolled up into a serpentine shape.

AMPHIBIA, a class of animals which exist both in land and water.

ANACHRONISM, an error with respect to the computation of dates or time.

ANAGRAM, the change of any word or set of words into another by the transposition of the component letters. For example, *James Stuart* has been anagrammatized into *A just master*.

ANALOGY, the relation which two different things bear, or seem to bear, to one another from resemblance or respective proportions.

ANALYSIS, the discovery of truth by the resolution of any thing into its fundamental constituents.

ANATHEMA, a term used by ecclesiastical writers, and expressing the separation or cutting off of any person from religious privileges.

ANATOMY, the art of examining into the structure of bodies by dissection. (See the article termed ACCOUNT OF THE HUMAN BODY.)

ANDANTE, an Italian term indicating such a degree of slowness in musical execution that each note is distinct; *andantino* signifies a more gentle rate of execution.

ANEMOMETER, an instrument used for measuring the degrees of force and speed of the wind.

ANEURISM, a diseased swelling on an artery, filled with blood, and resulting from a rupture of one of the arterial coats.

ANIMALCULE, an animal of very minute size.

ANNULAR, a term signifying *ringed* or like a ring. The annular eclipse of the sun is so named from the ring-like shape of that part of the sun's surface left visible by the moon, the relation of the luminaries being then such that the latter and smaller body is placed fairly in front of the former.

ANODYNE, any medicine of sedative or soothing powers.

ANTEDILUVIAN, an epithet for any thing supposed to have existed before the flood.

ANTENNÆ, the horns or feelers of insects.

ANTEPENULTIMATE, the last but two of any number of letters, words, or things.

ANTHOLOGY, a word signifying a collection of flowers, but usually applied to assemblages of short poems.

ANTHRACITE, a valuable species of coal, composed almost wholly of carbon or fossilized wood.

ANTHROPOPHAGI, a word signifying men-eaters.

ANTICLIMAX, a descent or fall, in oratory, or writing, from the great to the little.

ANTIPODES, the people of the earth who live opposite one another, or "foot to foot."

ANTISPASMODICS, medicines alleviative of spasms.

ANTITHESIS, a rhetorical figure, by which contraries are rendered effective through contrast.

APHELION, the point at which any planet is farthest removed from the sun.

APOGEE, the point of the orbit at which the sun, moon, or any planet is most distant from the earth.

APOLOGUE, a fable conveying covertly some important truths.

APOPHTHEGM, a brief, pointed, and forcible saying.

APOPLEXY, a disease resulting from the pressure of blood generally effused upon the brain, and of which the result is paralysis, partial or complete.

APOSTROPHE, a figure in rhetoric, consisting in an address or appeal made to some absent person, as if he were present.

APOTHEOSIS, a classical term expressive of the deification of some person after death.

AQUATINT, a style of etching producing effects similar to those of drawings with Indian ink. (See art. DRAWING.)

ARABESQUE (or Moresque), a style of ornament in sculpture or painting practised by the Arabs, and abounding in foliage, while animal figures are excluded.

ARBORICULTURE, the science of cultivating trees.

ARCANUM, a secret.

ARCHETYPE, the first model of any work.

ARCHITRAVE, that part of a column lying immediately on the capital.

ARGILLACEOUS.—The species of earth called clay, and containing alumine, is styled argillaceous.

ARIOSO, the Italian term for common musical time.

ARITHMETIC, the science of numbers. (See the separate article on that subject.)

AROMA, a name for the odorous principle in spicy shrubs and other plants and flowers.

ARPEGGIO, a word used to signify distinctness of tone in musical language.

ARTERY, the name of the class of vessels which distribute the red or oxygenated blood over the body.

ARTESIAN WELLS.—On boring deeply into the earth in many situations, water is reached, which, being collected from higher grounds, rises spontaneously to the surface, through its tendency to find its level. From being early formed in the province of Artois, such wells have received the name of Artesian Wells. One of the largest is that recently formed at Grenelle, near Paris.

ASAFŒTIDA, a fœtid resinous gum, used in medicine to allay spasmodic irritation.

ASBESTOS, a mineral substance, remarkable for its power of resisting combustion.

ASCARIDES, worms that infest the intestines of animals.

ASCENDANT, in astrology, is the term used to express that degree of the ecliptic which chances to rise above the horizon at the hour of any one's birth.

ASPHALTUM, a bituminous or pitchy substance, found both in lakes and among rocky strata, and recently used for forming pavements.

ASPHIXIA, a term used by physicians to express the fainting or swooning state.

ASSAYING, the process of testing the purity of the precious metals, or the quantity of them contained in any ore.

ASTEROIDS, the name given to the four small planets Vesta, Juno, Ceres, and Pallas.

ASTRINGENTS, medicines which, by their corrugating or constringing powers, strengthen the parts of the animal frame to which they are applied.

ASTROLABE, an instrument for taking the altitude of the heavenly bodies.

ASTROLOGY, an exploded science, which professed to foretell and divine by means of the celestial bodies.

ASTRONOMY, the science which treats of the nature, position, and movements of the heavenly bodies. (See that article.)

ATHENÆUM, a name given in ancient times to a kind of public school and lecture-room, of which several existed in Athens.

ATHLETE, the title bestowed on those who contested at the public games of Greece for the prizes given in reward of superior personal strength and agility.

ATROPHY, a malady marked by the wasting away and emaciation of the body.

AULIC (from *aula*, a hall), the epithet assumed by a high court or council of the German empire.

AURICULAR, the epithet applied to the mode of confessing practised by the members of the Roman Catholic Church, and so named from the Latin word *auris* (the ear), the revelations being whispered, as it were, into the ears of the priests.

AURORA BOREALIS, or the Northern Lights. These meteoric flashes of flame, seen commonly in the north, are ascribed by some to electricity, and by others to reflections from the sheets of polar ice.

AUSCULTATION, the discovery of disease from the internal sounds.

AUTOGRAPH, a word expressing whatever is written by a person's own hand.

AUTOMATON, a name given to any self-acting machine which imitates the movements of living bodies. Machines that imitate the form and motions of man are also called Androides.

AVATAR, a word used by the Hindoos to express an incarnate descent of the god Vishnu upon earth, nine of which descents are held to have been already made, while the tenth is yet to come.

AVIARY, a place devoted to the keeping of birds.

AXILLA, the arm-pit in anatomical language.

AZOTE, the old term for nitrogen gas, the chief component of the atmospheric air.

BALÆNA, the scientific name for the whale tribe.

BALLET, a pantomimic piece, consisting only of action and dancing.

BALUSTRADE, a series of small columns of wood, stone, or metal, united by a cross top or rail.

BANDANA, a species of calico-printing, first practised in India, and originally consisting of light spots impressed on a red or dark ground.

BANIAN-TREE, a vegetable production of the east, which sends down branches that take root in the ground, and themselves become trunks, thus forming, in some cases, a pillared arcade of such enormous extent as to be capable of covering and sheltering a numerous army.

BARBICAN, an outer defence to a city or fort.

BARILLA, a species of crude soda, procured by burning kelp or marine plants, and used in bleaching, as well as in the manufacture of glass and soap.

BAROMETER, an instrument used for marking the variations of weight in the atmosphere, being so constructed that the presence or absence of vapour raises or depresses a column of quicksilver placed upon a graduated scale.

BARYTA, an earth of a ponderous sort, formed of oxygen gas and a metal called barium.

BASILICON, a word applied to a resinous ointment in common use, and signifying an ointment of "sovereign" value.

BASSO-RELIEVO (or BAS-RELIEF), a style of sculpture in which figures are brought out slightly from the surface, or in low relief.

BELLES-LETTRES (Elegant Letters), a French term, now generally applied to polite literature of every description. The branches of knowledge ranged under this comprehensive head by the learned men who established the Lyceum of Arts at Paris in 1792, and gave a definite sense to the term for the first time, were the sciences of grammar, languages, rhetoric, geography, history, antiquities, and numismatics; and to these poetry would certainly have been added, had lectures on that subject been then founded. From the list of the belles-lettres were excluded the mathematical and natural sciences—jurisprudence, ethics, metaphysics, theology, the fine arts, and the mechanical arts. It may be reasonably doubted, however, whether antiquarian literature should be ranked among the belles-lettres, while writings relative to the fine arts are excluded. But the term in question must ever of necessity have a somewhat vague meaning, and it is of little consequence that differences should exist respecting its interpretation. Generally speaking, it may be said that within the range of the belles-lettres are to be included all branches of knowledge or which the imagination and taste are exercised, while a graver name befits the exact and observant sciences, and those generally which call into play the more profound powers.

BELVIDERE, a name given by the Italians to the open tops of houses, which are ascended for the enjoyment of fine prospects and pure air. From being placed in a part of the Vatican bearing this character, the famous antique statue of Apollo is usually called the *Apollo Belvidere*.

BIBLIOGRAPHY, a term signifying a knowledge of books, of the number of their editions, the dates of their issue, and other particulars relative to their publication.

BIBLIOMANIA, a rage or passion for books, particularly old and scarce ones.

BIBLIOTHECA, a word anciently signifying a library, and more lately applied to general accounts of the works that treat of particular subjects.

BIOGRAPHY, the history of the life of any individual, or the art of writing such histories.

BISMUTH, a yellowish metal, very brittle and fusible, and used, on account of the latter quality, for making solder, pewter, and other alloys.

BITUMEN, a soft viscid substance, found both in the vegetable and mineral world, and called, according to its various states of consistence and purity, naphtha, petroleum, tar, pitch, and asphaltum. Bituminous substances are very combustible, and emit a strong odour when ignited.

BIVALVES, a class of shell-fish, comprising those which have shells of two pieces united by a hinge.

BLANC-MANGER, a light article of diet, compounded of milk, sugar, and other ingredients, purified by isinglass, and garnished with blanched almonds.

BLAZONRY, the art of scientifically describing all that belongs to coats of arms or heraldic bearings.

BLOWPIPE, a tabular instrument through which air is blown from the mouth, and which forms a most useful species of bellows to chemists and glass-blowers.

BOLUS, a medicinal mass, resembling a large pill.

BORAX, a salt found in a fluid or dissolved form in nature, and of great value in soldering metals, as well as for other purposes of art and medicine.

BOTANY, that branch of natural history which treats of vegetables, their characters, classes, and varieties. (See article on BOTANY.)

BOUTS-RIMES (rhymed endings), a term for verses formed from a succession of given rhymes or terminatio

BRAVURA, a difficult passage in music, or musical composition, requiring a brilliant and dashing style of singing.

BRECCIA, or pudding-stone, an aggregate substance formed of several varieties of small stones.

BREVIARY, the book containing the Roman Catholic church service.

BRONCHIAL TUBES, the branches or ramifications of the air-vessels in the lungs.

BRONCHOCELE, a tumour in the fore part of the neck over the windpipe.

BRONCHOTOMY, an incision made into the windpipe, to permit of breathing there, when the parts above are closed by accident or disease.

BUCOLIC, a synonym for the epithet *pastoral*, as applied to poetry.

BULBOUS, a term applied to roots of rounded shape, with fibres for the most part at the base.

BURLETTA, a light description of comic drama, named from the Italian word *burlare* (to jest).

BURSÆ MUCOSÆ, a set of small organs which secrete a fatty fluid for the lubrication of joints and tendons.

BURSAR, a pupil in schools, hospitals, or colleges, supported upon a bursary or endowment from the purse (or burse) of the institution, or from funds specially left by some donor for the purpose.

CAABA, a word signifying a *square building* in Arabic, and particularly applied by the Mohammedans to the great temple of Mecca, in which stands a sacred black stone worn down by the lips of the devout worshippers.

CABALA, a mystic science which the old Jewish rabbins pretended to have received by divine revelation, and which was connected with the magical art.

CACHALOT, in zoology, the physeter or spermaceti whale.

CACOPHONY, a bad tone of the voice, or discordant mode of enunciation.

CALCAREOUS, an epithet applied to a species of spar

and to other earthy matters containing lime, or formed wholly of it.

Calcination, the process of reducing bodies to a brittle pulverizable condition by the action of fire.

Calculus, a name given by medical men to stones or concretions found in the body, and commonly deposited either from the bile or the urinary secretion.

Calenture, an old name for a fever incident to sailors in hot climes, and characterized by a desire to rush into the sea on the part of those affected.

Caliber, the diameter of a cannon bore. A word usually spelled *calibre* has sprung from the preceding, indicating *quality* or *degree*. The association betwixt the two words rests in the sense or meaning of *capacity* attached to both. The term *callipers* is from the same source, and signifies a pair of curved compasses for measuring the diameter of cannon, shot, and other rounded bodies.

Calligraphy, properly fine handwriting, but now applied generally to the art of penmanship.

Callus, a term applied to newly-effused bone, or to any hard knob or secretion of an unnatural kind in the body.

Calomel, a compound of oxidized mercury with muriatic acid, named submuriate of mercury, and much used in medicine.

Caloric, the scientific synonym for *heat*.

Calumet, a long reed with a stone bowl used for smoking by the American Indians, and of which there are two kinds, one the calumet of war, and the other that of peace. The Indians smoke with these respectively in a solemn manner, when making hostile or pacific declarations.

Calyx, the cup or chalice which encloses and supports the parts of fructification in flowers.

Cameo, a kind of onyx stone. The term is commonly applied in art, however, to all stones or gems having figures raised in relief upon the surface, and many exquisite specimens of the artistical skill of the ancient Greeks and Etruscans exist in this shape.

Camera Lucida, a contrivance for throwing the image of any body on the wall of a room during sunshine, by means of an aperture in the window-shutter, through which the image of the strongly illuminated object without is received, and, after passing through a convex lens properly placed, is cast on the wall beyond with greater or lesser distinctness, according to distances.

Camera Obscura, a machine resembling an artificial eye, by which images received through a *double* convex glass are exhibited in their native colours on a white space in the focus of the glass. The whole is arranged in a darkened box or chamber, whence the name arises.

Canzone, a song or air in two or three parts, or a lyric of similar length to which music may be composed. *Canzonet* is a shorter piece of the same kind.

Caoutchouc, an elastic gum familiarly termed India rubber, which exudes from the bark of an oriental and South American shrub, and being impermeable to water, is now employed to give that property to articles of dress, as well as for other important ends.

Capillary, a word derived from *capilla* (a hair), and applied to fine delicate tubes in botanical and anatomical language.

Capitation, a term derived from *caput* (the head), and originally used in connection with the word *tax*, to signify an impost laid on per head, or on all persons indiscriminately.

Capsule, in botany, the seed-vessel of plants.

Caracole, a half-wheel made by a person on horseback either to the right or left.

Carat, a weight equivalent to four grains, made use of in weighing diamonds. Gold is also said to be fine or otherwise in proportion to the number of carats which it retains or loses in purifying.

Carbon, the pure part of charcoal, an elementary or simple body which exists to a vast extent in vegetable substances, as well as in the atmosphere, and in earthy stratifications. One of its chief compounds is *carbonic acid gas* (a compound with oxygen gas); and further compounds, called *carbonates*, are formed by that acid with lime and other bodies. Other compounds of pure or simple carbon with various substances are called *carburets*.

Carbuncle, a name for a fine red gem; and also for a deep purplish tumour frequently occurring on the surface of the human body.

Carminatives, medicines which relieve flatulency and spasm.

Carnivorous, an epithet applied to animals which feed on flesh.

Carotid Arteries, the two arteries which carry the blood from the heart to the head, and which are liable to be severed in the case of any deep wound in the neck.

Carte-blanche, a term applied to a piece of blank paper, signed by any party who wishes to give another full powers to act in the name of the subscriber.

Cartilage (or gristle), a substance of hard consistence, yet softer than bone, which is chiefly of use in the animal frame as a means of joining two or more portions of the latter material. Cartilaginous is an epithet applied to that class of fishes which have skeletons of cartilage instead of bone.

Cartoon, a design drawn upon paper for the purpose of being traced afterwards upon any other substance, as the famous cartoons of Raphael were designed for tapestry.

Caryatides in sculpture, columns imitating the bodies of women clothed in the Caryan dress.

Catacomb, subterranean grottoes or vaults for the reception of the bodies of the dead.

Catalepsy, a kind of paralytic seizure, during which the person affected is speechless, senseless, and to all appearance dead; with this difference, that on raising any of the limbs, it rigidly retains the position given to it, however awkward.

Cataplasm, a synonym for a poultice.

Cataract, a fall of water; in medicine, an affection of the eye, consisting in a thickening of the crystalline lens or its enclosing membrane.

Catarrh, a defluction from the nose, throat, or windpipe, constituting one common shape of the complaint termed a cold.

Catastrophe, a term originally signifying the winding up of a play, and now applied to the close of any event or course of events, particularly of a calamitous description.

Category, a class or order of ideas or attributes; or, in common speech, a list or series.

Catholic, an epithet properly signifying *universal*, and bestowed with that sense on the Church of Rome in early times.

Catholicon, a supposed *universal* remedy for diseases.

Catoptrics, that branch of the science of optics which treats of the properties of reflected light.

Caustics, a class of drugs of so acrid a nature—as, for example, nitrate of silver (lunar caustic)—that they corrode the animal texture, and create breaches of the surface.

Caviare, sturgeon-roes, salted and preserved as a condiment in some parts of Europe.

Cellular Membrane, a thin layer of celled network, filled with a fatty fluid, and forming the intermediate texture between the layers of skin, the muscles, and, in short, all the organs of the body.

Cenotaph, a monument to the dead, differing from a sepulchre in containing no body.

Centipede, an insect with a hundred feet.

Centrifugal, an epithet expressing the tendency of bodies moving in a circle to fly off from the centre.

Centripetal, a term signifying the bent of bodies kept in circular motion, to gravitate towards the centre.

CEREBELLUM, the two posterior lobes of the brain, divided by a strong partition from the

CEREBRUM, or larger portion of the brain, occupying the upper and fore part of the skull.

CHALYBEATE, a term applied to those mineral springs which hold iron in solution, such as the springs of Moffat and Tunbridge.

CHARADE, a species of puzzle, which calls upon the solver to find out some particular word from a hint given of its syllabic constituents severally.

CHARLATAN, a quack, empiric, or boastful pretender to gifts not possessed.

CHEMISTRY, the science which investigates into the nature and properties of material bodies. (See article on CHEMISTRY.)

CHIARO-SCURO, two Italian words signifying *clear-obscure*, and indicating the distribution of clearness and obscurity, or light and shade, in paintings.

CHIROMANCY, the art of divination by examining the lines of the palm or hand.

CHLORINE, one of the simple or uncompounded gases, of strong corrosive powers, and used in bleaching, chiefly in the shape of those compounds of it called *chlorides* and *chlorates*.

CHROMATICS, that branch of optics relating to the colours of rays of light.

CHRONIC (from *Chronos*, time), an epithet applied to any thing that has been of long duration.

CHRONOLOGY, the science which examines into the divisions of time. (See article on CHRONOLOGY.)

CHRYSALIS, the state (otherwise named that of *nympha*, *pupa*, or *aurelia*) into which an insect passes while spinning its cocoon, and changing from a worm to a perfect insect.

CHRYSOLITE, a mineral of green tint, often transparent, and found both in the shape of grains and crystals.

CHYLE, a fine white fluid, into which the food is converted by digestion previously to its assimilation with the blood.

CHYME, a fluid into which the food is changed preparatorily to its conversion into chyle.

CIRRHUS, the term indicating clouds of a feathery or hairy aspect and shape.

CLAVICLE, the scientific name for the shoulder-blade.

CLERICAL, a term which, besides its modern and ordinary sense of "belonging to the clergy," is also used as an epithet for errors of the press, from the circumstance of *clerks*, or transcribers of manuscript, being answerable for such errors in early times. All writers and scholars, moreover, were anciently called clerks.

CLIMACTERIC, a term commonly used to signify a critical and advanced period of life. The ages of sixty-three and eighty-one have been deemed the climacterics of man, and the latter term has been specially called the *grand climacteric*.

CLIMAX, a figure in rhetoric expressive of the gradual and connected rising of a sentence or passage till it closes in a point which clinches forcibly all that precedes it.

CLINICAL, a word applied to medical lectures, the materials of which have been gathered at the actual bedsides of patients.

COBALT, a brittle metal of a grayish-white hue, used in an oxidized state for giving a lasting blue colour to enamels, porcelain, and the like articles.

COCOON, the silken or thready case which insects spin around themselves in assuming the chrysalis state, and which forms so valuable an article in the instance of the silk-worm.

COLEOPTEROUS INSECTS, a class of beetles, so named scientifically from their being sheath-winged.

COLLECTANEA, a word signifying any notes, extracts, or comments, referring to a collection of works.

COLLYRIUM, a lotion for the eyes.

COMATOSE, an epithet derived from the term *coma*, indicating a state of lethargic drowsiness or stupor.

COMMENDAM.—When an ecclesiastical benefice is temporarily intrusted to a layman for any secular purpose, or to one clergyman to hold till the regular incumbent is appointed, it is said to be given *in commendam* to such parties.

COMMISSARIAT, the department of the commissaries of an army, or those officers who have the charge of furnishing the troops with the necessaries of life.

COMPOSITE, the term for the fifth order of columnar architecture, so named from its capital being composed out of those of the other orders.

CONCENTRIC, an epithet given to figures or circles having a common centre, like those formed by dropping a stone in water.

CONCHOLOGY, the science which treats of shells and shelled animals.

CONCORDANCE, an index comprising every word in a book, and giving reference to every place where it is to be found.

CONDUCTOR, in the language of electrical science, a substance which transmits the electrical fluid readily. Non-conductors are bodies which have the opposite quality. The majority of metals are good conductors, and glass is a good specimen of a non-conducting substance.

CONGLOMERATE, a term in mineralogy for a stone compounded of quartz, siliceous slate, flint, and other stones.

CONVEYANCING, the profession of drawing up deeds conveying property.

CONVOLUTED, a term signifying "rolled one upon another."

CORDON, a line drawn around a military force or infected spot, and called in the latter case a sanatory cordon.

CORNEA, the transparent membrane on the fore part of the ball of the eye.

CORNUCOPIA, the horn of plenty, in the language of classical mythology.

COROLLA, the coloured part of a flower, composed of the petals.

COROLLARY, an inference from certain given premises.

CORTICAL, any thing belonging to the bark, rind, or outer covering of bodies.

COSMOGONY, the science that treats of the origin of the world.

COSMOPOLITE, a citizen of the world.

COUCHING, the operation for curing cataract by turning the opaque lens out of the axis of vision.

CRANIOLOGY, the science which investigates into the structure and divisions of the skull.

CRANIOSCOPY, the art of discovering the internal organs of the brain by observing and measuring the outward protuberances.

CRANIUM, the bony case enclosing the brain.

CRATER, the mouth or opening of a volcano.

CRETACEOUS, a synonym for the term *chalky*.

CRUCIBLE, a pot usually made of clay, and employed in melting substances, or exposing them to a strong heat.

CRUSTACEOUS, an epithet applied to those fishes which are covered by jointed scaly shells.

CULMINATION, a term expressing the attainment of the highest point of daily altitude by any heavenly body.

CUNEIFORM, a word signifying formed like a wedge.

CUPOLA, the dome or vaulted roof of a building.

CUSPIDATED, spear-pointed.

CUTANEOUS, of or belonging to the skin.

CUTICLE, the outer or scarf-skin, which is very thin and insensible.

CYCLE, a continual revolution of numbers, applied to a series of years which go on for a certain period, and then return to the same starting point, thus circulating perpetually.

CYCLOPÆDIA, a word expressing the cycle or entire compass of the arts and sciences.

CYLINDER, a long circular body of uniform diameter such as a gun-barrel.

CYNANCHE, an inflammation of the larynx, familiarly called a quinsy or sore throat.

DA-CAPO, a term implying that a musical piece is to be repeated.

DACTYL, a poetic foot or division of a line, consisting of a long syllable and two short ones.

DAGUERREOTYPE, a recent invention of M. Daguerre of Paris, by which external objects are made to impress their image on a surface of silver or paper prepared for receiving it by certain coatings extremely sensible to light, and of which iodine is the basis. The process is conducted by means of a camera obscura.

DECADE, any thing numbering ten, as ten years or ten days.

DECAHEDRON, a figure having ten sides.

DECALOGUE, the ten commandments of the Jewish Scriptures.

DECAMERON, a work of which the supposed action occupies ten days, such as Boccaccio's Decameron, the hundred tales of which are described as employing ten days in the narration.

DECIMATION, the execution of every tenth man in a body of men, a mode of punishment inflicted by the Romans on mutinous and cowardly soldiers.

DELIQUESCENCE, spontaneous liquefaction on exposure to the atmosphere.

DEMOCRACY, properly a form of government in which the people hold power collectively. *Democratic* is an epithet having virtually the sense of ultra-republican.

DEMONOLOGY, a discourse on demons.

DEMULCENTS, drugs which soothe irritation and diminish acridity.

DENTAL, of or belonging to the teeth.

DENTATED, tooth-like.

DENTIFRICE, a preparation for cleansing the teeth.

DEODAND, a word meaning "given to God," and applied to fines allotted to pious ends.

DESIDERATUM, any thing not possessed, but desired.

DETONATION, a report made by the explosion of combustibles.

DIACHYLON, an adhesive and softening plaster.

DIAGNOSTICS, a term given to the signs by which diseases are recognised by physicians.

DIAGONAL, a line drawn from one angle of a figure to another.

DIAGRAM, a scheme or series of figures, drawn for the purpose of illustrating any proposition.

DIALECTICS, the art of logic.

DIAMETER, a right line passing through the centre of any curvilinear figure.

DIAPASON, in music, the interval of an octave.

DIAPHRAGM, the strong muscular partition dividing the chest from the intestinal region.

DIAPHORETICS, medicines which cause perspiration.

DIARRHŒA, a billious flux from the intestinal canal.

DIETETICS, the science which has reference to the arrangement of the diet.

DILETTANTE, an amateur of letters and the arts.

DILUVIUM, a term applied to strata or soils bearing marks of the action of a deluge.

DIOCESAN, a bishop, or one who has charge of a diocese.

DIOPTRICS, the science which considers the subject of refracted light.

DIORAMA, a word from the Greek signifying "to see through." Exhibitions of large paintings have received this name, when arranged with an open stage-like front and a shifting light from above, so as to give the effect of distance and change of time to the paintings displayed.

DIPLOMA, a document conferring some honour or privilege.

DISPENSATORY, an authorized collection of receipts, by which medicine may be compounded; also a place where they are dispensed.

DIURETICS, medicines which promote the urinary secretion.

DIVINATION, the exploded art of foretelling things to come, by ceremonies of various kinds.

DOMINICAL DAYS, a term for Sun days, signifying, etymologically, "days of the Lord." The letter denoting the Sabbath in calendars is named the *Dominical letter*.

DOMICILIARY, an epithet often applied to visits made by *authority* to private domiciles.

DOMINO, a game played with ivory pieces; and also a long mantle used at masquerades.

DORIC, a term bestowed on language of a simple and rustic order, such as that used by the ancient Dorians. The *Doric* is one of the architectural orders, and is noted for simplicity and strength.

DOXOLOGY, a hymn in praise of the Almighty.

DRAGOMAN, an oriental interpreter.

DRASTIC, an epithet given to aperient medicines which act powerfully.

DUET, an air in two parts.

DUODECIMO, a name applied to books having twelve leaves to a sheet; duodecimals are numbers counted by twelves.

DUPLICATE, a second copy of any thing.

DURA MATER, a strong membrane enclosing the brain, and dividing some parts of it into separate sections.

DYNAMETER, an instrument for determining the magnifying power of telescopes.

DYNAMOMETER, a machine which measures the strength of the human or animal frame.

DYSENTERY, an intestinal disease, accompanied with severe fluxes, partly of blood.

DYNAMICS, the science which considers of moving powers and the motions of bodies, with their relations and mutual reactions.

DYSPEPSIA (or Dyspepsy), a medical term for the malady of disordered digestion, which lies at the bottom of so many other diseases.

EASTER, a Christian festival commemorative of the resurrection of Jesus Christ, and celebrated on the Sunday following the first full moon after the 21st of March. No better etymon can be found for the word Easter than the name (Ostera) of a Pagan goddess.

ECCHYMOSIS, a blue mark caused by blood effused under the skin.

ECLECTICS, philosophers who are of no sect, but choose the best portions from the collective doctrines of others.

ECLIPTIC, the apparent orbit of the earth, or that circle in the heavens through which the earth would seem to move if seen from the sun.

ECLOGUE, a simple pastoral poem, where shepherds are introduced in discourse.

EFFLORESCENCE, the flowering of plants; in chemical language, the formation of small white grains on the surface of bodies.

EFFLUVIUM or EFFLUVIA, the minute particles "flowing out of" or exhaled from bodies, as in the case of putrefying matter. It is common, also, to attach the meaning of a strong odour to the term.

ELECTRICITY, a word taken from *electron* (amber), because that substance was early observed to attract other bodies, when excited by friction. This action was found to depend on a remarkable principle, commonly called the electric fluid, and existing more or less in all material bodies in a latent state, when it is impalpable to the senses. When drawn from bodies, it assumes the appearance of a spark or streak of light. The electric fluid travels with vast rapidity, is the source of thunder, and bears striking relations to the galvanic and magnetic principles, as well as to light, heat, and the vital power itself. (See article ELECTRICITY.)

ELECTRO-MAGNETISM, the science which treats of elec

tricity and magnetism, and the relations existing between them.

ELECTUARY, a name given to medicinal preparations, consisting of powders, or such like dry substances, mixed up with some syrup or conserve.

ELEEMOSYNARY, an epithet for whatever pertains to or is sustained by charity.

ELEGY, a short poem, essentially of a pensive cast.

ELIXIR, a liquid essence or extract of any substance.

ELLIPSIS, an oval figure; in grammar, an omission of words easily supplied by the reader.

EMBARGO, a prohibition to sail laid on shipping.

EMBOSSING, the graving of words in relief, or the working of embroidery.

EMBROCATION, a name for medicinal liquids used for rubbing sprains and other external ailments.

EMBRYO, the rudiment or germ of animal or vegetable bodies.

EMETIC, a vomitory drug.

EMOLLIENTS, medicines which soften and supple the parts brought into contact with them.

EMPIRIC, a name applied to quacks of every species, and chiefly to pretenders in medicine.

EMPORIUM, a word usually bestowed on any great centre of commerce, or of a branch of commerce.

EMPYREAN, the heaven of heavens; whence the adjective empyreal, signifying aërial or celestial.

EMULSION, a milky medicinal mixture, formed of oil and water, or mucilaginous.

EMUNCTORY, any part of the body which carries off excretions, as, for example, the nostrils.

ENCYCLOPÆDIA, a term now generally given to dictionaries embracing a view of all the arts and sciences.

ENTOMOLOGY, that department of zoological science which relates to the natural history of the insect world. (See articles on ZOOLOGY.)

EPHEMERA, the day-fly, so called from its existing but for one day. Hence the use of the epithet *ephemeral* in the general sense of short-lived or transitory.

EPHEMERIS or EPHEMERIDES, a tabular almanac, showing the state of the heavens and heavenly bodies for every day at noon.

EPIC POEM.—The *epos*, or epic poem, is a composition which relates to the life of some hero or eminent person, and treats of great events in a grave and lofty style. It is considered as the grandest species of poetry. The subject or plot is termed the *Epopeia*.

EPIDEMIC, a disease which affects a large number of persons in the same locality at one time, lasts for irregular periods, and is in most cases contagious.

EPIGASTRIC, of or belonging to the upper abdominal region.

EPIGLOTTIS, the cartilaginous lid which covers the top of the windpipe in swallowing.

EPIGRAM, a short poem, terminating in a witty point, and commonly satirical.

EPILEPSY (or falling sickness), a nervous disease, marked by convulsions and loss of sensation.

EPILOGUE, an address affixed to the end of a play.

EPISCOPACY, that form of church government in which authority is in the hands of *episcopi* or bishops.

EPISODE, an interjectional story or passage in any composition, connected more or less with the main narrative.

EPITHALAMIUM, a nuptial song.

EPITOME, a summary or compendium of any thing.

EQUATOR, a great circle, equally distant from the poles of the earth, and dividing it into two equal sections.

EQUILATERAL, equal-sided.

EQUILIBRIUM, in mechanics the condition of equality of weight.

EQUINOX, the period when the sun enters the point of the heavens above the equator, making equal night and day over the globe, whence that point is called the *equinoctial* (equal-nighted) line.

ERYSIPELAS, an eruptive and highly inflammatory disease, vulgarly styled St. Anthony's Fire.

ESCHAROTIC, a caustic application, which forms an *eschar* or scar on the skin.

ESCULENT, a term applied to roots and plants which may be eaten.

ESOTERIC, an epithet given to private instructions like those, so called, of Pythagoras.

ETHICS, moral philosophy, or the science which treats of morals and manners.

ETHNICAL, of or belonging to heathenism.

ETIOLATION, the process of blanching.

ETYMOLOGY, a branch of learning which has reference to the derivation and radical meaning of words.

EUCHARIST, the sacrament of the Lord's Supper.

EUDIOMETER, an instrument for ascertaining the composition and purity of air.

EUPHONY, a sweet sound or enunciation, whence the adjective *euphonious*.

EXEGESIS, an illustrative discourse.

EXFOLIATION, a surgical term expressing the casting off of a portion of diseased bone from the sound parts.

EXOTIC, an epithet for any thing of foreign origin.

EXPECTORANTS, medicines which promote the discharge of fluid matters from the chest.

EXPERIMENTUM CRUCIS, a decisive experiment.

EXTRAVASATION, the discharge of blood from a vessel below the surface of the body.

EXUVIÆ, the cast skins or coverings of animals, or refuse of any similar kind; also the organic remains found in the strata of the earth.

FALSETTO, in music, the species of vocal sounds produced by straining the voice above its natural compass.

FANTASIA, a term for an unpremeditated piece of irregular music.

FARINA, meal or flour; also the fine dust found on flowers.

FASCICULUS, a medical synonym for a handful or small bundle; also a term given to a part of a book or a short treatise.

FATALISM, the belief in an irresistible destiny.

FEBRIFUGE, a drug which dispels fever.

FELSPAR, crystallized mineral, compounded of silica, alumina, and potash, and gray or reddish in appearance.

FELUCCA, a light open boat with six oars.

FEMME COUVERTE, a title for a married woman, used in law to indicate the protection from personal liabilities resulting from that condition.

FERRUGINOUS, rusty, or of the colour of iron rust.

FERULE, a rod of correction.

FESCENNINE VERSES, a species of poems first composed at Fescennia, in Tuscany, and which, from their licentious character, have caused the term to be given to subsequent productions of the same description.

FIBRINE, a whitish body, insoluble in water, which forms the chief or fibrous part of muscles.

FIBULA, the smallest of the two bones of the leg below the knee.

FIMBRIATED, fringed, or fringe-like.

FIRMAN, a passport for travel and trade in the east.

FISCAL, of or belonging to the revenue of prince or people.

FISTULA, a deep ulcerated hole or canal.

FLUORINE, the basis of a very corrosive acid called the *fluoric*, which with lime forms the fluor spar so abundant in Derbyshire.

FLUXIONS, that branch of algebra which treats of the velocity with which the fluents or flowing quantities increase or decrease.

FOCUS, the point to which the rays of light or heat converge after being reflected or refracted, often also called the focal point.

FŒTUS, the embryo of young animals, advanced so far as to possess form and shape.

FOLIATED consisting of thin plates or leaves.

FOLLICLE, a seed-vessel open at one side, and having the seeds loose in it.

FORMULA, a prescribed rule or creed.

FORENSIC, a word applied to legal oratory, from judicial courts being held in the Forum of Rome.

FOSSIL, any substance of which the pores have been so penetrated by earthy or stony matter that the consistence seems altogether changed.

FRESCO, a durable method of painting in distemper or size colours on walls.

FRUCTIFICATION.—The parts of fructification, in botany, are those devoted to the propagation of vegetables, and consisting of the flower and the fruit.

FUCUS, the name formerly given to sea-weeds of the class from which kelp is procured.

FULCRUM, in mechanics, the prop or support on which the lever rests.

FULMINATION, a word expressing a very loud explosion and applied to the report given on ignition by mercurial and other preparations, called fulminating powders.

FUMIGATION, the dissemination of smoke or fumes for the purification of apartments, clothes, or other articles supposed to be infected by noxious effluvia.

FUNGUS, a class of vegetables of extremely rapid growth, which spring up in the form of excrescences from decaying matter.

FUSES, a small tube filled with combustibles, used for the discharge of bombs and fireworks.

GALAXY, the astronomical name for the accumulation of stars forming the Milky Way, familiarly used to signify any assemblage of bright objects.

GALLINÆ (GALLINACEÆ), the scientific epithet for the pheasant tribe, which includes the common domestic fowls of Britain.

GALVANISM.—This term is derived from an Italian philosopher named Galvani, who discovered that certain metals develop a peculiar power, which resembles the electric fluid in its effects. His discovery subsequently led to the formation of the Galvanic Battery, in which machine plates of zinc and silver are arranged in pairs, with a saline solution between each pair; and from which the galvanic fluid may be drawn off by conductors, giving a smart shock to the animal frame similar to that caused by electricity. The electro-galvanic fluid, as it is called, has been found of great use to chemists in decomposing compound bodies, as well as for other purposes.

GAMUT, table or scale of notes in music, marked by the monosyllables, *ut, re, mi, fa, sol, la,* and *si.*

GANGLION, a hard swelling, found on the course of tendons, and most frequently appearing upon the hand or wrist; also a knob upon the course of nerves.

GANGRENE, the name applied to the first stage of mortification, before the vitality is completely gone.

GASTRIC, the epithet given to the juice from which the digestive powers of the stomach are derived.

GASTRONOMY, the "science of the stomach," or of eating.

GELATINE, a jelly or soft substance, obtained by boiling either the soft parts or bones of animal bodies. Glue and isinglass are almost wholly composed of gelatine.

GENEALOGY, a history of the descent of any person or family.

GEOGNOSY.—This word signifies a "knowledge of the earth," and has been used by writers to express that branch of science which takes cognisance of the natural history of the substances composing the earth's crust.

GEOGRAPHY, a description of the surface of the earth, its natural divisions and general characteristics.

GEOLOGY a word signifying a "discourse on the earth," and applied to the science which treats of the structure of the crust of the globe, and the changes undergone by its constituent parts.

GEOMETRY, a term which properly means the art of "measuring land," but is applied to that branch of mathematics which considers of magnitudes generally, or the properties of dimension and figure.

GEORGICS, books treating of the art of tilling the earth, as those of Virgil.

GERMINATION, the act or process of sprouting forth, applied to plants.

GIBBOUS, an epithet bestowed on the moon when the dark part is horned in shape, during the change from full to new.

GLACIERS, vast fields of ice or concrete snow, which are formed in the hollows between lofty mountains, and abound in the Swiss and Tyrolese Alps.

GLAND, a name given to all those organs of the body, large or small, which separate a secretion from the blood, and have ducts to secrete it.

GLOTTIS, the opening at the top of the windpipe.

GLUTEN, an elastic and tenacious substance, found largely in flour and other vegetable bodies, and resembling glue.

GLUTINOUS, an adjective signifying something soft and adhesive.

GNEISS, in mineralogy a species of rock having a slaty texture, rich in metals, and found in many countries lying immediately over the great mountain masses of granite.

GNOMON, the erect style or pin of a dial, which indicates the hour by its shadow.

GOITRE, a large tumor on the fore-part of the neck, characterizing an unhappy class of weak-minded beings who reside in Alpine districts, and are generally named Cretins.

GOTHIC, a title applied to a species of architecture, chiefly marked by pointed arches and sharp angles, and admitting of much sculptural decoration.

GRADIENT, a word now used to denote the deviation of railways from a level to an inclined plane.

GRALLÆ (GRALLATORES), the scientific name for birds of the same class with the crane, or wading-birds.

GRANITE, a hard rock, usually grayish, but varying considerably in colour, and considered as of volcanic origin and great antiquity. It is the fundamental rock of the earth, on which the others lie, though it shoots up to the surface both in lofty mountain-ranges and low-lying grounds. Its compact and uniform texture renders it easily discoverable.

GRANULATION, the process of forming into grains; a word which is applied to the small specks of red flesh which spring up in healing sores.

GRAVITATION, the law of attraction by which bodies fall to the earth in the direction of its centre, and by which, moreover, the planets themselves are kept moving in their fixed relations to the sun.

GREYWACKE, a composite rock of a grayish colour, resembling a sandstone mixed with various minerals.

GREGORIAN, a name applied to the arrangement of the calendar year made by Pope Gregory, and familiarly called the change from the old to the new style.

GUTTA SERENA, a disease or defect of the optic nerve, causing blindness.

GYMNASIUM, the place appointed among the Greeks for the athletic exercises of their youth, and named from *gymnos* (naked), because some of these exercises were performed in that condition. Gymnastics is a term derived from the preceding, and is synonymous with "athletic exercises."

GYMNOTUS, the electrical eel.

GYPSUM, a substance composed of sulphate of lime, and found largely in the stratifications of the globe.

HÆMORRHAGE, a bleeding or flux of blood.

HALO, a white or luminous ring appearing round any of the constellations.

HARMONICA, a musical instrument formed of cup-like glasses, from the brims of which the music is elicited by rubbing with the fingers.

HEBDOMADAL, or HEBDOMADARY, weekly, or recurring every seven days.

HECATOMB, among the Greeks, a sacrifice of a hundred oxen.

HECTIC FEVER, a slow fever, marked by emaciation of the body, a quick weak pulse, and a frequent flush on the cheeks.

HEGIRA, the epoch of Mahomet's flight from Mecca, which took place on the 10th July, 622. From this term is dated the series of eastern years of 354 days.

HEMISPHERE, half a sphere.

HEMISTICH, in poetry, a line left half completed.

HEPATIC, an epithet for any thing pertaining to the liver. Hepatic air is a term for inflammable air in chemistry.

HERBARIUM, a collection of dried plants.

HERBAL, a work giving a summary view of plants.

HERMAPHRODITE, a term applied to plants which have the material parts of fructification within the same receptacle.

HERMETICAL, an epithet for any mode of sealing bottles or similar articles, which effectually excludes all foreign bodies, gaseous or fluid.

HERNIA, an intestinal rupture.

HEXAMETER, a Latin line of six feet.

HIERARCHY, a term signifying "holy" or ecclesiastical government.

HIEROGLYPHICS, symbols substituted for words by the Egyptians to prevent the vulgarization of their sacred learning, and for other purposes of concealment.

HIEROPHANT, a name for the Greek priests who had care of the sacrifices and sacred rites.

HISTRIONIC, of or belonging to the stage or dramatic performers.

HOLOCAUST, a burnt-offering, or sacrifice consumed by fire.

HOLOGRAPH, a deed or testament wholly written by the hand of the testator.

HOMŒOPATHY, a system of medicine which upholds natural diseases to be curable by similar artificial ones, or by such medicines as would produce them; and which prescribes remedies also in infinitely small doses.

HOMOGENEOUS, of the same or a uniform nature.

HOMOLOGOUS, of the same manner or proportion.

HORIZON, the line that terminates the view of the heavens from any spot, and divides them into an upper and lower hemisphere; whence the adjective horizontal, applied to any straight line which would form a right angle with one descending perpendicularly from above.

HORNBLENDE, a slaty stone usually of blackish-green tint, abundant in Britain.

HOROLOGY, the art of measuring time.

HOROSCOPE, the configuration of the heavenly bodies at the time of any one's birth, whence his fate was supposed to be discoverable.

HORTICULTURE, the art of cultivating gardens.

HORTUS SICCUS (literally, a dried garden), a collection of specimens of preserved plants.

HOURIS, exquisitely beautiful females, said by Mohammed to dwell in Paradise.

HYBRID, a mule, or creature sprung from parents of different races.

HYDATIDS, small bag-like bodies, filled with fluid matter, which are sometimes found in animals, and are themselves thought to be animalcules.

HYDRAULICS, the science which treats of the motion of fluids, and the art of conveying water.

HYDROCEPHALUS, the disease commonly called water in the head.

HYDROCYANIC ACID, a deadly poison, otherwise termed Prussic acid.

HYDROGEN, an elementary gas, the lightest of known bodies, which forms water with oxygen gas. It is inflammable and is used to elevate balloons.

HYDROGRAPHY, the science which describes gulfs, lakes, rivers, and other accumulations of water.

HYDRODYNAMICS, the science which treats of the states and forces of liquids in motion or at rest. It comprehends both hydraulics and hydrostatics.

HYDROPHOBIA, the disease of canine madness, marked by a dread of water, as the name radically implies.

HYDROSTATICS, the science which takes cognisance of the weight and equilibrium of fluids.

HYGEIST, a professor of the art of healing.

HYPERBOLA, a section of a cone in geometry.

HYPERBOLE, a figure of speech consisting in an exaggeration of any sentiment to give it greater force. It is a figure much in use. A man cannot complain of cold but he is "cold as ice," or of heat but he is "broiling."

HYPERBOREANS, the people living in the regions of the extreme north.

HYPERCRITIC, a personage finically fastidious, or critical to a superfluous excess.

HYPOCHONDRIAC, a person affected with indigestion and labouring at the same time under low spirits and unnecessary fears.

HYPOTHENUSE, the longest side of a right-angled triangle, or that subtending the right angle.

HYPOTHESIS, a theory; or a principle assumed whence from to draw certain inferences.

HYSTERICS, a nervous and convulsive disease, chiefly attacking females, and liable to be brought on by strong mental emotions.

IAMBIC, a metrical foot or division of a line of poetry, consisting of a long and short syllable. Iambic verses are lines composed of a succession of such syllabic divisions.

ICHOR, a thin watery humour, such as exudes from a particular species of sores.

ICHTHYOLOGY, that branch of zoological science which treats of fishes, their structure and varieties.

IDES, eight days in each month of the Roman calendar, beginning in some with the fifteenth and in others with the thirteenth day.

IDIOSYNCRASY, a peculiarity of constitution or temperament confined to an individual.

IDYL, the name assigned to short pastorals by several writers of them among the Greeks.

IGNIS FATUUS, a title for the Will-o'-the-Wisp, or phosphorescent light springing from marshy grounds by night.

IGUANODON, an extinct animal of the *Iguana* or lizard species, the fossil remains of which indicate its length to have been extraordinary, not less perhaps than fifty or sixty feet.

ILIAC PASSION, an obstruction of that portion of intestine called the *ilium*, attended with great pain and danger.

IMPOSTHUME, an abscess, or collection of purulent matter in the interior of the body.

IMPROVISATORI, persons who compose and recite poetry extemporaneously, according to a long prevalent Italian custom.

INCANDESCENCE, the state commonly called a *white heat*.

INCUBATION, the process of hatching.

INCUBUS, a synonym for the nightmare.

INFLUENZA, a species of epidemical catarrh, so styled either because it was ascribed to the influence of the stars, or on account of the wide extent of its influence.

INFUSORIA, in entomology, a term applied to the class of animalcules discovered by the microscope in stagnant water and other fluids.

INGUINAL, of or belonging to the groin.

INORGANIC, any thing without natural vitality, or possessing no organs. Under this head are included all material substances not pertaining to the animal or vegetable kingdom.

INSECTIVOROUS, an epithet for creatures which feed on insects.

INTAGLIOS, gems on which heads or inscriptions are engraved, as on the stones of ancient rings.

INTEGER, a whole, as opposed to a fraction.

INTERCALARY, the epithet given to the 29th of February, a day introduced every fourth year into the calendar.

INTERCOSTAL, a term applied to such parts as lie between the ribs.

INTERLUDE, a light piece introduced on the stage between the principal performances.

IODINE, a simple or uncompounded body, having the form of black lustrous scales, and used extensively in medicine for the reduction of swellings in the glands of the body.

IONIC, an epithet for one of the architectural orders regarded as forming a mean between the lighter and stronger ones.

IPECACUANHA, a medicinal root, used in a dry and powdered state as an emetic.

IRIS, in anatomy, the contractile circle which surrounds the pupil of the eye, so called because, like the rainbow (styled by the Greeks *Iris*), it varies in colour.

JUGULAR, the epithet distinguishing two large veins, called external and internal, which lie on each side of the neck.

JURISCONSULT, a person learned in the laws.

JURISPRUDENCE (medical), that branch of medical science which takes cognisance of the bodily injuries resulting from assaults, poisoning, and the like causes, with a view to the attainment of the ends of justice.

KALEIDOSCOPE, an optical instrument invented by Sir David Brewster, and consisting of a tube, with slips of glass so arranged in the interior that small heads, pieces of coloured glass, and similar substances, are thrown into an endless variety of shapes, and are very useful in suggesting patterns to cotton-printers and other tradesmen who manufacture figured articles.

KORAN (Alcoran), the book containing the doctrines of Mohammed.

KRAKEN, a supposed sea-animal of vast bulk, the descriptions of which give to it long arms or tentacula like those of the cuttle-fish.

KREOSOTE, an anti-putrescent principle extractible from vinegar, used for relieving toothache.

LABIALS, the letters formed in pronunciation by the lips.

LACHRYMATORY, a small vessel anciently used for collecting the tears shed on the death of friends, in order to their being placed in the funeral urn. The word is from *lachryma*, a tear; whence also the adjective *lachrymal*, applied to the ducts and glands of the eye.

LACTEALS, vessels which convey the chyle to a duct leading into the blood-vessels.

LAMINA, a plate, whence the epithet *laminated*, of which *lamellated* is the diminutive.

LARVA, the grub or caterpillar state of insects.

LARYNX, an assemblage of cartilages in the windpipe, by which the voice is formed.

LATITUDE, the distance of any place from the equator, marked by degrees of 360 miles.

LATITUDINARIAN, a free-thinker, or one who indulges in great latitude of thinking on any subject.

LAUREATE, the name given to the court-poet of Great Britain, a pensioned functionary.

LAZARETTO, an Italian term, applied to hospitals for persons affected with contagious diseases.

LEGATION, the body of persons composing an ambassador's suite.

LEGUMINOUS, an epithet assigned to certain vegetables, such as the pea, of which the seed-vessels are in the form of pods.

LENS, in optics, a piece of glass or other transparent substance, so formed as to make the rays of light either diverge or converge, in order, respectively, to magnify or diminish objects viewed through the lens. It is by means of the crystalline lens that external objects are pictured on the retina or sentient part of the eye, and vision is effected.

LEONINE, an epithet given to Latin lines, of which the middle rhymes with the end.

LEVIGATION, the process of grinding substances with water, so as to make a paste.

LEXICON, a dictionary.

LIAS, a name given to a species of stratified clay abounding in organic remains.

LICHEN, a species of moss.

LIGAMENT, a strong flexible substance, which serves to bind together the bones of the body.

LINIMENT, any medicinal liquid of a thickish consistence, used as an external application.

LITERATI, men of letters.

LITHOGRAPHY, the art of writing or engraving on stone, for the purpose of taking copies or impressions.

LITHOTOMY, the operation for extracting stones from the bladder.

LIXIVIATION, the process of separating soluble from insoluble matters by repeated washings with water.

LIXIVIUM, the water holding substances obtained by lixiviation.

LOGARITHMS, the exponents of a series of powers and roots. (See article on ARITHMETIC and ALGEBRA.)

LONGITUDE, in geographical science, the distance of any place from a first meridian, as that of Greenwich, taken east and west.

LUMBAGO, rheumatism in the lumbar region or loins.

LUNAR CAUSTIC, nitrate of silver, a preparation that burns or corrodes the animal substance.

LUSTRE (or LUSTRUM), a term of five years.

LYCANTHROPY, an old term for a species of madness, in which human beings howled like wolves, and were even fabled to be changed into these animals.

LYDIAN, a soft and effeminate kind of music, so termed because such music was popular among the inhabitants of Lydia.

LYMPHATICS, vessels which absorb the watery fluids or lymph of the animal system, and convey it to the sanguineous circulation.

LYRICS, short verses, composed originally to be sung to the lyre.

MACARONIC, an epithet denoting verses of a burlesque kind, framed out of a jumble of different languages, or of Latin words Anglicized or modernized.

MACERATION, the process of softening or digesting bodies in fluids.

MACHIAVELISM, a word expressive of cunning and artifice. It is derived from the name of Machiaveli, a Florentine writer, whose real principles, nevertheless, were not such as to warrant the attachment of a disreputable meaning to a term founded on his name.

MAGNETISM, that branch of science which treats of the property of attracting or repelling iron, displayed by the magnet or loadstone.

MAGNETISM (ANIMAL), a phrase invented in consequence of a supposed action of the magnet on animal bodies. It is now applied to an imaginary influence of one animal body upon another, resembling that of the magnet in some degree.

MALARIA, an Italian term signifying "bad air," and applied to the fever resulting from it in certain marshy situations.

MALLEABLE, an epithet distinguishing such metals as are capable of extension by hammering.

MAMMALIA, a term derived from the Latin *mamma* (the breasts), and applied in zoology to that numerous class of animals which *suckle* their young. The adjectives *mammalian* and *mammiferous* (breast-bearing) are sometimes used to denote the members of this class.

MAMMOTH, a large extinct species of elephant found in a fossil state.

MANDIBLE, the term applied to the upper and under jaws of birds and insects.

MARANATHA, a word expressive of a curse, and generally coupled with *anathema*, bearing the same sense.

MARASMUS, a species of wasting illness, unmarked by any strong recognisable symptoms.

MASTODON, a large extinct animal resembling the elephant, and found in a fossil state.

MATHEMATICS, the science which takes cognisance of magnitude and number, or whatever may be measured or computed. (See articles GEOMETRY and ALGEBRA.)

MATRIX, a mould of any kind that forms or imbeds bodies.

MAXILLARY, of or belonging to the jaws.

MECHANICS, that branch of science which treats of moving forces, and their practical application to the making of tools, engines and machines.

MEDULLARY, an adjective derived from *medulla* (marrow), and used to indicate any substance such as that of the brain, resembling marrow in appearance and consistence.

MEGATHERIUM, a gigantic animal of the sloth tribe, now existing only in a fossil state.

MENSTRUUM, any medium in which bodies are dissolved.

MEPHITIC, a word designating foul or poisonous gases.

MERIDIAN, in geography a great circle passing through the poles and any given place on the earth, and exactly dividing it into two hemispheres, eastern and western. Meridians being entirely suppositious lines, it is necessary to fix arbitrarily on certain spots wherefrom to reckon longitudes, or the distances of places to the east or west. Greenwich is chosen for this purpose in Britain, Paris in France, and so on. In astronomy, meridian signifies a circle in the heavens directly above the terrestrial meridian.

MESENTERY, a thick membrane full of glands, lying among the intestines and connected with them.

METACARPUS, the skeleton of the palm, or that part of the hand between the wrist and fingers.

METALLURGY, the art of separating metals from their ores, and of assaying, refining, and working them.

METAMORPHOSIS, a transformation or changing of any thing into a new and different shape.

METAPHOR, the application of words in a figurative sense, or in one to which, in their ordinary signification, they cannot be put.

METAPHYSICS, that science which treats of the nature and properties of mind or spiritual existence.

METATARSUS, that part of the foot between the heel and toes.

METEMPSYCHOSIS, the doctrine of transmigration, which supposes that souls pass from body to body in succession, entering the lower animals as well as human beings.

METEOROLITES (ÆROLITES), solid mineral bodies varying in bulk, which fall from the atmosphere, and are by some deemed of lunar origin.

METEOROLOGY, the science which takes cognisance of meteors or luminous appearances in the atmosphere, of changes of weather, and of aërial phenomenon generally.

METONYMY, a rhetorical figure by which one thing is put for another, as the cause for the effect, a part for the whole, and the like.

MEZZOTINTO, a particular kind of engraving, resembling drawings in Indian ink, and effected by first roughening the plate of metal, and afterwards smoothing parts of it, less or more, till the figure is wrought in as desired.

MIASMA, a name applied to all noxious effluvia, whether arising from putrefying matter or from the presence of contagious disease.

MICROSCOPE, an optical instrument which magnifies objects, and seems to bring them nearer to the eye, by means of lenses properly placed.

MINERALOGY, that branch of science which treats of the structure, properties, and varieties of minerals.

MIRAGE, an optical illusion, consisting in the production of double images of objects by refraction, or the assumption of the appearance of sheets of water by tracts of desert sands.

MNEMONICS, the art of assisting the memory by artificial rules.

MOLAR, a word applied to and signifying the *grinder*-teeth.

MOLLUSCA, a great class of animals whose bodies are soft, and neither furnished with skeletons nor with articulated coverings; though some of them, as the snail, have shells attached to their system.

MOMENTUM, the impulse or quantity of motion in a moving body.

MONOLOGUE, a scenic speech uttered by one person.

MONOMANIA, madness upon one point or ruling idea.

MONOTHEISM, the doctrine of the belief in one God.

MOSAIC, a species of inlaid work, in which pieces of glass or marble, gems, and other articles, cut into squares, are arranged in cement, so as to imitate the effect of painting.

MUCILAGE, a solution of gum, or tenacious fluid extract of vegetable matters.

MUCUS, a viscous animal fluid, secreted in the body to moisten the *mucous* membrane, which is a continuation of the skin, carried into all passages of the body that communicate by openings with the external air.

MURIATIC ACID (commonly called *spirit of salt*), a strong acid composed of chlorine and hydrogen, which forms many salts, called *muriates*, with the alkalies and earths, of which muriate of soda (common sea-salt) is an example.

MUSCLE, the red fibrous portion (called *flesh*) of the animal frame, the contractility of which, exercised at the impulse of the will, is the direct source of all bodily motion, thence called *muscular*.

MYTHOLOGY, the term applied to the history of the fabulous gods and demigods of Greece and Rome.

NARCOTICS, a class of medicines which allay pain by producing a stupifying effect on the nervous system.

NAUSCOPY, the art of discovering the approach of vessels not in sight, or detecting land from sea in the same way.

NEBULÆ, in astronomy, certain spots in the heavens, now understood to be clusters of stars, and some of them seeming to be systems in course of formation.

NECROLOGY, a biographical register of deaths.

NECROPOLIS, literally, "the city of the dead," a name bestowed on cemeteries.

NECTARY, that part of the corolla of flowers in which the honey-dew is accumulated.

NEOPHYTE, a new convert or proselyte to any doctrine.

NERVOUS, of or pertaining to the nerves, the organs of sensation and volition. A nervous temperament, properly speaking, is one in which the nerves are peculiarly sensitive, though the term nervous is often misapplied in the sense of strong or muscular.

NEUTRAL, a term bestowed on salts compounded of acids and metallic oxides, in which the properties of the constituents are neutralized or changed.

NICOTIAN, the scientific epithet for the tobacco-weed.

NITRATES, those salts which are formed of nitric acid (*aqua fortis*) and various oxides.

NITROGEN, an elementary gas, the principal ingredient in atmospheric air, and which, in a pure state, destroys life and extinguishes flame. Besides the air, it forms with oxygen various other compounds, of which one, the nitrous-oxide gas, is well known, and is named the *laughing gas*, from its exhilarating qualities.

NODE, in surgery, a hard tumour on the bones.

NOMADE or NOMADIC, an epithet denoting and applied to pastoral tribes that lead a wandering life.

NONES, the seventh days of the months of March, May, July, and October, and the fifth of the others.

NUCLEUS, the kernel of a nut; a term given to any originating centre around which other things accumulate.

NUMISMATICS, the science which has for its object the study of coins and medals.

NUNCUPATIVE, a term applied particularly to testamentary acts expressed verbally, and not, primarily at least, put into writing.

NUTATION, a tremulous motion of the earth's axis, inclining it to the ecliptic, twice a year.

OBLATE, a term of geometry applied to such flattened figures as that of the earth, in which the diameter at the poles is lesser than that at the equator.

OBSERVATORY, a building suitably placed and fitted up for astronomical observations.

OCCIPITAL, of or pertaining to the *occiput*, or back part of the skull.

OCCULTATION, the obscuration of any celestial body by the intervention of another.

OCTAGON, a figure of eight sides and angles.

OCTAVO, a name given to a sheet of eight leaves or sixteen pages, or to books so divided into sheets.

ODE, a lyrical poem, generally divided into parts, regular or irregular, and conveying an outburst of vivid feeling. Odes have been written, however, in numberless forms.

ODONTALGIA, the toothache.

ŒDEMATEUS, an epithet for a watery swelling of a soft kind, which dimples or *pits* on pressure.

ŒSOPHAGUS, the passage of the gullet.

OFFICINAL, a term given to such medicines as are directed by authority to be kept by druggists.

OLFACTORY (smell-giving), the epithet designating the nerves of the nose.

OLIGARCHY, a form of government where power is in the hands of a few.

OMEGA, the last letter of the Greek alphabet.

ONTOLOGY, the science or doctrine of Being.

OPHTHALMIA, inflammation of the outer covering of the eyeball and eyelids.

OPODELDOC, a solution of soap and camphor in spirit of wine, used as a liniment.

OPTICS, the science which takes cognisance of the phenomena of light and vision.

OPTIMISM, the doctrine which holds all to be for the best in the system of things.

ORATORIO, an elevated species of musical composition, expressive of tender and sublime feeling.

ORGANIC, an epithet used to contradistinguish the animal and vegetable kingdoms from the mineral, being applied to every thing which possesses or has possessed organs.

ORGANOLOGY, the science which treats of organs, a term sometimes applied to that branch of phrenology which has reference to the divisions of the mental faculties.

ORNITHOLOGY, that branch of natural history having reference to birds.

ORRERY, a machine for representing on a small scale the motions of the heavenly bodies.

ORTHOEPY, the art of correctly pronouncing words.

ORTHOGRAPHY, that branch of grammar which teaches the art of accurate spelling.

OSCILLATION, the motion of a body suspended at right angles, as in the case of a pendulum.

OSSIFICATION, the making of bone, or conversion of other animal matters into bone.

OSTEOLOGY, that branch of anatomy which treats of the skeleton.

OSTRACISM, banishment by the popular voice, done in Greece by writing names on shells, as the word implies.

OTTOMAN, an epithet synonymous with Turkish, derived from an early chief named Othman

OVATION, a triumph or triumphal procession.

OVERTURE, in musical language, the prelude to an opera, composed in such a style as to prepare the auditors for what is to follow.

OVIDUCT, a duct for the passage of eggs.

OXALIC, the name of a vegetable acid of a strongly poisonous character.

OXYGEN, an uncompounded gas, the most extensively prevalent and most important element in nature. It is one of the two gases which form water, and one of the two which compose the atmospheric air. It is essential to animal vitality, being absorbed into the blood by respiration; and it is the great supporter of combustion. It forms compounds (called *oxides* or *oxydes*) of all kinds —gaseous, fluid, and solid—and is found in the material world, in short, in unnumbered shapes.

PACHYDERMATOUS, a term signifying thick-skinned, and applied to a large class of animals, of which the horse, pig, and elephant are specimens.

PALÆSTRA, one of the titles for the gymnastic schools of antiquity.

PALATINE, a term applied, in one sense, to certain English counties which have or had *separate jurisdictions*.

PALINODE, a recantation in verse, or amend made for any injurious charge.

PALMATED, resembling the palm of the hand in shape.

PALMISTRY, fortune-telling by the lines of the hand.

PANORAMA, a name given to the exhibition of a large painting, arranged circularly, so that, from a central point, the spectator commands an equal and complete view of the whole at once.

PANTHEISM, a word commonly applied to that religious theory which holds that deity is universally present, forming and existing in all living things.

PANTHEON, a heathen temple dedicated to all the gods.

PANTOMIME, a scenic representation wholly composed of mimicry.

PARABOLA, a curve formed by cutting a cone by a plane parallel to one of its sides.

PARACHUTE, a large umbrella-shaped machine, by means of which persons have descended from balloons.

PARADOX, a truth adverse to facts in seeming.

PARALLAX, a change in the apparent place of any heavenly body, when viewed from different places.

PARALLELOGRAM, the proper term for the four-sided figure vulgarly called an oblong square.

PARASITICAL, a term derived from *parasite*, a fawning hanger on, and given, in natural history, to certain animals and plants always found attached to others, or dependent more or less upon them.

PARIAS, a degraded Hindoo caste or tribe.

PARK, a piece of enclosed ground, for the legal constitution of which three things were formerly necessary —a royal license, enclosure by some species of fence, and the presence of beasts of chase. Such regulations, of course, are not now enforced.

PARODY, a kind of imitative composition, in which sublime or serious writing is, by slight changes, burlesqued.

PASQUIN, the name of a witty cobbler of Rome, applied after his death to a statue on which it became common to paste satirical verses, whence the use of the word *pasquinade*, to signify a lampoon.

PASTORAL, a poem relating to shepherd-life.

PATELLA, the knee-pan, or small bone in front of the knee-joint.

PATHOLOGY, that branch of medical science which treats of the signs and tokens of disease, external and internal.

PELLICLE, any very thin membrane, such as that found inside an egg-shell.

PENITENTIARY, a title given to prisons formed upon a new plan, where convicts are employed in regular labours.

PENTAMETER, a form of line in Greek and Latin poetry, consisting of four feet (of two and three syllables each) and two cæsuras or monosyllables. Elegiac verse, in the classical writings, is composed of a hexameter alternating with a pentameter.

PERICARDIUM, the membrane enclosing the heart.

PERIURANIUM, the membrane enclosing the skull

PERIHELION, in astronomy, that point of the orbit of any planet at which it is nearest to the sun.

PERIOSTEUM, the membrane covering the bones.

PERIPHERY, the circumference of any curvilinear figure.

PERIPHRASIS, a circumlocutory form of expression.

PERISTALTIC, the epithet assigned to the regular serpentine movement which takes place in the intestines.

PERITONÆUM, the membrane encircling the intestines.

PERORATION, the winding up of an oration.

PETAL, in botany, a flower-leaf.

PETRIFACTION, signifying conversion into stone, and applied to animal and vegetable bodies so changed by long exposure to impregnation from earthy substances.

PHANTASMAGORIA, an optical exhibition resembling that of the magic lantern.

PHARMACEUTICS, a title for the science of *pharmacy*, which takes cognisance of the preparation of drugs for medical purposes.

PHARMACOPŒIA, a dispensatory, or work which directs the preparation of drugs.

PHARYNX, the muscular cavity at the back of the mouth, leading into the gullet.

PHENOMENON, a word signifying "an appearance," and familiarly used in an extended sense, being applied to any remarkable thing discoverable by observation or experiment, whether common or uncommon in occurrence.

PHILANTHROPY, literally, "love of mankind."

PHILOLOGY, that department of literature which involves the consideration of words and languages, their origin, structure, and significations.

PHILOSOPHY, the "love of wisdom or knowledge."

PHLEBOTOMY, bleeding or opening a vein.

PHONICS, a title for the science of sounds.

PHOSPHORESCENCE, a luminousness emitted by certain bodies, animal and vegetable, and unaccompanied by heat. The light of the glow-worm exemplifies the meaning of the term, which is derived from

PHOSPHORUS, a simple body, yellowish and solid like wax, and which emits light at common temperatures without much heat. It enters into bones, and forms a variety of compounds in nature.

PHOTOGENIC, a term invented for the new mode of "drawing by means of light," where, upon a surface rendered peculiarly sensitive by certain preparations, the rays of light impress perfect images of external objects.

PHRENOLOGY, a science which holds the intellectual and moral character of men to be determined and recognisable by the magnitude and figure of the skull.

PHYLACTERY, a spell or charm of any kind.

PHYSICS, a science of vast extent, which explains the doctrine of natural bodies, and all the phenomena connected with them.

PHYSIOGNOMY, the study of men's characters, as indicated by the external features of the face.

PHYSIOLOGY, a term confined to that branch of physics which treats of the functions and properties of living bodies, animal and vegetable.

PIA-MATER, the inner tunic which dips into and lines all the folds of the brain.

PLAGIARY, a literary person who pilfers from the works of others.

PLANISPHERE, a sphere laid down on a plain surface, as in the case of maps of the world and the heavens.

PLASTIC, a word applied to substances, such as clay, capable of being moulded into any desired shape, as well as to the art of so moulding them.

PLEONASM, the use of a redundancy of words to express an idea, as "I heard it with my own ears."

PLETHORA, a condition of the body in which the vessels are surcharged with blood.

PLEURISY, inflammation of the pleura or membranous covering of the lungs.

PNEUMATICS, the science which treats of the mechanical properties of air and other compressible aëriform fluids.

PNEUMONIA, inflammation of the lungs.

POLARITY, the property of pointing to the poles, a word used in reference to mineral bodies when they attract one pole of the magnet and repel another.

POLARIZATION OF LIGHT, a changed state of light, in which it exhibits the property of polarity, when acted on by certain mediums.

POLE, in magnetic science, the two points of a magnet which correspond and point the poles of the world, north and south.

POLEMICS, controversial writings on theology.

POLLEN, the fructifying powder or farina of plants.

POLYGAMY, a plurality of wives or husbands.

POLYGLOT, a book written in various languages.

POLYPE, living creatures, remarkable for their soft texture, and tendency to reproduce parts cut from their bodies.

POLYTECHNIC, a word applied to institutions where many sciences are taught, or to scientific exhibitions of a varied description.

POLYTHEISM, the belief in many gods.

PORPHYRY, a compound rock, granular and crystalline, and susceptible of a fine polish.

PORTE (the *Sublime* or *Ottoman*), a title for the Turkish sovereignty, derived from the fameus gate (*porta*) of the sultan's palace at Constantinople.

POSITIVE, a term used in connection with electricity, to indicate its presence in bodies in a quantity greater than natural. Negative electricity is a phrase expressive of the opposite condition.

POSTULATE, a point "demanded" as fundamental in any demonstration.

PRÆNOMEN, a name prefixed to the family name.

PRATIQUE, a license to crews to trade after performing quarantine or proving health.

PRAIRIE, the grassy plains in North America

PRECIPITATE, the chemical term for matters precipitated from solutions by change of affinity.

PRIMÆ VIÆ, the alimentary canal in animals.

PRISM, in optics, a triangular glass body used for separating rays of light into their primitive colours.

PROGNOSIS, the art of foretelling the issue of maladies from their symptoms.

PROLOGUE, an address prefixed to dramatic compositions.

PROPAGANDISM, a term commonly given to the system of propagating political doctrines, and originally derived from the court of the propaganda at Rome for disseminating the papal faith. The secret revolutionary societies of France also took the name of propaganda.

PROPOLIS, a resin gathered from trees, and used in the architecture of the bee tribe.

PROSCENIUM, the front of the stage in the theatres of Greece and Rome.

PROSODY, the part of grammar which treats of the quantities and accents of words, and of the rules of versification.

PROTOCOL, the first draught of a diplomatic agreement or treaty.

PSYCHOLOGY, the doctrine of the nature and properties of the soul.

PULMONARY, of or pertaining to the lungs.

PUNDIT, a learned Brahmin, or one versed in Hindoo learning.

PUPA, the chrysalis state of the insect, or that intermediate between the worm and the insect.

PYLORUS, the orifice by which the stomach communicates with the intestines.

PYROLIGNEOUS, an epithet for acetic acid, or vinegar produced from wood.

PYROTECHNY, the art of arranging fire-works.

QUADRATURE (of the CIRCLE), a problem in geometry long undetermined, of which the object is to find a right-lined figure equal to the area of any given circle.

QUARANTINE, denoting the period of restraint, formerly forty (*quaranta*) days, to which ships' crews are subjected when infection is presumed to be among them.

QUARTAN, a fever or ague, of which the paroxysm recurs every fourth day.

QUARTO, a term for that size of books formed by dividing a sheet into four leaves.

QUARTZ, a species of stone, often found in pure white crystalline masses, and sometimes endowed with various tints by other minerals, as in the case of amethyst, which is a purple quartz.

QUININE, a bitter alkaline body, extracted from Peruvian bark, and much used as a tonic in the form of sulphate.

QUOTIDIAN, an intermittent fever, of which the fit occurs once every day.

RADIAL and RADIATED, adjectives applied to bodies of a figure resembling in whole or in part a cart-wheel, of which each spoke is a *radius* or ray, such being the name given to lines passing from the centre to the circumference of every circle.

RADIX, a root.

RAMADAN, a solemn fast kept by the Mohammedans during the ninth month of the Arabic year, and lasting, each day, from dawn till sunset.

RATIO, the proportion of one thing in regard to any other thing.

REBUS, properly a species of riddle, in which some name or word is represented by figures or pictures.

RECIPE, a receipt or prescription.

RECITATIVE, a kind of musical composition, in which the accentuations of common speech are imitated.

RECTANGLE, a right angle or angle formed by two sides which are perpendicular to one another.

RECTUM, the terminating section of the intestines.

REGATTA, a word adapted from the Italian, and applied to boat or yacht races.

REGIMEN, a regulated course of diet in medical language.

RELIEVO (or RELIEF), a word applied to that mode of sculpture or carving in which figures are raised more or less from the surface.

RETINA, an expansion of the optic nerve, on which external images are cast, and through which ocular perception is effected, the other parts of the eye being strictly mechanical.

RHETORIC, the art of speaking with propriety, elegance, and force.

RHOMBOID, a four-sided figure of which the opposite sides and angles are equal, but which is neither equal-sided nor right-angled.

RHOMBUS or(RHOMB), a four-sided figure with equal sides, but not right-angled ; for example, a card-diamond.

RHYTHM, the measured division of time in music, or in verses of poetry.

RIPACCIMENTO, a word from the Italian, signifying something dressed up anew.

RONDEAU, a short species of poem with few rhymes, in which the sense of the opening lines is repeated, or nearly so, at the close.

ROSICRUSIANS, a sect of mysticists of the middle ages, who called themselves Brethren of the Rosy Cross, and prosecuted in secret the search for the philosopher's stone and the elixir of life.

ROUND-ROBIN, a mode of addressing or petitioning, in which, to prevent any subscriber from seeming more forward than another, the names are arranged in a circle.

RUNIC, the title of the characters forming the language of the ancient Scandinavians or northern Goths.

SABBATICAL, an epithet given to every seventh year in the Jewish economy, because they then allowed their fields to rest without tillage, and gave external nature a long Sabbath

SACCHARINE, of or pertaining to sugar.

SACRUM, the small terminating bone of the back-bone

SALIQUE, the title of the old law of France, which excluded females from the throne.

SALIVATION, an increased flow of saliva from the glands of the mouth, caused by medicines.

SANHEDRIM, a word signifying the great public council, civil and religious, of the Jews.

SANSCRIT, the old or dead tongue of Hindostan, in which much valuable learning is contained.

SAPPHIC, a species of verse among the Greeks and Romans, consisting of four lines, and named from Sappho.

SARCOPHAGUS, a word applied to tombs, and derived from the body-consuming effects of a species of limestone which was anciently used for making coffins.

SCAPULA, the shoulder-blade.

SCARABÆUS, the beetle.

SCROFULA, a disease consisting in hard tumours of the glands, chiefly of the neck.

SENSORIUM, the brain or centre of nervous energy, including sensation and volition.

SEPTIC, any thing that promotes putrefaction. *Antiseptic* signifies any thing that checks it.

SEPTUAGINT, a Greek version of the Old Testament, named from its being executed by seventy (*septuaginta*) Jews, or perhaps seventy-two.

SERRATE(or SERRATED),something notched like a saw.

SERUM, a very thin and transparent fluid, which lubricates those surfaces in the interior of the body which do not communicate with the external air.

SETON, an issue on the body formed by the insertion of a cord.

SIDEREAL, of or pertaining to the stars.

SIENITE, a compound, granular, grayish-tinted rock, named from Siene in Upper Egypt.

SIERRA, a Spanish name for an eminence or chain of hills.

SILICA (or SILEX), a primitive earth, the main constituent in all stones and rocks whatsoever.

SINAPISM, a mustard poultice.

SIPHON, in hydraulics, a tube from which the air is extracted for the purpose of raising fluids, by the atmospherical pressure behind, above the level of the reservoir.

SMELTING, the art of fusing ores for the extraction of the metallic parts from the refuse.

SOLECISM, in grammar, a violation in one way or another of the rules of the art.

SOLSTICE, the term given to the two periods at which the sun enters the tropics of Cancer and Capricorn, which is respectively on June 21st, and December 21st.

SOMNAMBULISM, a word denoting the act or phenomenon of sleep-walking.

SOPHISM, a false species of reasoning, not supported by the premises. *Sophistry* is the art or practice of using sophisms.

SOPORIFIC, an epithet for any thing inducing sleep.

SOPRANO, in music, a term applied to a species of treble, suited to the female voice.

SPECIFIC, in medical language, a remedy which cures any special disorder with more or less common certainty.

SPECTRUM, a bright spot formed by admitted light on any surface, or the image of an object seen after the eye is withdrawn from it.

SPECULUM, in optics, a polished body impervious to light, or which reflects it.

SPHEROID, a body nearly approaching a sphere in shape.

SPONDEE, a poetic foot, or division of a line, consisting of two long syllables.

SPORADIC, an epithet opposed in sense to epidemic, and meaning diseases which are neither general nor contagious

STALACTITE, a name for the concretions formed of carbonate of lime, which accumulate in consequence of the drippings from the roofs of caverns.

STAMEN, the male organ of fructification in plants

STANZA, a word now used to designate every portion of a poem united by rhymes.

STATICS, that department of mathematics which has reference to bodies at rest.

STATISTICS, a science of a comprehensive order, embracing every thing connected with the population of a country, their condition and employments.

STEARINE, the solid constituent of oils and tallow.

STENOGRAPHY, the art of writing in short-hand.

STEREOTYPE, a solid plate of metal, cast from a preparation of stucco, and receiving from it an impression of drawings or letter-press, previously communicated by common gravings or types. The art of stereotyping is now of great use in giving to publishers permanent impressions of their works.

STERTOR, a noisy kind of breathing, following affections of the brain.

STETHOSCOPE, a tubular instrument, by applying the ear to which internal diseases of the chest or abdomen are discovered.

STIGMA, in botany, the top of the pistil into which the pollen is received.

STRABISMUS, in technical language, a squint.

STRATIFICATION, the process by which any portions of the earth have been arranged in layers or beds, called *strata*. Generally speaking, all stratified rocks have been subjected to the influence of water, while unstratified rocks are more or less volcanic in their origin.

STRIATED, streaked or marked with lines.

STROPHE, the first division of a Greek ode, succeeded by the *antistrophe*.

STRUMOUS, an epithet applied to glandular tumours.

STYLITES, fanatics who lived on pillars.

STYPTICS, medicines which check bleeding.

SUBLIMATION, the process of volatilizing or distilling a dry substance by heat.

SUBSTRATUM, any substance that underlies another substance.

SUCCEDANEUM, any thing which serves as a substitute.

SUDORIFICS, medicines which promote perspiration.

SULPHURIC, the title of a well-known acid (oil of vitriol), which is composed of sulphur and oxygen, and forms many salts called *sulphates*, of great importance in nature.

SUPPURATION, the generation of *pus*, a thick diseased secretion, of yellowish hue.

SYLLOGISM, an argument consisting of three parts, called the major, minor, and the conclusion, and which bear a relative sense, such as is exemplified in the following case:—"Every madman should be confined: A. B. is a madman, therefore A. B. should be confined." All accurate reasoning is syllogistic.

SYMPOSION, a social entertainment among the ancients.

SYNCHRONISM, a word expressing the simultaneous occurrence of two events.

SYNCOPE, a faint or swoon.

SYNONYM, a word having the same meaning with another.

TABLEAUX (VIVANTS), a term applied to groups of persons, arranged scenically, and so dressed as to represent the actors in some famous historical incident, or the scene of some noted painting.

TALC, an earthy stone, usually of greenish tint, and found in lustrous layers or plates of a soft or unctuous feel.

TALMUD, the book of the oral law of the Jews, of great antiquity, and containing many of their traditions.

TANGENT, in geometry, a line which touches a curve, but does not cut it.

TANNIN, the principle in galls, oak-bark, and other substances, upon which their astringent qualities depends.

TARANTULA, a name given to a large spider, the bite of which, long held to be venemous, was deemed curable by music alone.

TARIFF, a table of the customs or duties chargeable upon goods.

TARSUS, the bones of the foot immediately adjoining the heel.

TAUTOLOGY, the needless repetition of the same words or ideas in speech or writing.

TECHNOLOGY, a treatise on the arts; a word derived from *techne* (art), and *logos* (a discourse). The epithet *technical*, denoting something belonging to art, is from the same source.

TELEGRAPH, a word signifying "writing to or for a distant point, and applied to the various inventions by which news is communicated between distant spots by flags or other means."

TELESCOPE, a term signifying and applied to an instrument through which distant objects are viewed.

TENTACLES (TENTACULA), the organs of feeling, prehension, and motion, in various insects and other animals, and sometimes viewed also as organs of hearing.

TERMINOLOGY, that branch of philological science which explains the sense of terms of art.

TERRA-COTTA, an Italian word signifying baked clay, and applied to a class of relics of art, such as vases and the like, formed from that substance, and found in considerable quantities in Tuscany.

TERTIAN, an ague of which there are two paroxysms every three days.

TERTIARY, a term used to denote the later formations in the earth's crust, comprehending the superficial alluvial deposits, and such as are composed chiefly of sand and clay.

TESTACEOUS, a word given to animals which have a strong thick shell, such as oysters, and are included in an order called by the general name of *testacea*.

TESTUDO, the tortoise tribe of animals.

TETANUS, a word usually applied to *locked-jaw* by medical men.

THEISM, the doctrine of the existence of a God, opposed directly in sense to *atheism*.

THEOLOGY, literally, a discourse on divinity, and commonly denoting the study or science of religion.

THEOREM, a speculative proposition deduced from several definitions compared together.

THERAPEUTICS, a term applied to the study of the symptoms of disease and its remedies, and denoting, in short, the healing art generally.

THERMAL, an epithet equivalent to *warm* or *tepid*, and usually assigned to mineral waters so characterized.

THERMOMETER, an instrument for *measuring heat* by means of a graduated scale of degrees.

THESIS, a theme or proposition advanced and maintained by illustration and argument.

THORACIC, of or pertaining to the *thorax* or chest.

TONICS, medicines which increase or restore the healthy tone of the coats of the stomach and muscles generally.

TOPOGRAPHY, a description of places, or minute branch of geographical science.

TORNADO, a whirlwind.

TORSO, the trunk of a statue deprived of head and limbs.

TOURNIQUET, a surgical instrument for repressing the flow of blood.

TOXICOLOGY, a treatise on poisons, or the science which takes cognisance of them.

TRANSCENDENTAL, the philosophy of pure or speculative reason, which occupies itself not so much with objects as with the way of knowing them.

TRANSITION, the term applied to those parts of the earth's crust supposed to have been arranged when the earth was passing from the uninhabitable to the habitable state.

TRANSUBSTANTIATION, the conversion of the sacramental bread and wine into the body and blood of the Saviour, held by Roman Catholics to take place in reality.

TRAP, a dark semi-volcanic rock, usually found in a columnar form, or arranged in successive layers like stepping-stones.

TRAPEZIUM, a geometrical figure having four unequal sides.

TRAVESTIE, a burlesque imitation of grave writing.

TREPANNING, in surgery, an operation by which the skull is perforated in order to raise a depressed portion.

TRIGONOMETRY, the art of measuring the sides and angles of triangles.

TROCHEE, a poetical foot of two syllables, one long and the other short.

TUBERCLES, in anatomy, small round suppurative tumours, such as those affecting the lungs in consumptive disease; the adjectives *tubercular*, *tuberose*, and *tuberous*, are applied, in medical and botanical language, to denote the presence of knobs or growths so shaped.

TUBULAR, having the form of a tube.

TUMULUS, a barrow or mound of earth or stones formerly erected over the dead.

TUNICATED, covered with one or more tunics or coverings.

TURBINATED, in conchology, a term applied to any shell wreathed serpentinely from a broad base to a narrowed apex.

TURBINITE, a fossil turbinated shell.

TUSCAN (ORDER), an ancient, massive, and simple style of architecture.

TYMPANY, flatulent distension of the abdominal region.

TYMPANUM, the drum of the ear, or partition dividing the outer from the inner parts of the organ of hearing.

TYPHUS, a dangerous species of continued fever of a contagious nature, and marked by a tendency in the system to putrefaction.

TYPOGRAPHY, literally, "writing with types," or the art of printing.

ULTRAMONTANE, signifying "beyond the mountains."

UMBILICAL, of or pertaining to the navel.

UNCIAL, an epithet for writing in which large characters are used.

UNGUICULATE, provided with claws or nails.

UNIVALVE, a shell of one piece.

URANOLOGY, a discourse on the heavens.

URANUS, the planet Herschel or Georgium Sidus.

UTILITARIAN, an epithet first applied to the followers of Jeremy Bentham, or those who estimate all things by their degree of usefulness in promoting "the greatest happiness of the greatest number."

UVULA, a small dependent body at the back of the mouth, familiarly called the pap of the throat, and useful as a sort of defence to the tops of the windpipe and gullet.

VACCINATION, the operation of introducing cow-pox matter into the human body, in order, by producing a greatly mitigated disease, to preserve the system against natural small-pox, which rarely occurs twice in one person. From noticing that cow-milkers were strangely free from liability to small-pox, Dr. Jenner discovered the invaluable secret that certain pustules on the udders of cows possessed the property described.

VACUUM, a space named as being void or vacant, but always containing, in reality, some amount of highly rarefied air even under the most powerful air-pump.

VARICOSE, an epithet for veins distended in an uneven or knotted manner.

VASCULAR, provided with or pertaining to vessels.

VATICAN, the title of a palace built on a hill of the same name at Rome, and containing the magnificent library collected by successive popes.

VELOCIPEDE, a wheeled machine so constructed that a man, while seated on a sort of saddle, can propel the wheels by pressing on the ground, or acting on the wheels themselves. Velocipedes have as yet been objects of curiosity merely, not of utility.

VENTILATION, free introduction of air into any place.

VENTRICLES, a name given to cavities in the heart and brain.

VENTRILOQUISM, a word signifying "speech from the stomach," and erroneously used to denote the art by which the voice is made to appear as if it *came from different places*—an art dependent on skilful management of the voice in the windpipe, and other necessary means of illusion. Ventriloquism, in short, seems to consist simply in a vocal mimicry of a very perfect kind.

VERMICULAR, of or belonging to worms, called the *vermes* in the Linnæan classification.

VERMIFORM, shaped like worms.

VERTEBRÆ, the twenty-four strong and united bones which form the spine or vertebral column, and sustain the trunk and head.

VERTEX, the top or summit of any thing; whence the adjective vertical, applied commonly to any thing placed or rising directly upwards in the air or heavens.

VIADUCT, a carriage-way, raised or arched over any hollow or low-lying spot.

VILLOUS, covered with down or soft hairs.

VIRUS, poisonous or corrosive matter.

VISCUS, an organ in medical science.

VITREOUS, a term signifying *glassy*, and applied to the soft pellucid humour filling the fore-parts of the eye.

VITRIFACTION, conversion into glass.

VIVIPAROUS, a term applied to animals which bring forth living young, as opposed to egg-bearing creatures.

VOLCANO, in geology, a burning mountain or eminence from which ignited and melted matters are cast forth. Volcanoes have evidently been instrumental in moulding a great proportion of the existing crust of the globe. Traces of them, in an extinct state, are noticed almost everywhere.

VOLTAIC PILE, the upright series of alternate zinc and silver plates, which the chemist Volta formed, as a mode of developing the galvanic power, after its discovery by Galvani. The pile is now disused, the galvanic trough being substituted for it, as more useful and convenient.

VORTEX, the centre of a whirlwind or whirlpool, or of any body or bodies in rapid circular commotion.

VULCANIC, the title sometimes given to the theory of Dr. Hutton, which ascribes almost all geological phenomena to subterranean fire.

WERNERIAN, a name for the aqueous theory of the earth, or that which regards water as the chief geological agent, derived from the German philosopher Werner.

WRANGLER, a term applied to the successful competitors for degrees in the English universities, particularly in mathematical contests.

ZENITH, that point in the heavens which is directly above or vertical to the spectator, or to any given spot of the earth.

ZERO, the point of the thermometer from which it is graduated, or the numbers are begun. Fahrenheit's zero is thirty degrees below the freezing point of water.

ZODIAC, an imaginary belt or broad circular space in the heavens, within which the whole of the planets make their revolutions. It is divided into twelve parts of 30 degrees each, called the Signs of the Zodiac, and named respectively from the constellations which were observed to pass them.

ZOOLOGY, the science which treats of the structure, character, and varieties of animals or living creatures.

ZOOPHYTES, a class of remarkable animals, of which sponges and corallines are specimens, and which resemble plants, having stems more or less calcareous and in which many of the animals are congregated together.

THE STEAM-ENGINE.

The apparatus which, after numerous improvements by Watt and others,* has assumed its complete form of a *Steam-Engine*, and has been universally adopted as a convenient and economical means of impelling machinery, is dependent on the properties of water and heat for its source of power, and an account of these seems an indispensable preliminary to any description of its character. We shall, therefore, in the present sheet of popular information, begin by giving, first, a history of the properties of water, with the general nature of aërial bodies; embracing an account of the different kinds of fuel which are employed to convert the water into steam: and then proceed to a detailed account of the various parts which enter into the formation or construction of the engine, taken in the widest sense of the word, and the mode in which these are arranged so as to obtain the maximum of power, including the different kinds of engines adapted to navigation, railroads, &c. The whole to conclude with an historical sketch of the invention, from the earliest period, until its almost final perfection in the hands of Watt.

Watt.

WATER.

The matter of which the external world is composed presents itself to our notice in three palpable forms or conditions, namely, the *solid*, the *liquid*, the *aëriform*. Stones or pieces of metal belong to the first kind; water and quicksilver are instances of the second; in the air, and in gases, such as carbonic acid gas, we find examples of the third. But all the different kinds of matter, whether simple or compound, are not specially found *only* under one or other of these forms; for it may be truly said, that the solid, the fluid, or the aëriform condition, is merely contingent, that is, depending on certain circumstances besides the inherent nature of the particles of matter of which each body individually is composed. Hence it is that the same kind of matter may, on changing those conditions referred to, assume first the solid form, then the fluid, and finally the aërial state; or, conversely, being in the aërial state, it may be rendered fluid, and lastly become solid.

The law applies to bodies whether they are simple or compound, and is beautifully seen in the different forms which water assume when exposed to a varied range of temperature. For, below 32 degrees of Fahrenheit, it is solid (*ice*); between 33 and 212 degrees, it is fluid (*water*); and above 212 degrees, it is in the form of vapour (*steam*); changes in its physical form, immediately related to and connected with changes in the amount of heat with which it has been supplied.

Water, which forms the grand agent in the steam-engine, is not a simple or elementary body, but consists of two distinct kinds of matter, the natural condition of which, when free under the ordinary circumstances of our globe, is that of an aërial substance. These two distinct matters, or substances, are oxygen and hydrogen; combined together in the proportion of one by bulk of the former, with two by bulk of the latter, they constitute the compound *water*, which had been, until nearly the close of the last century, considered as an elementary body. But water, as it is found in nature, though it is essentially composed of the matters now mentioned, does not consist solely of these, inasmuch as whether it be taken from springs, from lakes, from the sea, from rivers, from melted snow or ice, or from rain, or from any other source, it contains many other substances held in solution, and which affect its character very much—rendering it, indeed, often totally unfit for those purposes to which it is usually applied. When devoid of these substances, the water is considered by chemists as *pure*.

The substances which are dissolved by the water, and which render it impure, are of two distinct kinds—solid matters, such as lime, magnesia, and iron; gaseous matters, such as the elements of the air, oxygen and nitrogen, and carbonic acid. The proportion of solid matter varies considerably. In the waters of the sea which surround our shores, the amount of solid matter is estimated at nearly about 3½ per cent. Again, in river water, the proportion of solid matter is considerably less than that found in the sea.

The quantity of gaseous matter varies, but not so much as that of the solid matter. In rain water, there is usually noticed 2½ per cent. of atmospheric air, but in which the usual proportion between the oxygen and nitrogen is not preserved, as there is 32 of oxygen out of the 100, the remainder being nitrogen, whereas 21 is the proportion of oxygen in atmospheric air. Carbonic acid gas also is found in water.

On boiling the water, these gaseous bodies are set at liberty, and pass off as gases. Also the solid substances, such as the compounds of lime, are deposited, and form thick incrustations on the boiler, which requires to be removed, otherwise it would be rendered totally useless.

It is only the pure matter of oxygen and hydrogen—the actual water, as it may be termed—which is required in the working of the steam-engine; the other substances, whether aëriform matter or the solid particles held in solution, being not only useless, but even injurious. It will be seen that there are particular contrivances devised in the structure of the steam-engine to remove these.

Water is a fluid at ordinary temperatures, but may become *solid* on the one hand, or *aëriform* on the other by changes in the amount of caloric (heat) with which it is supplied. These two remarkable changes in the condition of water occur at specific temperatures; it becomes solid when the degree of temperature indicated by the thermometer of Fahrenheit is 32 degrees, and passes off in the state of vapour or steam when the same thermometer indicates the temperature to be 212 degrees. On the fluid being cooled down to 32 degrees, it becomes ice, the temperature 32 degrees being named the freezing point of water.

When the temperature is increased, so that the thermometer indicates 212 degrees, the water becomes steam

*James Watt, whose discoveries entitle him to be called the inventor of the steam-engine, was born at Greenock, in Scotland, January 19, 1736. At fourteen years of age he removed to Glasgow, and there, while afterwards acting as mathematical instrument-maker, he began those great improvements on the steam-engine which were completed in future years. Watt died on the 25th of August, 1819.

or vapour, assuming that condition in which its elastic force is applied to act as a moving power.

On the water passing off in this new form or condition, two very remarkable phenomena take place, namely, the fluid expands to a very great extent, the vapour occupying nearly 1700 times the space which the fluid occupied from which it was generated; and at the same moment, an immense quantity of caloric or heat enters into the water while becoming steam, and disappears; which heat, from the circumstance that it cannot be discovered by the thermometer, is usually called *latent* heat, in contradistinction to that which affects the thermometer, and which is accordingly named *sensible* heat, that is, heat whose effects are apparent in producing the movement of the fluid in the thermometer tube.

When the water has assumed the state of vapour, it is invisible, being as perfectly transparent as the atmospheric air; and in this form it becomes obedient to those laws which affect gaseous or aëriform bodies, supposing always that the usual increased temperature is maintained (212 degrees Fahrenheit) to preserve it in this new state; for, on withdrawing the caloric, it then returns to its liquid inelastic condition, which is termed condensation. This elastic state of the vapour may be suddenly destroyed by bringing it in contact with a large quantity of cold water—a process essentially a part of the greater number of steam-engines.

In this state of vapour the temperature is 212 degrees, or the same as that of the water from which it is generated. This may be easily determined by placing a thermometer in the boiling water, and then in the steam which arises from it.

Under the usual conditions in which water is made to boil, as in an open vessel on the fire, the temperature indicated by the thermometer is commonly about 212 degrees, the water acquiring at that temperature sufficient elastic force to overcome the weight of the atmosphere. But it is to be observed, that the pressure of the air must tend to retard the water swelling out into vapour; it will follow, therefore, that if we reduce the pressure on the surface of the water, the escape into the state of vapour will take place at a lower temperature, as was first observed by Dr. Cullen, and subsequently more minutely detailed by the late Professor Robinson. The latter has, indeed, established the general proposition, that vapours are produced from fluids *in vacuo* (where all atmospheric pressure is removed) at 140 degrees of Fahrenheit below the temperature at which these fluids naturally pass into vapour, under the usual pressure of the air. Water, for instance, which usually boils at 212 degrees, in this case would boil at 72 degrees, a temperature of the atmosphere frequently observed in the summer months of this country; and ether, which boils at 96 degrees, a temperature nearly corresponding with that of the human body (being lower only by 2 degrees), *in vacuo* would boil at 44 degrees below zero, or at a temperature lower than that which would suffice to render mercury solid.

The thin aërial fluid called the *atmosphere*, or commonly the air, is a distinct material substance surrounding the globe, and possessing considerable weight. That the air is actually a material substance, may be easily shown by connecting a thin glass flask, provided with a good stop-cock, with the exhausting tube of an air-pump. The air can in this manner be withdrawn, and the flask will be found to weigh less than before. One hundred cubic inches of air, when perfectly dry, weigh, according to very careful investigations of Dr. Prout, 31·0117 grains, the temperature of the air being 60 degrees Fahrenheit, and the pressure of the air, as indicated by the barometer, being equal to 30 inches of mercury.

If, instead of air (the oxygen and nitrogen which constitute the atmosphere), an atmosphere of mercury were to envelop the globe, which would have the same weight as the air, it would be about 30 inches above the level of the sea; and if, in like manner, instead of the air, the fluid water were substituted, it would be nearly 34 feet above the level of the sea. Hence, we say that the pressure of the air is equal to a column of mercury 30 inches in height, or to a column of water 34 feet high; or, in other words, whatever extent of surface we have, the pressure of the atmosphere is equal to the pressure or weight of 30 inches of mercury, or 34 feet of water, over a similar surface.

The amount of this pressure, estimated by the extent of surface, is as 14·7 pounds on the square inch, or nearly 15 pounds. In other terms, the weight of air pressing on a square inch is 15 pounds, and the weight of the column of water is also 15 pounds. That is, the column of air whose basis is exactly a square inch, extending from the surface of the globe to the highest or extreme range of the atmosphere (nearly 45 miles), is equivalent to the column of mercury which is only 30 inches in height, or to a weight of 14·7 pounds.

It is this weight, then, which the water has to overcome before it pass into vapour. The greatest pressure of the atmosphere will be at the surface of the earth; and as we ascend in elevation above the sea level, this pressure will gradually decrease, less air being above us, and in a corresponding ratio the volume will be augmented.

By attending to these circumstances, we perceive that when the pressure is lessened, water boils at a lower temperature than 212 degrees; and therefore, that we have not merely to consider the temperature to which the water is exposed, but also the amount of the weight of the atmosphere at the time, or the height of the mercury in the barometer tube. For example, at Quito, which is 10,000 feet above the level of the sea, water boils at 194 degrees Fahrenheit, while at Geneva, ebullition begins at 209 degrees, that city being 12 feet above the sea level.

The law, then, as regards the pressure of the atmosphere, simply is, that the boiling temperature is uniformly the same when the barometer is at the same height. If we employ the thermometer of Fahrenheit, it will be found that the boiling point is exactly 212 degrees if the barometer indicate 30 inches; but if the boiling point rise to 213 degrees, then the barometer also will ascend to about 30½; and conversely, if it be nearly 211 degrees, the barometer conversely also will fall to about 29½. It is obvious, then, from these facts, that the boiling point is an index of the height of the barometer, and, on the other hand, that the height of the barometer will give the point of ebullition according to the thermometer of Fahrenheit, or any other which may be used.

Experimentally, the effect of a diminution of pressure on the temperature at which water boils may be shown by the common air-pump. If a jar of water, at the temperature of 178 degrees, be placed under the large bell receiver, and the air be withdrawn so as to reduce the pressure very speedily, the water will be found to boil at the reduced temperature. The pressure at which this takes place, as measured by the barometer, is equal to half the ordinary weight of the air, or 7½ pounds on the square inch. If the barometer be retained in the jar, it will be found to indicate 15 inches when the ebullition takes place. Should the barometer fall lower before the boiling commences, then it will also be noticed that the thermometer points to a lower temperature, corresponding always in an exact ratio.

Steam, or the vapour of water, when produced at the usual pressure of the atmosphere, is commonly denominated *low-pressure*, in opposition to that which is formed at a higher pressure than that of the air, and accordingly named *high-pressure* steam. In common language, however, the term low-pressure steam is applied to the steam which has even a force of several pounds on the square inch, and therefore formed at a temperature

higher than 212 degrees. The steam is in this case condensed in working the engine, and receives this general name because the pressure does not range higher than a few pounds.

In order to produce steam of greater pressure or force than that obtained by boiling water in the open air, means must be adopted to confine the vapour as it is generated from the water. If we have a stout copper vessel, containing a considerable quantity of water, and provided with stop-cocks which can be properly closed, and then expose it to heat, a quantity of vapour will be disengaged; but as it cannot fly off, all the stop-cocks being closed, it must necessarily, in proportion to its density, compress the fluid below, and proportionately prevent any further escape of vapour. But the heat being continued and increased, vapour will then rise, which in like manner will increase the degree of compression on the water, for the density of the first disengaged vapour will now be increased by this new accession of vapour, and the further formation of vapour will be checked until the heat is again so far increased as to be able to overcome resistance offered by the pressure of the vapours. In this manner vapour or steam, of any degree of elasticity, may be generated from water merely by having a firm and stout vessel capable of bearing great pressure, in which the vapour is to be formed.

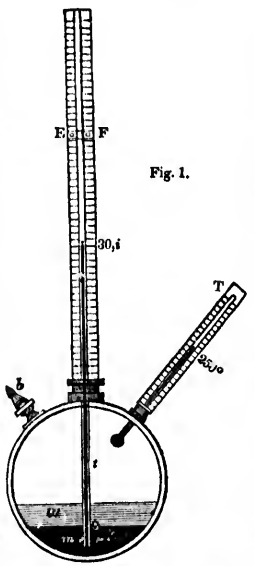


Fig. 1.

The generation of steam in this manner, and the relation between the temperature at which the steam is produced and the pressure upon it, and consequent force or elasticity of the steam, may be illustrated by the apparatus represented in the adjoining cut, fig. 1. A firm copper vessel is procured, sufficient to bear a considerable heat and a great degree of pressure. It is provided with three apertures, as in the figure. The aperture at the summit has a barometer tube, E F, fixed in it, open at both ends, but at the same time perfectly air-tight, so as to prevent all communication between the interior of the vessel and the external atmosphere. The upper extremity of the tube is immediately in contact with the atmosphere, while the lower is very near the bottom of the vessel. In the lower part of the vessel there is a quantity of mercury (*m*), into which the under extremity of the barometer tube dips. At one side of the vessel an aperture receives a thermometer (T), which is securely fixed, so as to be perfectly air-tight, and introduced obliquely, so that the bulb rests a little above the middle height of the vessel. The other or third aperture (*b*) is provided with a stop-cock, which admits of being opened or closed at pleasure. The vessel is now to be supplied with water (*w*), filling it to the middle, and heat is to be applied by a furnace below. It is apparent that if the heat be applied and continued while the stop-cock (*b*) is open, the air will fill the upper portion of the boiler, and the ordinary pressure of that body will be exerted on the surface of the water. The water will therefore, as already noticed, boil when the temperature 212 degrees of Fahrenheit is indicated by the thermometer. But if we now shut the stop-cock, so that there is no longer escape for the steam, the temperature of the water gradually rises, because the heat is continued, and the steam accumulating in the upper part of the boiler, exerts, first on the water, and immediately on the mercury beneath, a force or pressure equal to its increased elasticity. The mercury, is, however, in an open tube, or rather is placed between the extremity of an open tube and the water and its vapour. Accordingly, if the force of this vapour is greater than what is requisite to overcome the pressure of the atmosphere, the mercury will be forced into the tube, and in proportion to the increasing force which it possesses, will the mercurial liquid ascend. In proportion, then, as the heat continues to be applied, the mercury will be seen to ascend in the barometer tube, indicating the force which the steam exerts on the surface of the water in the boiler, while the actual amount of the heat at which the water is passing off into vapour will be shown by the thermometer.

But, as already stated, if the height at which the mercury stands corresponds in a distinct ratio with the temperature, it will be sufficient to ascertain either the one or the other, so as to know both. Suppose the column of mercury has risen nearly 15 inches, or even 60, then we know that the pressure which the steam has is equal to half an atmosphere, as indicated by the mercurial tube, over and above the actual pressure of the atmosphere, so that the whole pressure exactly amounts to an atmosphere and a half. But the thermometer will also have risen, and now will point out a temperature of 230 degrees Fahrenheit—water at that temperature, when converted into vapour, having a force equal to an atmosphere and a half, according to the usual mode of expression. If the heat be still continued, the further ascent both of the mercury in the barometer tube and the mercury in the thermometer will be observed; and when the former stands at 30 inches, the latter will indicate exactly 250 degrees, as may be seen in the diagram. But as 30 inches is equal to one atmosphere, and as the tube was open admitting the pressure of the air, the vapour of water was able to overcome the resistance of two atmospheres; or water under a pressure of two atmospheres boils at a temperature of 250 degrees Fahrenheit, and the vapour possesses that strength in elastic force.

Suppose the thermometer (T) now stands at 250 degrees (*l*), and the stop-cock (*b*) be suddenly turned, an immense volume of steam, formed under the high pressure, suddenly escapes; the mercury in the tube (*t*) falls rapidly, and the thermometer also equally descends, until it attains the temperature of 212 degrees. The mercury will fall down to the level it had immediately under the water, and steam will now be produced as under ordinary circumstances. The moment, however, the stop-cock is shut (the heat still being kept steadily applied), the thermometer will begin to rise, and the column of mercury begin to ascend.

The application of the heat may be continued, in a good stout vessel, up to a greater elevation than what is now described, causing the production of steam of a still higher pressure, and, of consequence, greater elastic force, the barometer and thermometer mutually reflecting each other. It is in this manner that the high-pressure steam, as it is ordinarily called, is generated; but in proportion as the higher the temperature is at which it is produced, the greater is the danger to be apprehended from the bursting of the boiler, unless proper precautions are adopted.

The accompanying table gives the correspondence observed between the temperature at which the water boils, the density of the steam generated, and the force it possesses in inches of mercury and atmospheres.—

Temperature Fahrenheit.	Sp. gr. air at 60 being 1.	Pressure in inches of a column of mercury.	Pressure in pounds on the square inch.
212°	0·484	30	14·7
222°	0·551	35·00	17·15
232°·80	0·637	45·00	22·05
242°·50	0·81	52·50	25·725
250°·20	0·915	60·00	29·4
274°·70	1·33	90·00	44·1
320°·60	2·5	180·00	88·2
350°·00	3·61	270·00	132·3
450°·00	10·75	900·00	441·

By this table we observe that the elastic force of the vapour produced from water rises in a rapid ratio above the ordinary temperature of boiling. If, for example, we take the temperature of water at 350 degrees, the specific gravity of the vapour produced, air at 60 degrees being 1, will be 3·6; and it would have a force equal to maintain a column of mercury 270 inches high, or 22 feet 6 inches, if no atmosphere pressed on the mercury; and 240 inches of mercury, if the atmosphere pressed on the fluid in the tube; the total sum of pressure on the square inch being then equal to 132·3 pounds, or corresponding exactly with the weight of nine atmospheres.

Tables have also been drawn up from experiments, illustrating the force of vapour from water at temperatures below the ordinary point of boiling, as in the subjoined:—

Temperature.	Force of vapour in inches of mercury.
32°	·200
50°	·375
68°	1·00
100°	1·86
150°	7·42
180°	15·15
200°	23·64
212°	30·

From all these tables, it is apparent that there is an invariable correspondence always observed between the force of the vapour of steam and the temperature at which it is generated. Hence the one may be given as the rule of the other. For instance, if it is required to know the force with which the steam is working in any machine, the thermometer, which is preserved in a case air-tight, and introduced into the boiler where the steam is generated, will indicate the temperature of the water, or of the steam (for they are always the same; that is, at whatever temperature water boils to afford steam, the steam so produced is of the same temperature). On ascertaining, then, the temperature by a reference to the table, we find the corresponding force of the elastic vapour (the steam). An example will be sufficient to show this most clearly. When the thermometer stands at 212 degrees, and steam escapes from the water, we know it is then able to support a column of mercury 30 inches high; and a column of mercury 30 inches high is equivalent to the pressure of 1 atmosphere. The steam, then, is of the kind called low pressure. If, however, the temperature indicated be 250 degrees, then opposite in the table we find 29·4 pounds pressure on the square inch, and 60 inches of mercury; but as 29·4 pounds is double the weight of the atmosphere on the square inch, and also as 60 inches of mercury is double the height of the column which the air will support, the steam must then be acting with a force equal to 2 atmospheres.

The force with which steam acts increases proportionally much greater than the temperature at which it is generated. If, for example, the pressure be equivalent to 1 atmosphere at 212 degrees, at 250 degrees it will be equal to 2 atmospheres; that is, in the addition of heat equal to 38 degrees of Fahrenheit above 212 degrees; and at 293·7, which is little more than the difference between 212 and 250 degrees, which gives only an increase of 1 atmosphere, the pressure is equal in all to 4 atmospheres, or double that above 250 degrees; and so on, as will be seen in the preceding table.

Mr. Tredgold gives the following rule to ascertain the elastic force of the vapour of water, in inches of mercury, at any given temperature of Fahrenheit's thermometer. To the given temperature 100 is to be added, and the sum divided by 177. The quotient is to be raised to the sixth power, which is the force required. If, for example, the temperature be 307 degrees; to this 100 added gives 407. This, divided by 177, gives 2·3, of which the sixth power is nearly 148, the elasticity of the vapour, in inches of mercury, almost equivalent to 5 atmospheres. This rule, it is to be observed, only refers to the vapour produced from pure water; when it is mixed with a considerable proportion of saline matter, as in the case of sea-water, a different divisor must be adopted, which is to be regulated by the temperature at which the water boils, for the point of boiling varies with the amount of salt in the water. Water saturated with common salt contains about $\frac{1}{3}\frac{2}{3}$ portions of that matter, and its boiling point is about 226 degrees. The divisor to be used in this case is 185 instead of 177, and the elastic force of the steam will then be found not to exceed 113 inches.

The existence of any body in the aëriform state is only a contingent condition of matter; some, called *gases*, have naturally no tendency to pass into the fluid or solid form; others, however, called *vapours*, are maintained in the gaseous state by the influence of heat—and on withdrawing it, speedily resume their ordinary condition. Steam belongs to this class of bodies, and on being cooled, immediately condenses or returns to the fluid state. The white cloud produced on steam escaping from the safety-valves of boilers, or from high-pressure engines, is not steam, in the strict acceptation of the word, for steam is invisible, but the water formed by the condensation of the steam in consequence of the cold air with which it now mixes. The extent to which the water expands is variously estimated; but it seems to be very nearly that 1 cubic inch of water becomes 1 cubic foot of steam, or the space occupied by 1 cubic inch of water, when converted into steam, is nearly 1700 times greater—correctly as 1 to 1696.

In the state of vapours, the vapour may be in two distinct and very different conditions; it may be immediately in contact with the water whence it is formed, or it may be in a vessel distinct and separate from all connection with the water. In either condition it is a distinct aëriform body, and possesses all these properties peculiar to that class of bodies, it being always understood that the heat is maintained sufficiently high to preserve it in this particular condition, to wit, of vapour. Aëriform bodies, and consequently water, when in the aëriform condition, have a property quite peculiar, denominated their elasticity. This essentially consists in a disposition of all the particles, whereby they have a tendency to recede outwards or fly from the centre, so that they spread themselves out into a more extended area. If, for instance, we have a bladder partially filled with air under the receiver of an air-pump, and then exhaust the air, it will be found, that proportionally as the air is removed from the interior of the receiver, the bladder expands, and finally it will swell, and even be burst, by the expansive force of the air within. Aëriform bodies have a tendency, accordingly, to expand indefinitely, were there not causes which counteract this disposition.

The first of these is the pressure to which they are subject, and the second is the attraction of gravitation, by which all particles of matter are drawn down towards a centre, and which is incessant action. A similar power is also exercised by the application of cold, which diminishes the repulsive tendency. As there is a constant force counteracting this disposition to expand, the elasticity of a gas or vapour is in the exact ratio of the counteracting force. Gases, as they are capable of expansion, so they may be condensed or diminished in bulk. But in this condensed state, as they then occupy less space, there necessarily must be an increase

of the density or specific gravity. Thus, if the space occupied by any gaseous body be equal to 100 cubic inches, and the 100 cubic inches weigh 31 grains; on compressing these to one-half, so that they only occupy 50 cubic inches, each cubic inch will obviously contain double the amount of matter it previously had, and therefore, whatever was previously the weight of the cubic inch, it will now be double. But with this increase of density there is an increase of elasticity; for as the elasticity of a gas is directly proportionate to the force which compresses it, and as this force has diminished the bulk by one-half, hence, as the density is doubled, the elasticity is increased in the same ratio. The elastic force of a gas, therefore, is directly in proportion to its density, and in the inverse proportion of its bulk.

On removing the pressure, then, it seems that gaseous matter extends through space, so as to fill up what otherwise might seem a vacuum.

Incidental to the formation of steam, it may be observed that there is a great quantity of heat which disappears on the vapour being formed, and which cannot be discovered by the thermometer, but is again given out when the vapour returns to the state of water. This invariably takes place, and always in a definite proportion.

The most singular and most important practical fact connected with this property is, that whatever be the temperature at which the water is boiled to form steam, the sum of that temperature and the number of degrees of latent caloric (as the heat which disappears is technically named, from the Latin word *lateo*, to lie hid), is always the same. Suppose the water boils at 212 degrees, and the quantity of latent caloric absorbed be equal to 1000 degrees, the sum of these will be exactly 1212. But if the water boil at 112 degrees (under diminished pressure), the latent caloric will then be 1100, to make up the aggregate sum 1212 degrees; and in like manner, if, under increased pressure, the water be made to boil at 312 degrees, the quantity of latent caloric will only be 900 degrees. Hence steam formed at a low pressure, or at the ordinary temperature of the air, does not require a different amount of fuel that it may undergo this change, than the same vapour generated at 100 degrees higher, or any other temperature; for the sum of the latent and sensible heat is always the same—1212 degrees, as measured by the thermometer of Fahrenheit. To convert, accordingly, a given weight of water into steam, the same amount of fuel is required at all temperatures.

The condensation of steam by water may be easily shown by taking a flask with a small quantity of water in it, and, exposing it to a temperature sufficient to produce ebullition, steam will rapidly be formed, and all the atmospheric air expelled. A cork (previously ascertained to fit accurately) is then introduced into the neck of the flask, which is at the same time withdrawn from the fire. The flask, now full of the vapour of water, is introduced into a vessel of cold water with the neck inverted; on the cork being withdrawn, the cold water immediately absorbs the elastic vapour, and is forced in by the pressure of the atmosphere, so as completely to fill the vessel, if it contained nothing but the vapour of steam. The same phenomenon may be observed by acting in a similar manner with the vapour of ammonia, or of muriatic acid (spirits of salt). The application of this additional property of steam, and the mode of bringing it into play, will be specially detailed under the description of the steam-engine. It is here merely cursorily noticed, lest we might seem to overlook one of the most important properties of this fluid.

It is owing to this important property, namely, the great degree to which it can be condensed by cold water, that the production of a vacuum is accomplished, and the steam-engine rendered complete in almost all its parts.

The chief properties of water, then, as converted into steam or vapour, may be briefly enumerated:—Expansion—the matter in this new condition of vapour occupying about 1700 times the space it occupied as water, the disappearance of a great amount of caloric, which bears always a definite proportion to the temperature at which the water passes into steam; the exertion or display of a definite elastic power, bearing a fixed ratio to the temperature at which it is generated; the natural return of the gaseous fluid to the state of water, either on gradually withdrawing the heat, or on suddenly bringing it in contact with cold water.

Accessory to the consideration of water and its various properties, physical as well as chemical, is the history of the different matters which are employed to give out heat, and to convert it into steam. The consumpt of coal or fuel, of whatever kind it may be, constitutes one of the most serious obstacles in the extension of the steam-engine, and especially in its application to long voyages. The great object is to produce the greatest amount of heat at the least possible expense of fuel. Charcoal, or the substance carbon, is, properly speaking, the principal ingredient in the combustible matters which are usually taken to produce heat. It constitutes the main bulk of coal, of anthracite, a species of coal chiefly found in America. It is found also in great quantities in the matter of saw-dust, tar, &c.

During the process of combustion, the quantity of heat which is disengaged can be precisely determined, as, for instance, by ascertaining how much of a given amount of combustible matter is required to raise the temperature of water from 32 degrees to the boiling point (212 degrees). In a series of experiments made on this subject, Despretz obtained the following results, which are here arranged in a tabular form:—

	Pounds of Water.
1 Pound of charcoal heats from 32° to 212°	78
" charcoal from baked wood	75
" baked wood	36
" wood containing 20 per cent. water	27
" bituminous coal	60
" turf	25 to 30
" alcohol	67.5
" olive oil, wax	90 to 95
" ether	80
" hydrogen	236.4

In this process of combustion, the chemical action consists in the union of the oxygen supplied from the air with the inflammable matter, whether carbon alone, hydrogen alone, or both together. The amount of heat depends exclusively on the quantity of the oxygen consumed, as the important fact has been determined, that the heat evolved was always in a direct ratio with the oxygen lost. Thus, in a series of experiments, it was discovered that

	Pounds of Water.
1 Pound of oxygen with hydrogen raises from 32° to 212°	294
" " charcoal	29
" " alcohol	28
" " ether	28½

The importance of this subject is sufficiently obvious when we consider the immense number of steam-engine incessantly at work, and the enormous annual consumpt of coals. In long voyages in steam-vessels, the greater part of the cargo is necessarily composed of coal instead of merchandise, and thereby one of the chief objects of steaming is virtually defeated.

It is here to be carefully noted, that to raise water to the boiling point, and to convert water into steam, do not imply the same thing, though they both imply the application of heat steadily to the fluid matter. This arises from the great quantity of latent caloric which the steam requires, and which amounts by calculation, as well as by careful experiment, nearly to 1000 degrees of Fahrenheit; that is to say, if it takes a given time, with an equal and

uniform quantity of heat, to raise water from 32 to 212 degrees (180 degrees), it will require that time multiplied by 5½ to convert the water into steam. But in one period (namely, the time required to raise the water to the boiling point) as much heat as raised the water 180 degrees was added, and 180 degrees multiplied by 5½ gives exactly 1000 degrees. It is to supply this great quantity of latent caloric that so immense an amount of coal is consumed by the steam-engine. For if 1 pound of the best coal raises 33·3 pounds of water from 32 to 212 degrees, then one pound will only suffice to convert 5·5 pounds of water into steam. Or while 1 pound of coal raises 33·3 pounds of water to the boiling point, it will require [illegible] pounds more of coal to convert all that water into steam.

To convert the coal into those chemical compounds, during which the formation of heat takes place, a very great proportion of air is required. For the atmospheric air contains four-fifths of its bulk of matter, which does not in any manner assist combustion. Two pounds and a half of oxygen, or nearly 30 cubic feet, are requisite for the combustion of 1 pound of coal: 150 cubic feet, therefore, of atmospheric air will supply this. It has, however, been found that one-third of the [illegible] which enters the furnace passes through it without directly contributing to the process of combustion, but withdraws heat. The actual amount, therefore of air required is about 220 cubic feet in round numbers.

In these observations made regarding the boiling point of water, whether in the open air or under varying degrees of pressure, the water is to be held as pure, or nearly so. For when it is mixed with much saline matter, the temperature at which it boils is raised. Water, it may be noticed, saturated with common salt, boils at a temperature of 226 degrees Fahrenheit. The temperature at which water containing various proportions of salt boils is given in the annexed table:—

Proportions of Salts.					
Common water,	.	.	.	0	212
Sea water,	.	.	.	1/33	213·2
Boiler water,	.	.	.	2/33	214·4
.. ..	.	.	.	3/33	216·7
.. ..	.	.	.	4/33	219·0
.. ..	.	.	.	5/33	221·4
.. ..	.	.	.	6/33	223·7
Saturated water,	.	.	.	12/33	226·

In steam-boilers, where the water used contains a great quantity of saline matter, a particular process is resorted to called *blowing out*, by which the heavy water impregnated with saline matter is removed, and the salts prevented from accumulating. From such a mechanism not being known at the time, the City of Edinburgh steamship, on her first voyage to Leith, had her boilers so obstructed and rendered useless by the immense accumulation of salts, that it was found necessary to clear the boiler out on the voyage, while she proceeded under canvas during the time. Some further remarks are to be found under the description of the marine steam-boiler

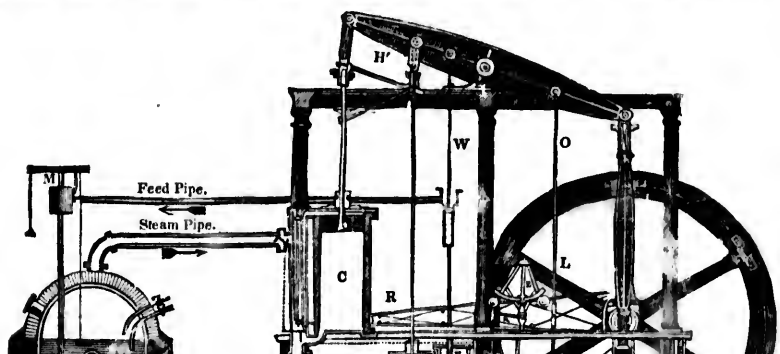


Fig. 2.

DESCRIPTION OF THE ENGINE, &c.

The entire apparatus of a steam-engine is comprehended in two distinct parts—the Boiler, which generates the steam, and the Engine, by which the duty of the steam is performed. It is necessary, however, to remark, that there are various kinds of engines, differing as to mechanism. Two general divisions may be formed of them—1st, Those in which condensation takes place, or low-pressure engines; and 2d, Those in which there is no condensation, or high-pressure engines. In the first class we have the common atmospheric engine, as it is called, invented by Newcomen, and long in use; then the double-acting engine of Watt, working by pressure and condensation, or working by pressure, expansion, and condensation; so, also, in the second class, we have engines working only by pressure, and engines working by pressure and expansion. In the subjoined cut, fig. 2, we present an outline of what may be esteemed the most complete engine of the condensing class, with the boiler adjacent, and connecting pipes.

We shall now proceed to describe the various parts of this most ingenious apparatus. And, first, of

The Boiler.

The boiler, as its name implies, is the large iron vessel in which the water is exposed to the action of heat, so as to be converted into steam. In its structure and connection with the cylinder (that part of the engine in which the steam acts), it constitutes a very beautiful illustration of different pieces and forms of machinery all happily arranged, so as to contribute to one important end. In examining the boiler, we have to attend to the following leading parts or portions of mechanism:—The form of the boiler, the feed-pipe, the steam-pipe, the

damper, the steam-gauge, the gauge-cocks, the safety-valve, the internal safety-valve, the man-hole, and the furnace. Fig. 3 is a representation of the various parts on a minute scale.

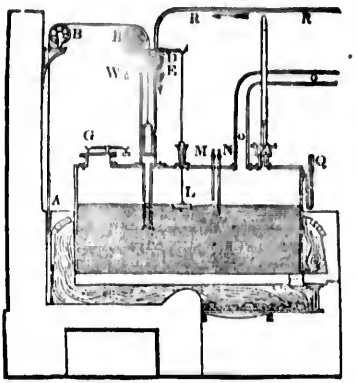


Fig. 3.

Various forms have been proposed for the low-pressure boiler. That which is chiefly used as here represented, is called the wagon-shaped; it is fashioned in a semi-cylindrical manner above, the sides being nearly perpendicular, while the face is gently concave or hollow. When the pressure is not great, that is, does not exceed six or eight pounds on the inch, this form of boiler is sufficient for the generality of purposes. The chief object in selecting the form of the boiler is, that it may permit the water to pass speedily into vapour with the smallest amount of caloric, as little as possible being given off to the surrounding matters and atmosphere. For it is to be here observed, that when two bodies at different temperatures are placed contiguous to each other, the warmer of the two soon becomes cooler, and the colder becomes warmer, so that after a given lapse of time, they both have the same or a common temperature. It becomes, therefore, an object of the utmost moment to place the boiler in such a position that as little heat as may be can escape from it. This is effected by building it in brickwork, or matters which are bad conductors of caloric.

Whatever form may be selected for it, it has two main pipes, one which conveys the steam from it (O); and the other, which, as it supplies it with water to generate the steam, is called the feed-pipe (R).

It is further provided with several other highly important and essential parts; these are the *steam-gauge*, which indicates the elasticity or force of the steam which is formed; the *gauge-cocks*, by which it is known whether the boiler is supplied with the proper amount of water or otherwise; the *safety-valve*, so denominated by way of distinction, which allows a free egress to the steam, when pressing beyond a certain force, and thereby preventing any danger from explosion; the *internal safety-valve*, which obviates any risk of the sides of the boiler collapsing by the pressure of the atmosphere—should, from any circumstance, the force of the steam become inferior to that of the external air. To these there is to be added the *man-hole*, which is for the object of cleaning the boiler out when requisite.

The feed-pipe is a very ingenious arrangement by which water is brought to the boiler. It proceeds from a cistern (E) situated immediately above the boiler and extends into the boiler a little lower than its middle height.

The water which is conveyed to this cistern is drawn from the hot well (H) (a part of the engine connected directly with the condenser, and afterwards to be noticed) by means of a pump worked by the engine (W), fig. 3. As this water is of considerable warmth, a proportionate saving accrues in using it. The water, however, does not enter this tube to pass to the boiler always in a continuous stream, independent of the condition of the boiler as to its being scantily or liberally supplied with water, but, by an ingenious arrangement, it is made to descend in such a continuous current, so as exactly to be equivalent to the amount of water expended in the formation of steam. This is accomplished in the following mode:—A valve is situated at the bottom of the cistern, which is made to open upwards, on the rod being raised which connects it with a lever (D). This lever is so placed as to move on a fixed point at the upper part of the cistern. At one extremity of it a small wire (K) is attached, running through a steam-tight aperture in the boiler, having a float (L) at its termination resting on the water. To counterpoise this, there is a weight (W) suspended at the other extremity of the lever connected with the cistern. As this float is balanced in the water, when it is rapidly evaporated it will follow the water level, and as it descends, necessarily will bring down the arm of the lever to which it was connected; the other arm will be elevated in a corresponding manner. But the valve in the feed-pipe being attached to a rod which is fixed to the lever, will be carried upwards as it is raised, and the water will pass down, until the float, being raised in a corresponding degree, will enable the other arm of the lever to which the counterpoise was attached to fall, and thereby bring down the other end of the lever, and close the valve. By this arrangement, as long as there is a sufficient supply of water, from which the cistern can be filled, there will always be a sufficiency running down in a stream continuously to feed the boiler for the production of steam.

The steam-gauge (Q) is adapted to the boiler, in order that the engineer may always be able to know the elastic force of the steam. Its form and principle are illustrated by the subjoined figure. A tube, curved in the form of the letter U, is connected with the boiler from which the steam is disengaged. This tube is open at both extremities (perfectly analogous to the tube rising from the centre of the stout copper vessel in which the principle of the formation of high-pressure steam was explained; (see p. 76), one of which is immediately exposed to the air or vapour in the vessel, while the other is directly under the influence of the pressure of the atmosphere, whatever that may be. Into this tube mercury is introduced, which, supposing the boiler to be full of air, or of steam having the same tension as the atmospheric air, will have the same level in both legs of the tube; should, however, the fluid ascend in A, that in B falling in a corresponding degree, the steam pressing on B must have a greater force than the external atmosphere and the difference in the levels of the mercury in the two limbs will indicate the excess of the force of the steam above one atmosphere. Every two inches' difference in the levels indicates a pressure of one pound on the square inch. Conversely, the fluid mercury falling in A, and rising in B, indicates that the steam is *not* of pressure equal to that of the air, the proportion of which is to be determined in the same manner. This tube may be constructed either of glass or of iron. If a metal tube is employed, a thin wood rod is introduced, with a float

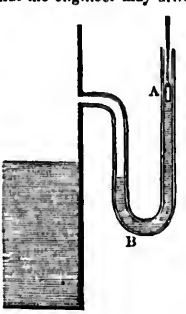


Fig. 4.

in the open end A, so that the distance of the mercury from the level of the summit of the tube is easily ascertained.

The gauge-cocks (MN) are two pipes or tubes, armed with stop-cocks, passing vertically downwards into the boiler. These tubes are of unequal length. One descends somewhat more than the third of the depth of the boiler from the summit, the other somewhat less; so that the former dips in the water, while the other opens into the air or vapour a little above the water level. When the boiler is filled with its proper amount of water, and steam duly formed, on opening the stop-cock of the longer tube, water will be discharged; and on opening the shorter, steam will escape. If, however, there be an excess of water, so that the less also dips into it, water will be projected from both; and again, if from inadvertency the water be deficient, so that the longer tube dips into air or vapour, the water-level being below it, steam, on both the stop-cocks being opened, will escape freely.

The safety-valve (G) is designed to permit the free escape of the steam when it is generated of greater elasticity than is required, or the sides of the boiler are well able to resist. If we suppose the boiler can bear a pressure of twenty pounds on the square inch at every part of its surface, and there were no valves, should the force of the steam be increased so as to exert a pressure of twenty-*one* pounds, the walls would necessarily yield, and an explosion be the result. If, on the other hand, we suppose that the engine will work well with an elasticity of four or five pounds on the square inch, it is apparent, that so long as the elasticity does not increase, the steam will pass by the steam-pipe freely to the cylinder, and the steam-gauge in the boiler will indicate the pressure to be that now stated. But, while things are in this state, if we were to render *one point* of the boiler so weak that a force of ten pounds would be too great for it, and the steam were to acquire an elasticity sufficient to overcome that, a rupture necessarily would take place at that point, or the boiler would burst. The valve is then to be considered as a part of the boiler, which yields to a pressure much less than that which would be capable of bursting the boiler, but which permits a pressure to be made sufficiently strong to allow the free working of the cylinder with steam of or under a definite pressure. The mode in which the valve is frequently made to work is by the steel-yard. This is a lever having a support fixed close by a tube communicating with the boiler. The aperture of this tube is closed by a plug or plate, which is fixed to the lever, and weights are arranged in the usual manner to the extremity of the lever. If the atmosphere and the weight fixed to the end of the lever are unable to resist the elasticity of the steam which is generated in the boiler, its greater pressure forces the plug upwards, and the tube being opened, the steam escapes.

It is apparent that, if the tube were open, steam could not be generated of higher pressure than one atmosphere; again, if the boiler were made of sufficient strength to bear the pressure of 16 atmospheres, it could be heated sufficiently so as to give steam of that force without danger. But as the safety-valve may be loaded upwards with a pressure ranging from one pound on the square inch to 100 or more, it is evident, that so long as we are secure of the positive strength of the boiler, we may cause steam to be generated of any given strength, within the range determined, merely by adding or subtracting from the pressure on the safety-valve. From different causes, as, for instance, the valve adhering to the tube, or corrosion taking place, or the aperture being too small, it is occasionally inefficient, and from this explosions may arise, should the force of the steam be greatly augmented.

In some boilers, two safety-valves are employed, the one being at a much lower pressure than the other; so that when it yields, the engineer has a clear intimation of the increasing elasticity of the steam, and then can easily adopt precautionary measures. It has been strongly recommended that in every instance there should be two valves. Hastily, indeed, has the observation been made, that the more valves the better, as it is altogether improbable that they can all be obstructed at the same moment.

A plug of fusible metal is occasionally used in boilers which are raised to a very high temperature. The fusible metal is an alloy (mixture) of different metals, which are so apportioned to each other that the mass will melt at any given temperature. For instance, there is the popular toy, the fusible spoon, which will melt and totally liquefy in a cup of tea a little below the boiling point of water. Now, it has been already stated that steam of higher elastic force than that of the air can only be formed at a higher temperature than 212 degrees, at which it is formed under the ordinary pressure of the air; when, therefore, the steam is generated of a greater elastic force, it must be at a proportionally higher temperature; and if, then, there is a fusible plug which liquefies or melts at that particular degree of heat, it will be melted, and an outlet at once given to the vapour and water; it will be, in other words, the same as a valve. However ingenious in theory this invention may seem (and it certainly has considerable credit), it does not so happily correspond in practice, as it is found that the metals melt unequally; or, in other words, that the most fusible melts at the low temperature, and is retained in the small cells of the less fusible, so that the whole may not be fused until a temperature is obtained 100 or 200 degrees higher than what was arranged or anticipated; and accordingly, by trusting to this alone, every danger that might occur from an explosion is to be apprehended.

The furnace under the boiler is so arranged that the fuel is thoroughly consumed; and further, so that a draught of air may have free access to the fuel, which may be increased or diminished by means of a damper (A), worked on the wheels BB, when the steam is coming off too rapidly or too slowly for the demands of the engine. This object is effected by a contrivance somewhat analogous to the mode in which the supply of water is regulated for the feed-pipe, through the medium of the float and valve connected with the cistern.

The Engine

Is that part of the steam-engine where the force or power is developed by the action of the steam, and thence by appropriate machinery adapted to whatever object it is desirous to give the impulse of a first moving power. There are a number of parts essentially belonging to the engine, each of which requires to be considered separately, in order that the mechanism of the whole may be rightly understood. These parts are—the cylinder, the condenser, the air-pump, the hot well, the cold water-pump, the beam, the crank, the fly-wheel, the governor, the eccentric and valves, and the indicator. For the convenience of description, these parts and the minor subordinate pieces of mechanism, may all be arranged under two heads—1st, Those relating to the steam; and 2d, Those connected with the motion, the regulation of the valves, &c. The engine now to be described is that called the *double-acting engine*, so named in opposition to the *single-acting engine*, in which the piston is forced downwards by the steam, but is elevated by a weight attached to the remote extremity of the beam. It is so called because the motion *downwards* and the motion *upwards* are both effected solely by the agency of the steam.

The cylinder (C, fig. 2) is the stout iron vessel into which the steam is introduced, and by its elastic force

according as it is alternately admitted and withdrawn below and above, causes the piston-rod to ascend and descend by an alternate and almost uniform movement. This iron vessel is steam-tight at the aperture where the piston-rod moves, and is equally so at the different apertures by which the steam either enters or escapes, these apertures all being securely protected by valves. When the piston has arrived at the top of the cylinder, the lower part is full of steam. To produce a vacuum, so that the piston may be readily depressed by the introduction of steam above, this vapour below must be removed. For this purpose the cylinder has a valve at its lower surface connected with the *condenser* (an apparatus immediately to be described), and on this being opened, the steam rushes into it and is condensed. But while this has taken place, the passage to admit the steam above the piston is opened, and as it enters immediately, by its elasticity it depresses the piston to the bottom part of the cylinder, constituting the downward movement.

But the piston has now arrived at the lower part of the cylinder, and it is required to raise it to the summit again. This is effected by the very same arrangement as that employed to bring it down. The steam which is in the cylinder above the piston is now, by the shifting of the valve, allowed to communicate freely with the condenser, escaping from the upper aperture in the cylinder. In this manner a vacuum is produced above, and the steam simultaneously being admitted from below, the ascent of the piston takes place to the upper part of the cylinder. By a continued succession of this alternate ascent and descent, motion is communicated to the beam, and thence transferred to whatever object it is desired to affect.

The condenser (A, fig. 2), is the next part to be described. The position of it is under and at a little distance from the cylinder, with which it communicates directly by a pipe or tube. The condensation of the steam by the aid of cold water, it will be remarked, is effected at a distance from the cylinder. This, indeed, constituted the chief improvement of Watt. The condenser may be considered as a vessel with three apertures in it—one leading from the cylinder, protected by a valve; another leading from it to the air-pump, also protected by a valve, permitting the free passage of matter, whether water or gases, to the air-pump, but not allowing any backwards into the condenser; and the third or last tube, which allows fluids also to escape, but has no communication with the air-pump, the fluids being discharged into the cold water which surrounds all this part of the machinery: this is usually named the *snifting* valve. But there is also another aperture, through which the cold water is admitted to the condenser; this is regulated by the injection-cock. This cold water, when it is thrown in, immediately condenses or absorbs the vapour of steam, so that a vacuum, comparatively speaking, is formed; for, as has been already observed, one cubic inch of water expands into 1700 cubic inches of steam, and therefore the converse takes place during the condensation; that is to say, the 1700 cubic inches now occupy a space not exceeding one cubic inch.

The condenser-gauge is intended to determine the force of the vapour which may be in the condenser, for it must be observed, that a complete vacuum is scarcely ever produced. The extent of the vacuum it is essential to know, in order that the engineer may precisely ascertain how far it is working correctly. It may here be observed, that water can exist in the form of vapour even at very low temperatures. The force or elasticity it possesses is to be determined in the ordinary mode by a bent tube containing mercury, open at one extremity to the condenser, and at the other to the atmospheric air—the same principle, in short, as was applied to the estimation of the force of steam in the boiler.

Immediately contiguous to the air-pump is the hot well (H), into which the hot water from the condenser is brought, and any aëriform bodies remaining in the condenser. The piston of this air-pump being drawn up by means of the connection it has with the great cross-beam, a vacuum is produced; but at the lower part of the air-pump there is the valve communicating between it and the condenser. This valve, however, opening towards the air-pump, not in the other direction, the fluids pass immediately towards the air-pump; and the descent of the pump, the fluids are necessarily driven back, but their return to the condenser is altogether prevented by the structure of the valve; accordingly, from the compression they are exposed to, they open the valves of the air-pump piston, and are carried to the upper part, where they are gathered together. On the ascent of the piston taking place, they are carried by it and brought into the hot well.

As the piston which works the air-pump is attached to the great arm of the beam, it is apparent that its operation is carried on steadily while the engine is acting, and accordingly, that the fluid formed by the condensed steam, as well as the fluid which produced the condensation, is incessantly being removed from the condenser, and successively brought to the hot well.

To supply this part of the engine, there is a pump which brings cold water into the cistern in which the condenser is placed. From the character of the water which it conveys, it is technically named the *cold-water pump* (O, fig. 2). At the point, then, where the heated water is drawn from the condenser, and brought into the hot well, the course of the water, proceeding from its fluid state in the boiler, then as steam, and finally condensed, may be said to be concluded. The water, however, it was observed, in the state of steam, acquires a great amount of heat, somewhat more than five times the heat required to raise it from the freezing to the boiling point. It is then returned by means of a tube to the cistern which is placed above the boiler, and supplies the feed-pipe leading to the boiler. The mechanism employed here has already been detailed. It will therefore be apparent, that a quantity of the water which was at the beginning in the boiler, is returned again to it, having previously passed through the state of steam, and having been condensed, performing a complete circle of changes.

The air-pump is not merely observient to removing the water found in the condenser, but it effectually removes the gases which are found associated with the steam, and which exist also always in certain amount, more or less, in water. These gases, were they to accumulate in the condenser, would effectually interfere with the production of a vacuum, and the consequent efficiency of the engine, by the accumulation of heated water, which would oppose the dissolving the steam or condensing it, as the term is. The air-pump is usually made to equal one-fourth of the cubic contents of the cylinder.

There is not, perhaps, any piece of mechanism so complete in all its various parts as the steam-boiler, or all those parts which are immediately subservient to the purpose of forming the steam—conveying the steam to the cylinder, condensing it, and again returning it in the form of water, from which it was originally produced, to be again converted into the same powerfully elastic body by the agency of heat. If, indeed, the condensation could be effected by other means than the agency of water, all the steam might be returned to the boiler, and thus, in an unceasing circle, the amount of water at first started with would suffice.

At first sight, it might appear that these were all-sufficient to determine the movements of the steam-engine, but there are other parts which are no less essential to the perfection and uniformity of its movements. These are, the eccentric rod, the governor, and indicator.

The eccentric rod (R, fig. 2) is designed to work the valves, which were formerly managed in a very different manner, by means of catches or lappets fixed to the air-pump, and so placed as to elevate levers, which opened and closed the valves at the proper intervals. These valves require to be worked in a vertical manner, so that the steam may alternately enter and be shut off from the aperture into the cylinder, at the top and the bottom; and the regularity of the movement of these valves is indispensable to the permanent uniformity of action in the engine.

The eccentric consists of a circle of metal connected with a revolving axle, while the centre of the circle differs from the centre round which the revolutions of the axle are performed. It receives the name *eccentric* because it is out of the centre (*ex*, the Latin for *out of*, or *away from*). If we suppose a circular metallic plate made with a shaft fixed in it, on which it revolves, but which is not in the mathematical centre, that is, the real centre of the circular plate, and if we suppose the diameter of the circle to be four inches, the exact centre will be two inches, or the radius of the circle will have that length. If, then, the shaft is fixed into the metallic plate firmly in the middle of the radius, that is, at one inch from the circumference, and therefore at the same distance from the centre, it is obvious that, as the metal plate revolves so as to complete half a circle, three-fourths of the whole diameter will be placed exactly to the outer side of the axis on which it revolves; and on the revolutions being completed, the three-fourths will then be on the interior side, as the axis on which the plate revolves is permanently a fixed point. Round this eccentric a ring is adjusted with screws, to which metallic rods are fixed. As the eccentric revolves, the ring does not associate in the rotatory movement; it will, however, be carried to the right and left by the movement of the centre of the eccentric, as it comes round the axle. And as, in the case we have proposed for illustration, the distance between the real centre of the ring, and the centre of revolution is one inch, the attached rod will be moved twice that space to either side during the revolution which the horizontal axle performs.

In this manner a rectilineal movement is procured from one that is circular; and by means of levers arranged at the extremity of the rod around the eccentric, the valves are alternately elevated and depressed, so as to permit the free entrance of the steam to the cylinder above the piston, while free exit is given to the steam below to the condenser, and then to permit the equally free ingress of the steam below the piston, while the escape of it from above is equally free to the condenser. Whatever variation may be given to the levers employed, the principle is the same, in so far as a horizontal lateral movement is obtained through the medium of the eccentric.

In the escape of the steam, either of increased elasticity or increased quantity, it is obvious that the movements of the engine will become more rapid, and so much accelerated as not to be adapted to the work it is intended that it should perform. It became, therefore, an object of the highest importance to regulate the quantity of steam as it was transmitted from the boiler by the steam-pipe to the cylinder. To accomplish this, Watt very ingeniously applied the mechanism so long employed in mills, and which is almost universally known by the name of the *governor* (Z, fig. 2). The nature of this piece of mechanism will be understood by the foregoing figure. A spindle or upright rod, with a pulley on its lower part by which it is moved, receiving motion through a strap attached to the shaft or axle, has two balls, which revolve along with it. These balls, by the means of joints, may be separated considerably from, or brought nearer to, the spindle. Two levers are connected with the rods to which the balls are attached, having a free movement on other levers similar in length and thickness, but which meet in a metallic ring movable upwards and downwards on the spindle. Immediately above the ring, a lever is placed transversely across the ring, fixed at one point, but connected to another which is bent, to the end of which the throttle-valve of the steam-pipe is attached. This valve, it may be here noticed, is intended to regulate the supply of steam, allowing it to escape when horizontal in full stream, and obstructing it proportionately as it assumes a vertical direction. When, therefore, the engine acts with increased speed or velocity, and the main shaft to which this spindle is attached is revolved with a proportionate degree of rapidity, the balls will recede to a greater distance from each other, and accordingly the levers acting on the throttle-valve will raise it so as to diminish the flow of steam. But if the shaft revolves slowly, the spindle also having its velocity regulated by it, the balls will naturally approximate each other, and the lever will now so act on the valve as to throw it completely open, and thereby permit the steam to enter in a full current to the cylinder, and accelerate the motion.

Whatever is the velocity of the axle, such also will be in a proportionate ratio the velocity of the spindle, and in a corresponding manner will the position of the throttle-valve, either to close or enlarge the opening, be modified. In the engines built for Ibrahim Pacha, there is no governor, the valve of the steam-pipe being immediately under the control of the engineer by means of appropriate levers, as in all marine engines.

The indicator is a piece of mechanism devised by Watt, by means of which the force of the steam, and the state of exhaustion in the cylinder, are known at the different periods of the stroke of the piston. It is a small cylinder 8 inches long and 1¾ inches in diameter, communicating directly with the cylinder, and supplied with a piston. If the force of the steam in the cylinder exceeds the pressure of the atmosphere, the piston of the indicator then rises, and if it be less, is depressed. A tracer is connected with the indicator, by which a curve is drawn on paper, indicating the variations occurring in the pressure of the steam.

Hitherto, those parts only have been detailed which are immediately related to the course of the steam. There remain now to be described those parts more directly, or rather essentially, connected with the regulation of the motion: these are the beam, the crank, and the fly-wheel.

The beam is the large and strong mass of iron moving on a centre, and resting on a large pillar or pillars firmly secured to the base of the machinery and floor. It is so fixed on the summit of the pillar, that it may move freely on its centre, so that the extremities can alternately rise and fall with the alternate elevation and descent of the piston: the pump-rods attached to the beam are also worked in the same manner, and so were the valves formerly, but the latter are now acted on by the eccentric, which has been explained above.

In the single-acting engine, where the steam is employed to depress the piston, and a weight at the end of

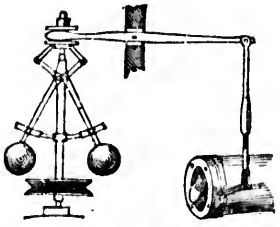


Fig. 5.

the bearr to elevate, the connection between the piston and the beam is by means of a chain, as the force acted on the beam only during the descent of the piston. When the double-acting engine is in play, the beam is pulled down by the piston-rod, and a chain would be sufficient for this end; but when the piston ascends, any force communicated from it to the beam, through the medium of the chain, would be totally lost; for as the piston was carried upwards, the chain would relax, and the beam remain in the condition it was at the beginning of the movement upwards.

A different mode of connection, therefore, is required. of such a mechanism, that the inflexible connection between the arch-head of the beam and the piston-rod may push the beam upwards. Different plans were proposed to effect this end, one of which was the suggestion of Watt, namely, to attach to the end of the piston-rod a straight rack, which could play in a similar rack formed on the arch-head of the beam. But this did not suit well, for the movement in the stuffing-box of the cylinder, if not of the most equable and smooth character, rendered the working of the cylinder inefficient, by allowing the steam to escape, or the air to enter. This plan, then, was ineffectual; and it, as well as others, have all yielded to that most elegant disposition of mechanical forces to which the term *parallel* motion is given (H, fig. 2).

The Crank.

The movement produced by the ascent of the piston and its descent, acting on the beam alternately, causing its elevation and descent, is to be converted into a perpetual circular movement, in order to adapt the engine for the great number of purposes for which it is usually employed. This is effected by the Crank. This piece of mechanical apparatus is to be held merely as the handle of a wheel, which turns it round on any power being applied, as the hand of a man. The line stretching out like one of the radii of a wheel from the axis, is called the crank; the rod, again, at right angles to it, is called the *crank-pin*, while the rod at the other extremity is the *crank-axle*. In the steam-engine, then, a rod is attached to this crank, which (through the beam) is connected with the piston-rod in the steam cylinder; as it ascends and descends, an impulse is necessarily given to the crank, which causes one-half of a circle in the one movement and one-half in the other. When we reflect on the nature of the movements produced, it is apparent that there are two distinct movements, one upwards and the other downwards, and consequently that there is a cessation of impulse at the alternate change of the direction of the force. For when the steam enters above the piston, it depresses naturally the piston to the bottom of the cylinder. It is then, however, intercepted previous to its being introduced below the piston, during which time there can be no moving power exerted. Again, when the steam is introduced below, the same succession of actions arise; and when the piston is at the summit of the cylinder, there is, for the same reason as in the movement downwards, no force exerted. These two points, then, at which there is no power acting on the crank so as to turn it round, are usually denominated *dead points*.

How, then, is the movement continuously carried on? what is it that prevents the action of the crank ceasing at these two points? The crank and axle have received from the engine a certain amount of motion, and as the motion which it has received continues after it has come to one or other of the dead points, it continues still to move in consequence of the momentum it has received, and with force sufficient to carry it beyond the range of the immovable point. But now that it is liberated from these points, it becomes immediately acted on by the piston-rod's connection through the connecting rod. In this manner it is carried through the other half of the circle, until it comes to the other dead point, where, from a similar cause, it does not stand, but is urged round, and in this manner a continuous circular movement is effected The fly-wheel, also, in a similar manner assists in clearing the dead points. The velocity with which the movement is carried on is not equal, for, in the first place, there are the two dead points through which the crank is worked solely by the impulse or momentum it had already received; and, in the second place, from the mode in which the connecting rod plays on the crank, it must be greatest where the angle of these two is a right angle; and diminish proportionably as it recedes from that position to the dead point, where it is least. The reality of these dead points, and also of the unequal velocity, any one may easily see if he attend to the commencement of the motion of the engine, when the steam has not got sufficient force, when he will find that it cannot carry the crank beyond the point until it is urged with increased force; and the same will conversely be seen as the engine is stopping. The continuous movement being effected in this manner, it is apparent that it is not always at every point produced with the same force; and therefore that the action, though, in as far as the amount of force exerted be the same, yet it is unequally divided over a given time, as, for instance, a revolution of the crank. But this would not suffice in the very nice and equable movements and applications of force to which the steam-engine is now so universally applied in the various manufactures of this country. To render the machine as perfect as possible, the fly-wheel was constructed for this object. This is merely a large iron wheel attached to the axis turned by the crank, and consequently carried along with it in its revolutions. This wheel is made very heavy, with the object that it may produce uniformity in the motion by the momentum which it receives, (L, fig. 2).

This arrangement has been found sufficiently perfect in the more ordinary cases, where an extreme degree of equality and nicety of movement is not required. Where such is an essential point, then the plan devised by Mr. Ruckle of Soho is that which is to be put in execution. By means of a wheel working in the rack of another and smaller wheel, the action of the engine is made subservient to drsw a piston from the bottom of a cylinder, so as to leave a vacuum. When this piston was at the summit, and the vacuum below, the action of the steam being withdrawn, it necessarily was carried down by the pressure of the atmosphere, acting with a force of 14·7 pounds on the square inch. A considerable amount of power was thus employed in producing a vacuum, which was regained by the atmospheric pressure. This arrangement was next adopted in flour-mills with the most complete success, and subsequently has been carried into effect in other mills with equal success. From the uniformity of the movement produced, the quality of the matters produced has been greatly enhanced.

Having described all the parts connected with the engine, we have now to consider the mode in which it is worked. The first point, after the steam has begun to be freely produced in the boiler, is to expel all the air which may be in the different parts of the apparatus by opening the valves, and allowing the steam a free transit, finally permitting it to escape by the shifting-valve. When nothing but steam fills the different cylinders, then the noise at the shifting-valve ceases, and the injecting-cock for the cold water is to be trimmed for the purpose of throwing in the cold water to produce the condensation of the steam.

The steam is now ready to act on the piston, and when it has moved it (whether admitted in a full stream, or expansively, it matters not) to the extremity of the cylinder, by the mode in which the valves are disposed, it passes immediately to the condenser, where the cold water play

ing on it, converts it to its original condition of water. The alternate elevation and depression of the piston being continued, and the steam passing eventually to the condenser, this latter part would soon be completely filled by the condensed water, so as to be totally unfit for its duty. This is obviated by the action of the air-pump, the valves of which are arranged so as to open only upwards. By means of the piston of this air-pump, the fluids are carried to the hot well. To this hot well a pump is attached, by which the water, which is of considerable warmth, is conveyed to the cistern (M, fig. 2) situated over the boiler immediately at the summit of the feed-pipe (R, fig. 3). The beam of the engine carries a rod by which this pump is worked, as well as another through which cold water is continually supplied. The valves by which the steam escapes from above and from below the piston, during its alternate ascent and descent, are opened and closed by the eccentric (R, fig. 2), and the force and power with which the engine should work is determined by the governor (Z), in the mode already explained, the continuity and the uniformity of the movement being mainly controlled by the fly-wheel and crank, or by the crank and pneumatic pump of Mr. Ruckle.

In this manner the engine continues its action as long as it is supplied with a due proportion of steam; and if there is a definite force with which it should act, on the supposition that there is always abundance of fuel and water, the amount of steam is definitely maintained by the governor and throttle-valve, and by the float in the piston the exact quantity of water is duly preserved; and also by the damper, a greater or less current of air enters the flues, either to increase the production of steam when it is tardy, or diminish it when generated in excess. By the proper arrangement of the valves, likewise, no danger can result from the boiler, and thus, in the strict sense of the word, it is a self-acting and self-adjusting machine; it does, in short, as has been truly said, every thing but speak.

Expansive action of Steam.

Steam, it is already observed, being a vapour, possesses consequently the expansive property peculiar to such bodies, and as the piston either descends or ascends by the impulse of the steam, it follows that the velocity of the stroke is not equal all throughout. Suppose the piston is at the summit of the cylinder, and the steam enters above, the piston will then begin to descend, opposed only by its inertia and friction against the sides of the cylinder. But as the motion downwards continues, this becomes accelerated from its own inertia, and therefore the resistance being less than at first, the steam forces it downwards with increased velocity. The velocity will be at the *maximum*, or nearly so, when it has completed the descent. Watt, ever alive to all the modes of bringing the greatest effect from the steam, considered that a moving power, in addition to that obtained by the stroke of the piston, might be obtained and rendered practically available. We refer to a method of still doubling the effect of the steam, and that tolerably easy, by using the power of steam rushing into a vacuum—at present lost. This would do little more than double the effect, but it would too much enlarge the vessels to use it all: it is particularly applicable to wheel engines, and may supply the want of a condenser, where the force of steam only is used. Open one of the steam valves, and admit steam until one-fourth of the distance between it and the next valve is filled with steam; then shut the valve, and the steam will continue to expand and to press round the wheel with a diminishing power, ending in one-fourth of its first exertion. The sum of the series will be found greater than one-half, though only one-fourth of steam was used.

This mode of using the steam expansively may be illustrated in the following manner:—If the piston is pressed by a weight of one ton, and can be raised four feet, when the cylinder is supplied with steam of the ordinary pressure of one atmosphere, the same piston loaded with four tons will be raised one foot, if the cylinder be one-fourth full of steam of four atmospheres. When the steam of four atmospheres is admitted, it is cut off when the piston is raised one foot. But the piston has now received an impulse, and the steam, beginning to expand under it with a gradually diminishing force, is raised to the second foot, the volume now being doubled, and its elasticity only equal to two atmospheres. On the piston being elevated to the third foot, the volume of the steam will be trebled, and its pressure or elasticity now reduced to one atmosphere and a third. But when the piston is raised the fourth foot, the steam will now have become quadrupled in volume, and the force equal to that of one atmosphere.

This principle is now much employed, and particularly in the Cornish mines, where it has been used with great success, the pressure of the steam in these engines being four atmospheres. The benefit of working a steam-engine in this mode increases the earlier the steam is cut off, but not much after steam is rarefied four times.

Steam cut off.			Power multiplied.
$\frac{1}{2}$	..	..	1·7
$\frac{1}{3}$	..	..	2·1
$\frac{1}{4}$	..	..	2·4
$\frac{1}{5}$	..	..	2·6
$\frac{1}{6}$	..	..	2·8
$\frac{1}{7}$	..	..	3·6
$\frac{1}{8}$	..	..	3·2

Single-acting Engine.

The machine already described is the common double-acting engine, as it is named, or simply the steam-engine in a complete form for application to useful machinery. A few remarks will be sufficient to explain the nature and principle of the single-acting engine, and the purposes for which it is specially employed. In this form of the engine, the principle is in part that of the old engines, where the atmospheric pressure was brought to act, and also of the new or engine of Watt, in which the steam is condensed in a separate vessel.

The single-acting engine was that which Watt first invented. In the form of the engine, the steam was admitted only above the piston, at first the vacuum being below it. When the piston had gained the lower part of the cylinder, the communications between the steam-pipe and cylinder, and also between the condenser and cylinder, were closed; and through the medium of a tube communicating laterally, the steam which was above diffused itself below the piston, so that on either side it was subject to an equal force. But on the other extremity of the beam there was a weight, which raised the piston up, and the steam all necessarily flowed below the piston. On the communication between the condenser and cylinder being made free, a vacuum was induced, and the steam-pipe being then opened, a stream of steam proceeded to the upper part of the piston, and the movements were repeated as before.

This form of engine was not by any means well suited for the purposes of communicating motion to machinery, in consequence of the inequality of its action, but it served admirably for the purpose to which it had been first applied, namely, that of raising water from mines. It is, however, in a great measure, even for that latter purpose, superseded by the double-acting engine.

Marine Engine.

In the steam-engines employed in the navigation of vessels, there are certain modifications which it is requisite here to detail, and then briefly to point out the lead

ing circumstances connected with the important application of steam.

The most striking peculiarity is the position of the beam in British steamers, which, instead of being placed above, is situated below, chiefly with the view of saving room, and is not single, but two, one at either side of the cylinder. To the upper portion of the piston-rod there is a cross bar, which is placed transversely across the cylinder, at right angles to the long axis of the ship, or from starboard to larboard, in nautical language. From the extremities of this transverse bar, rods stretch down, connected interiorly to the termination of the beams, moving on pivots at both their connections with the cross head and beams. The other extremities of the beams are attached to a cross piece, on the centre of which the rod is fixed by which the crank is worked. The shaft of the paddles is firmly connected to this crank, so that it is worked along with the rod. In small vessels, only one engine is usually employed, but in vessels of considerable tonnage there are two, and their action is so adjusted, that while the one is at its fullest strain the other is in the reverse condition. In this manner the motion of the wheels is preserved uniform and equal. These forms of engine are usually called condensing, the steam being worked at high pressure, and then condensed, an object which is very readily accomplished in consequence of the abundance of water.

From the peculiar structure of these engines, they emerge considerably above the level of the deck, and consequently they have been designated by the apt name of the *steeple engines*. They are worked with air-pumps and condensers, and, as in the other marine engines, there is no fly-wheel. The chief advantage they possess is the small space they occupy, and thereby not only afford room for more merchandise, but further save the great weight necessarily incurred where the beam is employed.

Another modification adapted to the steamboat, by which it is rendered unnecessary to have the beams and its appendages, is that proposed by Mr. Witty, and called the *vibrating engine*. The object is to obtain a circular movement from the vertical motion of the piston-rod. This is effected by the cylinder being suspended on an axis at its middle, so that it has an alternate movement forwards and backwards, vibrating in a manner analogous to a beam on its axis. In this manner there are two distinct movements of the piston-rod—the common one upwards and downwards, and this lateral movement, in which it is immediately connected with the crank.

In this form of the engine, the axes on which the cylinder moves are hollow tubes, one being the steam-pipe by which the steam passes to the cylinder, and the other being the eduction pipe, by which it is transmitted to the condenser.

There is a peculiarity in the arrangement of the marine boilers, which it is necessary here to point out. This consists in the process of *blowing out*, as it is technically named. In sea-water there is a considerable quantity of saline matter, about three per cent., which, accumulating in the boiler, not only retards the process of boiling, but is apt to give rise to explosions. To obviate these imperfections, hot water is permitted to escape freely from the boiler at stated intervals, and as the discharge takes place from the interior surface, the greater portion of the saline matter is carried off. In this mode, a very serious obstacle was effectually removed, but this was not done but at a considerable expense, the loss being estimated at nearly 1-54th part by Mr. Tredgold. For it is apparent that an immense quantity of heat must have been lost in the warm water employed for this purpose, and not subsequently converted into steam.

A very ingenious method has been invented by Messeurs Maudsley and Field, which preserves a uniform standard of the quantity of salt in the water of marine steam-boilers. This is effected by means of pumps, called *brine-pumps*, which are worked by the engine, and remove from the boiler the strong solution of salt and water. These pumps discharge so much salt, combined with the small quantity of water, as the feed pumps supply to the boiler, so that the quantity of salt remains almost always the same. Further, before this hot brine is discharged into the sea, it passes through a tube included in another, which is the feed-pipe, supplying the boiler from the sea, so that the greater amount of its caloric is imparted to the water, and it is reduced to nearly 100 degrees before it is thrown out.

The paddle-wheel by which the steam vessel is propelled has undergone many modifications, for, in the common mode in which the flat boards or float-boards are disposed, they both enter the water obliquely and leave it obliquely, occasioning a considerable loss of power; for it is apparent that their greatest effect must be when they are nearly in a vertical position. The complex nature of several of these wheels, proposed as substitutes, prevents their employment. Latterly, the Archimedean screw has been adopted in several vessels with great prospect of success.

In Great Britain the engines adopted are those called condensing, and they usually work with a pressure of about forty pounds on the square inch. In America, the high-pressure engine is generally used; and Stevenson states he was in a vessel on the Ohio, where the common pressure used was 138 pounds on the square inch.

High-Pressure Engines.

The steam which is produced at ordinary temperatures and pressure, cannot produce any motion if opposed to the atmosphere, as it merely possesses a force equal to it. Hence to give it any power, the piston by which it acts must be pushed towards a vacuum. To accomplish this, additional apparatus is requisite—all, in short, that is used in condensing the steam. If we desire, therefore, to have an engine of as simple and light a construction as possible, the bulky condensing apparatus must be dispensed with. The steam must be generated at a higher temperature. Steam of greater elastic force must be employed. Before this can act, it must first overcome the resistance of the air; and it is only the pressure it has in excess over one atmosphere that will exert any efficient power. These engines, from the kind of steam which they use, and the absence of the condensing apparatus, are usually denominated *high-pressure*, or non-condensing engines. High-pressure engines are now made in various small sizes, and of exceedingly neat workmanship, to impart motion to machinery of limited extent. Those made for turning coffee-mills, of which we give a sketch in fig. 6, are of a handsome compact form, costing from £20 to £50, without the boiler.

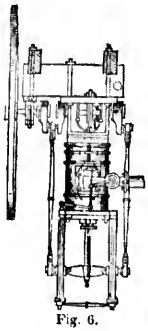


Fig. 6.

The mode of generating the steam in high-pressure engines, with its action upon the piston, is the same as in the other; there is one difference, however, that the pipe from the cylinder leads at once out into the open air, where the coolness of the atmosphere soon condenses the steam into a white cloud or mist. These high-pressure engines are more dangerous, on account of the great force of the steam in the boiler, which is consequently very apt to be burst; but with a reasonable degree of care, and an attention to the valves, no explosion need be anticipated. The pressure with which those in ordinary circumstances work, varies from 30 to 45 pounds on the square inch

The employment of high-pressure engines affords an opportunity of heating premises with the waste steam.

Rotary Engines.

This engine specially consists in the application of the steam disengaged from a boiler, so as to produce directly a continuous circular movement. In it there are no cylinder and piston, no beam and crank; in short, there is merely the boiler to disengage the steam, and the object to which it is to be applied. The most simple form of this is the engine formed analogous to the æolipile. A pipe rising vertically from a steam boiler ends in a horizontal arm moving freely round the pipe. This arm or horizontal tube has apertures, in the same manner as in the æolipile, at the opposite sides from which the steam escapes, urging the horizontal pipe forwards in a course the reverse of that in which the steam is disengaged. Mr. John Ruthven of Edinburgh has several years been engaged in making engines of this simple nature; one of these which has come under our notice works with great power, the pressure being from 30 to 70 pounds on the inch. The length of the arms is five feet, the breadth five inches and a half, and the apertures from which the steam issues are one-fourth inch in diameter. Mr. Ruthven has, as he informs us, sent a great many to England and abroad. One of 20 horse-power has been working at a coal-pit at Stovely, in Yorkshire, where it raises above a ton of coal 55 fathom in less than a minute, the engine never requiring to be stopped or reversed. Sixty horse-power is also applied at a short distance from it, working a rotary fan-blast for smelting iron ore; they work night and day, and have done so for upwards of six months. The Rotary fan employed for such a powerful blast is the invention of Mr. Ruthven's son. Several of the rotary engines are in London, one near Bristol, in Newcastle, Thirsk, Oatley, Kilmarnock, &c., &c.

Locomotive Engines on Railroads.

The form of engine adapted to the railway differs from those already described, these being stationary or fixed in large vessels, while here the smallest bulk possible is essentially required, at the same time as little weight as convenient. Accordingly we find, that in the arrangement of these engines, all that apparatus is rejected which is intended for condensation, and therefore high-pressure steam is used.

In the arrangement or disposition of the parts of the boiler and engine, there are certain peculiarities which require to be described It is necessary to premise, that the great object is to effect as speedily as possible the conversion of a large quantity of water into vapour. This is accomplished by arranging the boiler in a peculiar manner. It is not one large mass, as in the marine boiler, or land boiler, with a great quantity of water in the centre, but an oblong cylinder, through which are disposed a vast number of brass tubes of a cylindrical shape, amounting to about ninety in number, arranged horizontally. These tubes communicate with the furnace, and the heated air passes through them as it proceeds to the chimney, in which manner an immense quantity of the caloric is applied to assist in the evaporation of the water; so that the boiler might, nevertheless, be considered merely the same as the common one, but with the chimney subdivided into an immense number of small tubes passing through it to the large vent hole or grand chimney. These tubes were suggested by Mr. R. Stephenson in 1829, and constituted a great advance in the efficiency of the locomotive steam-engine.

In the sketch, fig. 8, is given a general exterior view of a locomotive, and in fig. 9 a longitudinal section of the apparatus. The boiler is seen forming the great bulk of the engine; its form is cylindrical, being about three feet in diameter, and eight in length. The numerous tubes, as they proceed through this part of the apparatus, are seen in transverse section in fig. 7, and longitudinal section, fig. 9. At the front of the engine is the smoke-box, terminating in the chimney above, and below, there is the steam tube, and the cylinder and piston, which lie horizontally (A). At the back of the engine is the fire-box, almost completely surrounded by water, and immediately behind this is the railed space (P) on which the engineer stands. On the upper surface of the engine, proceeding from the hind part forwards, there is the steam whistle (X), by which notice is given of the approach of the engine. A little

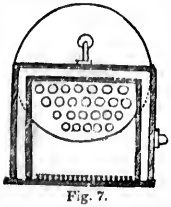


Fig. 7.

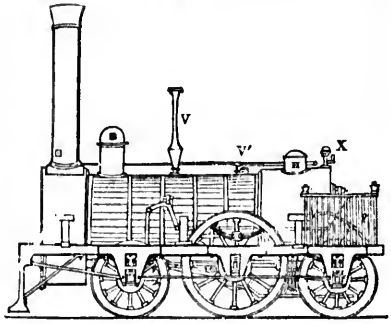


Fig. 8.

anterior to it is the man-hole, by which the boiler can be cleaned, and such repairs made as are requisite. Still farther forwards, we arrive successively at the two valves (V' V), by which the safety of the boiler is secured. The first (V') is always under the control of the engineer; but the second, nearer the chimney (V), is loaded higher, but completely shut up. A round spherical eminence (B) is then perceived immediately behind the chimney, called the *separator*, in which the steam gathers before it is conveyed by the tubes to the cylinder. The cylinders (two in number) are placed below the chimney, and lie immediately before the front wheels (A, fig. 9), and the steam passes to them by the steam pipe (S) into the two cylinders, whence it escapes afterwards into the chimney. The reason why this tube rises so high in the large chamber is, that no water may descend down to the cylinder, which might likely arise from the agitation the water suffers from the motion. At the point where the steam tube in the hot-air chamber meets the connecting pipe with the boiler, a regulator is placed, which can be worked so as to increase or diminish the flow of steam.

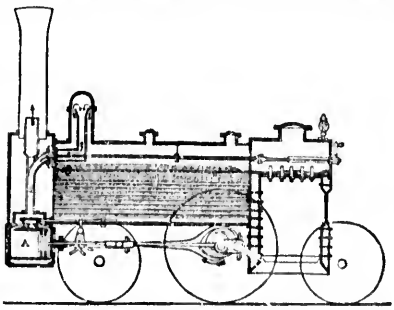


Fig 9.

The steam, as it escapes from the cylinder by two pipes, meets in the common tube, and rushing upwards into the chimney, is in part condensed, and mainly contributes to the draught of the chimney, which otherwise would be totally inefficient to work the fire.

From the great number of the tubes which fill up the boiler, the locomotive engine is not attended with much danger in bursting; for these tubes being weak, compared with the external casing of the boiler, yield readily on any unusual increase of the elastic force of the vapour; the consequence is, that the fire is put out gradually. When one yields, a plug of wood is introduced, which is generally sufficient till the end of the *run*.

The eccentrics for working the valves, and allowing the steam to gain either side of the piston, are fixed to the main crank axle. Sometimes there are two pair of eccentrics, the additional one being for the movement backwards, when the engine makes a retrograde movement. The size of the steam cylinder is about twelve inches' diameter, and eighteen inches' stroke. The driving wheels are usually six feet diameter; and some of ten feet diameter have been tried on the Great Western railway.

The engine is always attended by a tender, in which the coke and water are conveyed. The mode in which the different coaches are arranged may be seen in the article CONVEYANCE, where a train is figured with the engine and tender.

The power of a locomotive is estimated by the quantity of water which the boiler can convert into steam within a given time. Between 70 and 80 cubic feet is the average amount; but in the Bristol railway so much as 200 cubic feet are evaporated within the same time. The quantity of fuel consumed in Stephenson's engine is about a quarter of a pound for every ton per mile.

Horse Power.

In forming the estimate of the power of a steam-engine, it is usual to refer to horse power as a standard. Different values have been given of the power of a horse;* but that generally adopted is, that it can raise a weight of 33,000 pounds one foot per minute, and therefore a steam-engine, capable of executing that work, is rated at one horse power. On a railway, this power is considered equal to transport 400 tons 1 mile per day; or a horse draws 200 pounds at the rate of 2½ miles in an hour, continuously, over a pulley. The evaporation of a cubic inch of water, when converted into steam, affords a mechanical force capable of raising a ton one foot high. Fifteen cubic inches of water, therefore, when converted into steam, are equal to the power of one horse per minute, or 900 cubic inches per hour for each horse power.

To evaporate this, from 7 to 12 pounds of fuel are required in the same time (one hour); but in marine engines, the quantity consumed is about 8 pounds; the proportion of fuel they consume being as 2 to 3, compared with other engines.

Engineers possess rules for calculating the elastic force of steam and power of engines. The following may give an idea of the method of calculation:—

To find the power of an engine, multiply double the length of the stroke† by the number of strokes per minute, and we get the velocity of the piston per minute. If the engine works expansively, the mean effective pressure must be found. Multiply the square of the cylinder's diameter in inches by the mean effective pressure on the piston in pounds on the square inch, and by the velocity of the piston, point off these figures, and divide the product by 42, and the quotient will express the number of horses' power. Let the diameter of the cylinder be 36 inches, the length of stroke 4 feet, the number of strokes per minute 24, and the mean effective pressure on the piston 4 pounds per second inch, then

8 Feet + 24 = 192 per minute.
Diameter, 30
36
216
108
1296
Mean pressure 4 pounds.
5184
Velocity, 192
10368
46656
5184
42)995328(23·7 horse power.
84
155
126
293

*The *medium* power of the horse is rated at 22,000 pounds raised one foot per minute: but 33,000 is the standard applied to the steam-engine.

†The length of the stroke of an engine implies the space moved through by the piston in its ascent and descent, and consequently is equal to one complete revolution of the crank shaft; hence the reason why the length of the stroke must be doubled.

History of the Discovery.

It appears, by careful examination of the records of history, that the action of steam for producing motion (though not then proposed to be applied to practical purposes) was known as early as 130 years B.C. This was produced by an instrument denominated an *æolipile*, described by Hero of Alexandria, of which a figure is annexed, and which may be considered the original of the steam-engine. The æolipile is formed by a globular metallic vessel, which rests on pivots, at and where it can revolve with perfect facility. Two tubes proceed from this ball at right angles to the pivots, shut at the extremities, but with a small aperture at the side, whence steam may escape. The pivots are the extremities of the tubes connected with a boiler below, as marked in the sketch. On the boiler being heated, steam passes by the pivot tubes (C B) into the cylinder, from which it issues by the little aperture (F) at the side of the cylinder tube (E). As the steam escapes, it rushes out with great force, and as it acts on the side opposite to the aperture, it forces it and the cylinder to move round in the contrary direction. One tube will suffice. The same action may be shown even in a more simple manner, as is often done by glass-blowers. A small glass globe is formed, and two arms are attached to it, which are cylindrical tubes. In the globe a quantity of water is introduced, and on applying heat below, the same action takes place. It is of course necessary that the globe should be properly supported.

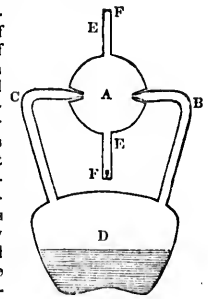


Fig. 10.

The next notice of steam power worthy of our attention is in the seventeenth century. In the year 1663, a work was published by the Marquis of Worcester, named, in the language of that period, "A Century of the Names and Scantlings of such Inventions as at present I can call to mind to have tried and perfected." The following extract, describing what he terms a "fire water-work," seems distinctly to convey the idea of a steam-engine:—"An admirable and most forcible way is to drive up water by fire, not by drawing or sucking it upwards, for that must be as the philosopher calleth it, *intra sphæram activitatis*, which is best at such a distance. But this way *hath no bounder* if the vessel be strong enough; for I have taken a piece of a whole cannon, whereof the end was burst, and filled it three-quarters full of water, stopping and screwing up the broken end, as also the touch-hole, and making a constant fire under it; within twenty-four hours it burst, and made a great crack; so that, having a way to make my vessels so that they are strengthened by the force within them, and the

one to fill after the other, I have seen the water run like a constant fountain stream forty feet high; one vessel of water, rarefied by fire, driveth up forty of cold water. And a man that tends the work is but to turn two cocks, that one vessel of water being consumed, another begins to force and re-fill with cold water, and so successively; the fire being tended and kept constant, which the self-same person may likewise abundantly perform in the interim between the necessity of turning the said cocks."

In 1698, Mr. Savery, or Captain Savery, obtained a patent for a steam-engine, which was the first introduced to raise water. The principle of his plan consisted in injecting steam into a vessel connected with a vertical pipe, dipping into the water to be raised, and then condensing it by cold water, so as to form a vacuum, or at all events a space in which there is vapour of very feeble elastic force. By the pressure of the atmosphere, the water was then driven up until it attained a height proportionate to the pressure of the atmosphere, diminished by the force of the uncondensed vapour. By a peculiar but a simple disposition of the valves, the return of the water was prevented; but as the water could not in this manner be elevated higher than 26 feet (64 feet by force of steam), the plan was not adopted to any extent.

The next decided and most important improvement which took place in the progressive advance of the steam-engine, was that of having a piston introduced into a cylinder, and when it is at the bottom, directing a current of steam so as to raise it, which is to be condensed by being cooled. A vacuum is thereby produced, and the pressure of the atmosphere forces the piston down to the bottom of the cylinder. A rude and imperfect idea of this plan was suggested by Papin (a celebrated Frenchman, who discovered the Digester, and invented the safety-valve) about 1690, but laid aside. Engines were invented and constructed on this principle in the year 1713, by Newcomen and Cawley.

The engine so constituted is commonly called the *Atmospheric Engine*, because the power is derived from the pressure of the air, the steam being used merely to form a vacuum against which the atmosphere is to act. As this engine constituted a very important era in the history of steam, a short account, with a diagram of it, is subjoined, more especially as it shows in very bold

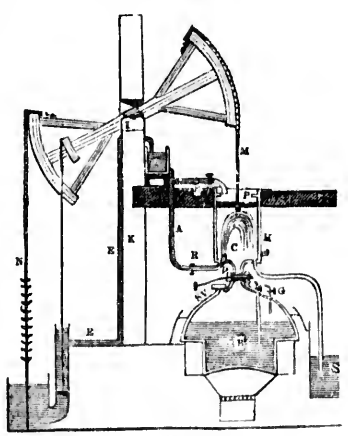


Fig. 11.

contrast the many and great advantages that resulted from the application of the genius of Watt to the steam-engine. There are three essential parts in the engine—the boiler, in which the steam is produced; the cylinder, in which it is condensed; and the beam, where its movements alternate with the ascent and descent. The boiler (B) is placed over a proper furnace, and built in with bricks. The summit of the boiler has a pipe or tube which communicates with the cylinder (C), situated immediately above. The communication between the cylinder and the boiler is protected by a valve (V), called the *regulator*, or regulating-valve, so that the admission of steam may be regulated at will. The boiler is provided with gauge-cocks (G G) as already noticed under the head of *boiler*, and also with a safety-valve (S V), which is not loaded to any great extent, as the engine works at a low pressure. The cylinder, which is placed above, is made of cast-iron, and nicely bored, so as to permit the free working of the metallic piston, but at the same time to prevent the access of air or steam. The piston (P), in short, works like the piston of a common syringe. There are four apertures in the cylinder, while it is also open at the summit. There are, first, that marked V, the valve of communication between the boiler and cylinder; second, that at the left inferior angle in the opening of the pipe (A), which transmits the water for condensation, armed with the stop-cock (R), named the *injection-cock*. This pipe leads from the cistern (C), which is kept constantly supplied with cold water by the action of the small pump attached to the beam, raising the water and carrying it along the tube or water-pipe (E).

At the opposite angle below H, an aperture is observed, being the commencement of the eduction pipe, by which the water injected for condensation is removed to a cistern beneath. This pipe is conveyed a considerable way down into the cistern, and is protected with a valve at its extremity, opening outwards, so as to permit free passage of the water from the cylinder, but none to regurgitate from the cistern. The fourth aperture opposite the opening of the injection pipe (H) is also supplied with a valve opening outwards. It is commonly known by the name of the *blowing-valve* or *snifting-valve*. It is through this valve that any air in the cylinder is expelled before the engine starts.

On a large support (K) a beam (I) is placed transversely across, which moves on an axis at I. This beam has one arched head at either extremity, to both of which chains are attached. On the one immediately above the cylinder the chain is continued down to the piston-rod (M), into which its fixed, so that, as the piston ascends and descends, there will be a similar movement of the arched head of the beam. To the other end the chain is connected with the pump-rod, by which the water is to be brought up. But the pump-rod is made heavy, so that it naturally draws down this extremity, and elevates the piston-rod.

The mode in which this engine is worked is the following:—The fire being properly raised and steam freely formed, the valve (V) is opened, to allow the entrance of the steam. The snifting-valve (H) is now forced open, and the air escapes along with the steam, until the cylinder is full of steam. The regulator-valve (V) is now shut, and the stop-cock (R) on the pipe A being opened, the cold water is injected, and condenses on the steam. But as a vacuum is effected by the condensation of the vapour of the water, the pressure of the air, now acting with a force equal to fifteen pounds on the square inch on the surface of the piston, carries it down to the bottom of the cylinder, and consequently raises the other end of the beam to which the pump-rod (N) is attached. In this manner the water is raised from the mine; and by a repetition of the movements already noticed, a constant discharge of water results. There were not a few difficulties or impediments in the free working of this engine, one of the most laborious of which was the incessant attendance of a person to open

and shut the stop-cocks alternately as it was required. This was accomplished by catches (scoggans) worked by the beam, or strings connected with the lever of the valves and the beam—an invention of a boy, Humphrey Potter, to avoid the trouble that constant attendance on the levers demanded. By means of a plug frame fixed to the beam, invented by Beighton, the engine was made to work the valves with great regularity—a most important practical advance in making the steam-engine work itself, and adjust its own valves. The analogous part of this machinery in the modern double-acting engine is to be observed in the eccentric.

This, the atmospheric or Newcomen's engine, had many and very striking advantages over all others previously proposed. It may, indeed, be considered the basis of the engine subsequently modelled by Watt. But there were very serious defects in it, which the reader will in some measure be acquainted with from the history of Watt's engine. It is here sufficient briefly to enumerate them. Much steam must, then, be lost during the process of the heating of the cylinder after each condensation; for it must always at least be raised to the temperature of the steam that can, as such, continue in it, and be in any degree efficient; and on the other hand, the cold air which follows the descent of the piston must necessarily withdraw a considerable portion of heat. By the calculations of Watt, it was estimated that *three* times as much steam was expended in this manner as would have been equal to work the engine—a loss, therefore, equal to 75 per cent. Nevertheless, this, as has been correctly observed, "was the first really efficient steam-engine; that is, the first engine which could be applied *profitably* and *safely* to the most important purposes for which such machines were required at the time of its invention."

In the further history of steam-engines, we fall on the era of Watt, the atmospheric engine having been very extensively used for a period of nearly one hundred years. The modifications it afterwards underwent have been sufficiently explained in the history of Watt's engine, and it is therefore unnecessary to extend these observations further.

MINING—METALS—COAL—SALT.

The objects upon which mining industry is exerted are, as is well known, metals, coal, salt, and various kinds of earths and other substances employed as drugs, or in different departments of the useful arts. Confining our paper to the mining industry of the British islands, which are rich in mineral products, we shall, in the first place, treat of the metallic class of minerals, such as tin, copper, iron, lead, &c., and afterwards of coal and salt.

METALLIFEROUS DEPOSITS.

Metals are not distributed accidentally and promiscuously in the earth, nor do they exist, with rare exceptions, in a pure and unalloyed state. They are found in connection with various earthy impurities, and in different states of chemical combination with other mineral substances. Such deposits are called *metalliferous*, or containing metal. The chief forms in which they occur are veins, beds, and fragmentary deposits.

Fragmentary deposits are associated with many of the superficial beds of sand and gravel which occur in the valleys of mineral districts, consisting of the detritus of the neighbouring metalliferous mountains, which has been washed down from them at remote geological epochs. These mineral accumulations are not equally and indiscriminately mixed up with the sands and alluvial matter, but the excess of their specific gravity has occasioned their separation into distinct layers, commonly found towards the bottom of the alluvium. It is well known that minute grains of gold, or gold dust, are interspersed in this manner with the sands of the Brazils; and it is estimated that the gold derived from the washings in the chief province of the Brazilian gold district produces about 2800 pounds of fine metal—worth nearly one million of pounds sterling. It is less generally known that there exist three small gold washing stations in the county of Wicklow in Ireland. Little streams running from the mountains are slightly diverted into reservoirs, where the particles they deposit undergo divers washings in wooden bowls, and among the purified remains are discovered rare grains of gold. On the occasion at which we visited these washing places, the produce of the morning's labours at one of them was about six shillings worth of gold.

Tin ore is also found in Cornwall, in deposits generally considered alluvial, mixed with the debris of different rocks, and often covered with an alluvial bed. Repeated washings, by means of running water, being the chief process by which such ore is separated, the name of *stream work* is commonly applied to this method of obtaining it. The water being excluded from one of the branches of Falmouth harbour, a bed of rounded masses of tin ore, from two to ten feet thick, was found fifty feet below a bed of alluvium—£50,000 was made by this discovery.

Beds.—By mineral beds are meant the metalliferous strata which sometimes alternate with earthy strata. Mineral beds are for the most part horizontal, or slightly inclined, and occur in what are geologically termed primitive and secondary countries, of various elevations. The ores of copper, iron, and lead, occasionally occur together in beds in primitive mountains, and sometimes small quantities of gold and silver are mixed with them. Cobalt and certain ores of mercury also occur in beds. Almost all the ores of metals in the great mining district of Sweden are found in beds in primitive mountains. Lead, zinc, and iron ores, occur abundantly in beds in secondary mountains.

In England, the principal metal whose deposits assume the form of beds is iron, in the state called ironstone. This alternates in thin beds with beds of coal, and frequently with beds of limestone. Thus the metal, and the means of heating and fluxing it, are most fortunately combined in one and the same locality. One of the most important mineral productions of Scotland is the thin bed of ironstone called *black-band*, which is not known to exist beyond a space of from eight to ten square miles in the mineral district around Airdrie, near Glasgow. The true black-band is found from fifteen to sixteen fathoms below the splint coal, and is only from fourteen to eighteen inches in thickness. The "output" from Rochsolloch is 4500 tons per month; and the an

nual it come to the proprietor amounts to about £12,600 per annum, on a property which, if let for tillage, would yield only a few hundreds a year. Some of the ironstone beds, as in south Staffordshire, consist of pulverized matter, with rounded boulders of ironstone distributed through it; and some few contain flattened spheroids, or roundish masses. The beds of ironstone being commonly situated at a much less depth, and being more readily arrived at than veins of metals in general, the pits are both shallow and simple, and therefore require no particular notice. In this country they are worked principally in south Staffordshire, Shropshire, south Wales, and the eastern and western mineral fields of Scotland.

Veins are the principal forms in which metallic ores are distributed throughout the globe. A description of the veins of Cornwall will almost suffice for those of every other country, as the differences are of a comparatively unimportant character to the general observer. A vein may be said to resemble a deep cleft or crack in a clayey field, which has been subjected to the exhaling influences of the hot sun for some time. This cleft, whatever may be its depth, must of course have a direction under ground, either slanting or straight; and if we suppose it filled with metallic ore, we form the idea of a vein, or, as it is provincially termed in Cornwall, a *lode*; if we suppose the cleft filled with any other stony substance, we can imagine what is called a non-metalliferous vein, of which there are many, sometimes pursuing their own exclusive courses, and at others intersecting the metalliferous veins.

The direction of the lodes is by no means accidental, but nearly determinate. They usually run east and west, and dip or underlie either towards the north or south; while the non-metalliferous veins, which run north and south, dip either towards the east or west. The cases in which metalliferous veins assume a north and south direction are few, and chiefly foreign. It frequently happens that the metalliferous lodes, as we have said, cross each other; and, as a leading fact, the intersection of two lodes at a small angle is productive of good ore. Should, however, a copper lode pass through a tin lode, the copper lode invariably divides the tin lode, and generally heaves it out of its course, to the frequent perplexity and loss of the miner. All mining experience of a general character is, however, sometimes set at defiance; for, in the small space of one little hill, instances may be found in which veins of almost every description dip or underlie in almost every possible direction, traversing each other in such a manner as completely to baffle the miners; but it is an ascertained fact, that there are seldom or never, *in the same district*, two *series* of metalliferous veins running at right angles to each other. As a tolerable average, we may assume the direction of the Cornish lodes to be about four degrees south of true west, and their dip or inclination to average sixty or seventy degrees from the horizon. Taken on the whole, the lodes appear tolerably straight both in direction and inclination, but when examined in detail, they exhibit almost continual curvatures and irregularities in both respects, although these flexures would seem to be projected on certain lines which manifest considerable constancy.

The length of no one lode has yet been satisfactorily traced. Some of them, indeed, have been followed for two or three, or even four or five miles; but no instance has occurred in which a vein has been known to stop nor has the miner ever yet seen the bottom of one, although there are several mines in Cornwall upwards of 1000 feet in depth from the surface, and two or three about 1300 feet deep. The lodes differ exceedingly in respect of width, in which, indeed, they vary from a mere line to forty or fifty feet. On the average, they may be assumed to be three feet and a half wide. Lodes of from one to three feet in width are usually less intermixed with foreign and troublesome substances than those which are wider. A vein of tin in a mine called Whealan Coates was only three inches wide, and yet proved so rich as to be worth working. Some of the veins containing copper in Herland mine did not exceed six inches in width; and after continuing this thickness for a few fathoms, eventually passed away east and west in mere strings; but they yielded copper of a very rich character. In the next hill there was also a very productive copper vein of from twelve to twenty-four feet in width.

The compositions of the lodes or veins are as variable as the nature of the rocks through which they pass. By far the greatest portion of them, however, is earthy matter, of the nature of the contiguous rock, but also containing large intermixtures of quartz. These ingredients occasionally occur in separate veins, but for the most part they are mingled without regularity or order, and throughout them are dispersed the metallic ores. Sometimes they are aggregated very thickly, and very generally occur in large irregular lumps or patches called *bunches*, connected with each other by small veins of ore. At other times the ore is very sparingly sprinkled through the whole of the earthy matter of the vein, and in some rare instances it forms the larger part of its contents. The sides of metalliferous veins are generally very determinate, being covered by a hard, dark-coloured crust, called by the miner the *walls* of the vein.

We have noticed that there is a second series of veins, called non-metalliferous veins, which run north and south; that is, nearly at right angles to the metalliferous lodes. When these veins are chiefly composed of quartz, they are locally denominated *cross-courses*, and when consisting mostly of clay, they are named "flucans." Their general direction, when accurately traced, is about south-east and north-west. Their dimensions are variable, being perhaps on an average about two feet; their dip, too, fluctuates, but, as a general rule, it is greater from the horizon than that of the lodes. The clay with which the flucans are filled invariably partakes of the same character as the contiguous rock. Tin and copper ores are occasionally found in small quantities in the cross-veins, and in two or three instances silver and its ores have occurred in them to some amount. The chief metallic produce, however, of this class of veins, is lead ore; but this they seldom yield in the neighbourhood of lodes which have been productive of other metals. Indeed it is, as we have said above, a general law in Cornwall, that two series of productive metalliferous veins, at right angles to each other, are very seldom or never found in the same district. Both the lodes and the cross-veins ramify and divide; and whilst the part which in one place is large will sometimes, within a short distance, dwindle and die away, the portion which is small, where the other is rich, will often, within a small space, enlarge and become productive.

As these two series of veins, the lodes and the cross-veins, run at right angles to each other, they of course frequently meet and intersect. In a few instances the lodes traverse the cross-veins, but in far the greater number of cases the cross-veins cut through the lodes. Occasionally, the cross-vein simply intersects the lode, but more generally displacements, provincially termed *heaves*, attend their contact. These heaves, although usually only amounting to displacements of a few feet or fathoms (a fathom being equal to six feet), yet in some cases turn off 20, 30, or 40 fathoms, and in one instance to the extent of 72 fathoms. If, for example, a cross-vein, in its north or south course, meets with a lode containing copper or tin, the last seems to have been split, as it were, into numerous little branches by the first, which generally pursues its uninterrupted course straight forwards. Another effect, too, of a much more extraordinary kind, is produced by this intrusive cross-vein. In

searching for the tin or copper lode on the other side of this north and south vein, a lengthened period frequently elapses before the fugitive can be discovered. Notwithstanding the experience of the miners, forty years have sometimes passed over, before the search, though carried on with vigour and great expense and labour, has proved successful. It is by no means a simple task for the mining engineer to lay down a law for the recovery of the lode. Instances have been known in which it has been again found 120 or even 450 feet north or south of its original course. The cross-vein will not perhaps generally intersect the lode exactly at right angles, but its inclination to the course of the lode will usually be such as to produce at the intersection an obtuse angle at one side of the lode and an acute at the other side; and it is thought, by the most experienced observers, as well in Saxony as in Cornwall, that the second portion of the lode will more frequently be discovered on the side of the obtuse angle, formed by it with the cross course, than on the side of the acute angle. In other words, on whichever portion of the lode we approach the cross-vein, the other portion will be found towards the same hand, namely, the right hand. There are other kinds of interruption to which metalliferous veins are subject, though far less extensive in their agency than are cross-veins. These are denominated *slides*, and generally consist of clay or argillaceous matter. Their direction is nearly parallel to that of the contiguous lodes, but their dip or *underlie* being either greater than, or opposed to, that of the latter, they intersect them either in a horizontal or more or less inclined direction. Slides are common in Cornwall, and occur also in Mexico and other mining countries.

It is a well known but remarkable fact, that some of the metallic ores lie much nearer to the surface than others. Gold, in the small veins of it which are sparingly distributed through some of the rocks in Brazil and elsewhere, is worked by open cuttings from the surface. Silver is found in some foreign mines at a depth of from two to three hundred feet, while the silver mines of Mexico are of a much more considerable depth. Tin is also found at shallow depth, of which the great lode of the Charleston mines in Cornwall furnish a good example. Lead is usually met with at a very trifling depth, and slightly spotted veins of it are sometimes to be observed in the sides of brooks, and in the rocky channels of rivers. Copper, on the contrary, generally lies deep, and the enormous deposits of this metal found in Cornwall are generally situated two or three hundred feet below the surface. Where tin and copper are found together in the same vein, the tin commonly occupies the upper part, and disappears at the depth at which the copper is discovered. Sometimes, however, the ores of both metals occupy the vein together to a great depth, as at the Poldice mine near Redruth. On referring to the *known* depths to which different metals extend, it will be found that those which commonly lie near the surface, as lead, zinc, gold, and occasionally tin, do not generally penetrate to any great depth; while those which lie deeper, as copper and silver, are worked in the bottoms of our deepest mines. This coincidence may be the result of a natural law, or it may be apparent, and consequent only upon the limit of our experience and knowledge.

Cavities or open spaces frequently occur in metalliferous veins, which may reasonably be conjectured to be such portions of the original fissures as have not, owing to local causes, been filled up in the same manner as the remainder. These cavities are very irregular both in size and form, but yet, in their size, appear to bear some relation to that of the vein in which they are situated. They are probably the secret laboratories in which nature has perfected some of the most beautiful productions of the mineral kingdom. The whole of their interior is generally lined with various substances, often crystallized in beautiful groups of dazzling brilliance. It has been elegantly though fancifully observed, that minerals are the flowers of rocks; and might we not, in pursuance of the same idea, call these cavities the gardens of the mineral kingdom? It is from these open spaces that most of the mineral specimens are collected for the cabinets of the curious and the wealthy.

Situation of Metalliferous Deposits.

Metalliferous veins, and, indeed, metalliferous deposits generally, are found traversing a great variety of rocks stratified and unstratified, and appear to belong equally to formations of igneous and sedimentary origin. Although not confined to that class, they may be said to exist most abundantly in the older and more crystalline rocks, and usually in those bordering upon mountain chains. They are mostly found in those situations where a junction occurs between two contiguous rocks; where different rocks are interstratified, or where they are broken or dislocated by faults and cross-courses. Thus, in Great Britain, the tin and copper mines of Cornwall and Devon are situated in granite and different varieties of slate belonging chiefly to the primary class, and are most productive near the junction of these strata.* Many of the metalliferous deposits of Wales and the north of England, producing both lead and copper, are also contained in slaty rocks, which are generally referred to the grauwacke series. Our great deposits of lead, however, are contained in the lower rocks of the carboniferous series, which is the case in the lead mines of North Wales, of Derbyshire, Yorkshire, and the great lead mine district of the north of England. Above the carboniferous series no metalliferous deposits of any value occur in this country. The metalliferous deposits of Scotland occur in primary and transition rocks; and those of Ireland occur mostly in granite, mica slate, and clay slate, although extending also into the carboniferous series.

The mining district of the west of England may be considered to commence at Dartmoor, and terminate at the Land's End. The surface is gently undulating, the loftiest hills rarely exceeding 1000 feet above the level of the sea, whilst the greater number of them range from 500 to 700, and the plains at their bases are usually from 100 to 200 feet above high water. The highest peaks are for the most part granite, whilst the lower hills and most of the plains consist of various descriptions of slate. The granite may be considered to present six patches of large dimensions, as Dartmoor, &c.; and three eminences of Minor dimensions, in which we include St. Michael's Mount. All the other parts of Cornwall (except the Lizard district, which is composed of serpentine) may be said to consist of slate of various kinds. The granite is commonly coarse-grained, and of porphyretic structure; the slates, in general, partake of the character of felspar, and are of a compact structure when near the granite, and otherwise when at greater distances. Both the granitic tracts and the slates in their vicinity are intersected by veins or dykes of a porphyretic felspar rock, provincially termed *elvan*. These dykes or veins have, in a few cases, been traced for miles, and they pass uninterruptedly through both granite and slate; their usual direction is about 20 degrees south of west, and they are generally several fathoms in width.

The sulphuret of zinc (blende, or the *black jack* of the Cornish miners) occurs very abundantly in the mineral veins of Cornwall, being, however, more frequently associated with the ores of copper than those of tin. The conditions favourable to the production of tin and copper lodes have been favourable also to the appearance of the sulphuret of zinc or blende, which, however, frequently occurs in the continuation of tin or copper lodes, far beyond those localities where the tin or copper can be profitably raised. Viewed on a large scale, blende is one of the most widely distributed ores in Cornwall

while the carbonate of zinc, or calamine, is a very rare one in this district. The sulphuret of zinc is not, however, an ore much worth raising at present for profit.

Cobalt is a rare ore in this district, and does not seem to be accompanied by any marked geological conditions, as far as regards its occurrence in any particular class or kind of rock. The same may be said of bismuth; and nickel is a very uncommon metal too, and has only been found in any workable quantity near St. Austell.

The Silver of Devon and Cornwall has for the most part been obtained from those ores of lead (argentiferous galena) in which its presence has been detected. Silver ores-proper have, however, been obtained in several mines, in lodes or cross-courses in the grauwacke. Such ores have consisted of native or pure silver, and silver in various states of chemical combination with sulphur, arsenic, &c.

MINING OPERATIONS.

Preliminary Proceedings.

When the mineral contents of a spot are entirely unknown, the operations instituted for the discovery of lodes must be founded upon the general presumptions furnished by geological science in connection with mining experience, as mineral deposits usually present no precise traces of their existence at the surface. The first objects of pursuit, in such circumstances, to the Cornish miner, are what he denominates *shode* or *shoad-stones*. These stones are partially rounded and apparently water-worn, and are found on the surface or at very small depths below it. Their mineralogical characters nearly resemble those of the contents of the lodes in the vicinity, of which they are presumed to be portions removed by diluvial action. As, however, the shoad-stones contain tin ore, a careful search for them has been constantly kept up, and their increasing scarcity will probably render this mode of discovery impracticable. When they were uncollected, the examiner might commence marking their presence at any given spot, and then trace them to where they appeared in the greatest abundance, which situation was probably the nearest position of the lode itself. Upon arriving at this place, he would cut trenches, or dig little shafts, to ascertain how far his suspicions were well founded.

Should the precise situation of the vein, whose existence has been ascertained by tracing the shoad-stones, or by any other mode be unobservable, it may be ascertained by opening trenches in the alluvial soil, deep enough to expose the solid rock; their direction being at right angles to that in which analogy, or the position of other veins in the neighbourhood, would render it probable that those in question should lie. Supposing the direction of the vein, and its dip or *underlie*, to be ascertained either by the shoding, and by sinking a few shallow pits upon it, or by previous experience in some adjoining mine, the further exploration may be continued either by sinking upon its course from the surface, or by forming a horizontal passage to intersect it, which is commenced from a valley, or the lowest point in the neighbourhood, and is called an *adit*. This last plan, however, being both slow and costly, is seldom adopted, unless there is a tolerable certainty of its results being highly favourable. The mode of proceeding is in a great degree dependent upon the means and prospects of the undertakers, and upon the commercial arrangements and pecuniary resources of the mining company.

The lode and its directions being discovered by the means above detailed, the next point is to determine the site of the shaft upon some convenient spot of ground. If the shaft is to be sunk in an inclined direction upon the course of the vein, which is frequently desirable, the site is not so circumscribed as when it is to be sunk perpendicularly upon it. In the latter case, the shaft is necessarily commenced upon that side towards which the vein inclines or underlies, and at such a distance from its appearance at the surface (or outcrop) as to cut the vein at a premeditated depth, which may be from ten to thirty fathoms, in accordance with the means of the adventurers, and with their knowledge of the quality and conditions of the lode, the upper portions of which are seldom productive.

The vein being cut, the shaft may be continued either perpendicularly, and through the vein, or obliquely, and in the course of the vein. Should the lode be expected to turn out excellent and profitable, the former plan will be adopted, as it will be ultimately the most advantageous, and will enable a large mine to be carried out. But if the lode is questionable, and the means of the miner the same, the latter course will be proceeded upon, as it is far the cheaper one as well as the speedier.

In driving the second and the succeeding levels, it is clear that the further we proceed from the shaft in each direction, the greater will be the closeness of the air, and the more essential will ventilation become. It is then that small shafts, called *winzes*, are sunk. Thus a communication is opened between all the levels, each one of them possessing winzes opening upwards from itself to the next superior level, and also others opening downwards from itself to the next inferior level, by which means a double communication with the atmosphere and every level is effected, and an ascending and descending current of air produced.

But in addition to their utility for the purposes of ventilation, winzes are equally necessary to the working out of the ore from the lode, and, indeed, are advantageous in trying its value. Unless little or no ore has been discovered upon the opening of the first level, winzes will be commenced at a very early stage of the mining operations; and when the ore is found to be tolerably good, they will be opened at intervals of twenty or thirty fathoms in each level. Their position will be especially determined, so as to prove the richest and most promising parts of the vein, and to avoid those hard and unproductive portions which may be supposed to be unworthy of exploration. As far, too, as it can be effected in accordance with these views, the position of the winzes will be such as that each of them may come about mid-way between the nearest two above it. The system of works, therefore, by which the lode is explored and the mine established, is not unlike a system of masonry, if the horizontal joints of the stone work be supposed to represent the levels, and the vertical joints the winzes. When, by these arrangements, the lode has become divided into a number of solid rectangular masses, as just described, the mine will have been brought into an effective state of working, and parties of men will be set to raise ores from all the most productive points. Where the vein is not very hard and stubborn, the ore may be broken down with the pick only, but it is generally necessary to blast the rock with gunpowder, by which mode large quantities of ore are detached at every "shot." In working the ores either by the pick or the blast, the men usually work upwards, from the upper part of one level towards the bottom of the one above it; and the excavations are so arranged that the ore may readily fall down to the level below them, whence it is carried in train wagons to the nearest point of the shaft, and is thence raised to the surface.

Tools—Excavating Processes.

The principal tools used by the miners are *picks* for working the rocks, and *borers* and *mallets* for making the holes for blasting. These are often sent up and down in the bucket in which the ore or rubbish is drawn to the surface, but the miner very commonly carries with him from ten to twenty pounds' weight of tools. A constant necessity exists for hardening and sharpening these tools

which is done at a smith's shop above ground, though it would seem more advantageous to establish a forge under ground, as has been done in one Cornish mine only, but with considerable economy; such subterranean forges are more common in Ireland, two having been in use for several years in a mine in the county of Cork.

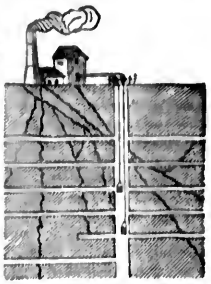
The great body of the miners under ground are employed in excavating the rock, whether for the sinking of shafts, the driving of levels, or the removal of the pieces of ore from the lode. These operations require, in most of the mines, the almost constant occupation of the explosive force of gunpowder. A great part of the work, therefore, consists in "beating the borer;" that is, driving an iron cylinder, which terminates in a wedge-aped point, by blows with a heavy hammer (mallet), hilst it is turned by another hand. The necessity or advantage of making the hole in a particular direction, often constrains the miner to assume every variety of posture in carrying on his work. When the rock has been bored to a sufficient depth, the charge is introduced, and rammed down with a *tamping-iron*, a particular clay being used as wadding, and a certain length of safety-fuse keeping up the communication with the powder; fire is applied to this, and the miner retires till the explosion has taken place. It is [illegible] that the safety-fuse misses fire, but such accidents [illegible] then arise from the impatience of the miner [illegible] to an imprudent examination of the fuse when [illegible] slowly than usual, which may occur from [illegible] burning down. Safety-fuse is a kind of cord, into the texture of which gunpowder is introduced, and which is afterwards covered with a coating of a bituminous nature—the process being secured by patent. Previously to its employment, frequent accidents occurred to the eyes of the blasters, but such calamities are now rare in comparison. The form of the tamping-wedge, and the metal of which it is made, are of great importance, more especially the latter, as it is obvious that any metal, the friction of which shall produce sparks, is excessively dangerous. In the great lead mines of Northumberland, we lately found that the use of copper prickers and beaters has been adopted to some extent in blasting, but certainly not to so great an extent as necessary. Wherever copper tools have been employed, no accidents have occurred by sparks flying from the *needle*.

The pick is a very useful tool, and one very much employed by the miner both in working in the rock and in breaking down ore, where the ground is not so hard as to require blasting. It resembles a common pick-axe, but is smaller and more convenient, the iron head being sharp and pointed at one end, and very short and hammer-shaped at the other, a form which peculiarly adapts it for under-ground employments. The wedge, or *gad*, made of wrought iron, and often with curved sides, is sometimes used, together with the pick. The borer, or *jumper*, is an iron rod or circular bar, commonly about two feet long, and steeled and formed into a flat sharp edge at the end, which is driven into the rock, as before said, while a person turns it round, so as to expose the cutting edge to fresh surfaces of rock; the pulverized matter is drawn out from time to time by a *scraper*, and the charge is introduced when the hole is fully perforated.

Working.

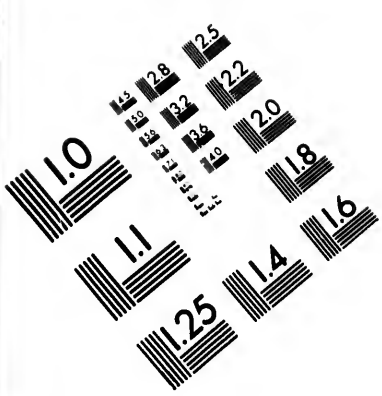
A mine in a complete working condition exhibits a most extensive series of operations, in connection with the shaft, the lifting and descending by ropes and pulleys, the drainage, the excavation, the ventilation, &c. At the bottom of the shaft, and in the various stages in which the excavations are going on by the miners, in their attempts to follow the lodes, the operations are on a scale which seldom fails to surprise the stranger.

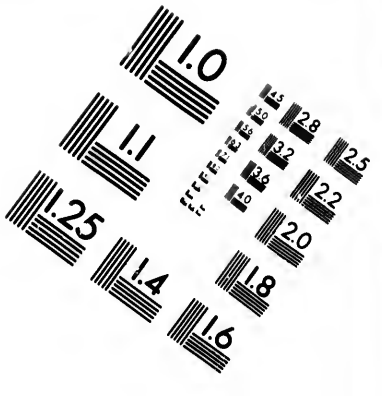
It is judged most expedient in mines, more especially in those worked upon a large scale, and for a continuance, not to take out all the ore which could be immediately got at, but to leave it here and there, to be worked as the general prospects of the mine may require. It is, in fact, in such establishments, desirable to regulate the quantity of ore raised to a uniform rate, and therefore the processes of excavation or *opening ground* will generally either keep pace with or even exceed the amount of exhaustion. Thus a portion of the ore laid open may always be held as a reserve fund to regulate the returns of the mine during periods of temporary depression, or when only poor and unproductive ground may be bared by the works of discovery. The ores thus left in [illegible]s places are often termed the *eyes* of the mine; [illegible] it is judged necessary, from the depressions [illegible] from the abandonment of that portion of [illegible] to remove them, the process is termed *picking at the eyes of the mine*. Where there are workings upon different lodes in the same mine, these are often connected with each other by means of cross-cuts, so that the ore may be brought to the shafts not only in the course of the lodes, but at right angles to their courses. Thus, in the Fowey Consols mine, one shaft cuts perpendicularly through five lodes, and by means of a cross-cut at the sixty-fathom level, it communicates with all the lodes, namely, thirteen, found at that level, in this mine.



By these processes, the workings of the mines have become so extended as gradually to lose their original simplicity. When the levels have been extended to a considerable distance from the shaft, the ventilation will again be found defective, notwithstanding the frequent communications by winzes; for the greater the distance the current of air is carried, the more feeble it plainly becomes. This deficiency is still further augmented by the increasing number of the men now employed in the works, the presence of a great number of candles, and the smoke resulting from the larger employment of gunpowder in the process of blasting. The expense, too, of the transport of ore and masses of rubbish to the shaft, is, on account of its greater distance, much more considerable. To add to these, we have the greater expenditure necessary for the drainage of the water from the mine, and for the support of its passages and roofs by timber. In order to obtain a clearer idea of these several matters, we shall consider them separately, and speak first of the shafts.

In addition to the circumstances just named, the irregular distribution of the metalliferous portions of the lode will cause inequality in the workings, and will, with the other matters, render the sinking of one or more shafts indispensable. Again, when the depth becomes very considerable, many of the first shafts are rendered in a great measure useless, either from their being inclined, and thus inconveniently circumstanced for machinery, or from having cut the lode at a shallow depth, and thus requiring cross-cuts progressively, longer in proportion to the increase of the depth and inclination or distance of the lode from the shaft. Hence, in very deep mines, a double line of shafts will often be found to range along the course of the principal veins; and sometimes even three shafts will be found placed opposite each other, and intersecting the same lode successively at increased depths. In such cases as this, while the most recent shafts are used for drainage and the extraction of the ore and masses of rock, the older and more shallow shafts are





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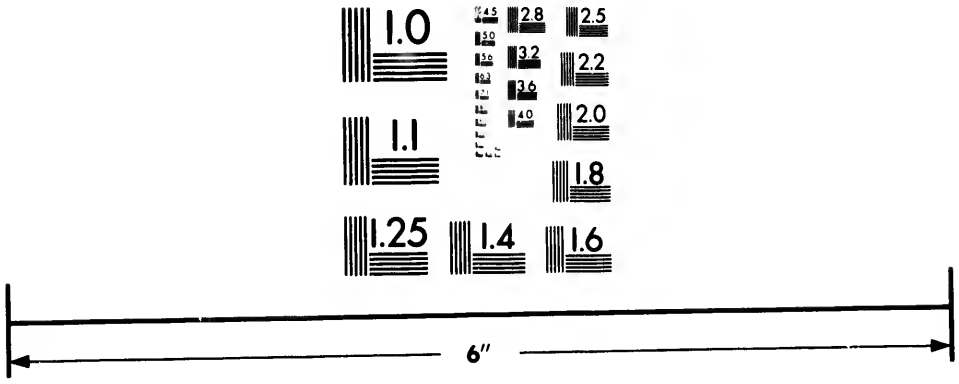

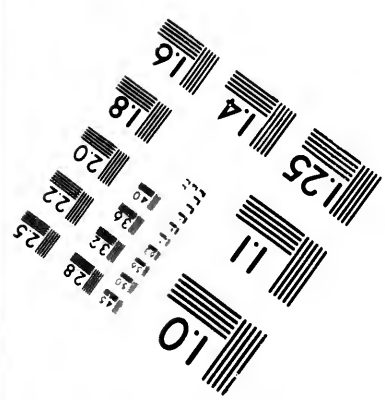

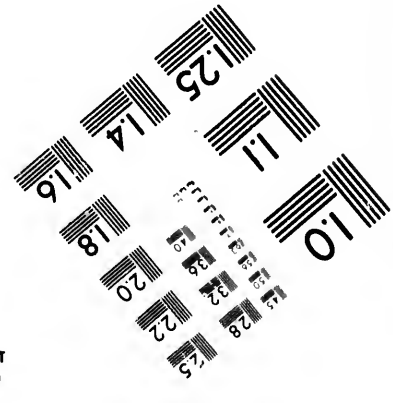

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often fitted up as foot-ways, and serve for the partial ascent and descent of the miners. In some of the large Cornish mines, it is customary to sink two new shafts within a few fathoms of each other, one being of large dimensions, and intended as a drainage or *engine-shaft*, and the other being smaller and adapted to the drawing only of ore and *stuff*. Both shafts are united at convenient distances by cross-cuts.

When circumstances permit, mines are entered by an adit in a hill-side, instead of by shafts. Of this character are the openings into the lead mines of the north of England, of Derbyshire, and of North Wales, all of which are situated in the carboniferous limestone, and the grits and shales resting upon it. In some valley, where the edges of the strata are exposed to view, a spot is selected from which it may be practicable to drive a level upon the vein itself, and in one of the beds known to be favourable to its productiveness. The progress of such a level explores the vein most efficiently, and opens a convenient passage for the extraction of the ore.

Drainage.

The influx of water from the rocky sides and bottom of mines, is a general and constant cause of annoyance, and the drainage is effected frequently at an enormous expense. So great is the cost of drainage in some instances, that, if the mines be of only a moderate value, they are altogether abandoned, and become choked with water. The process of drainage is usually effected by pumping, the apparatus being moved by either water or steam-power.

Pumps.—In the early periods of mining industry, wooden pumps alone were employed; but they have been for many years entirely superseded by iron pumps, which admit of the *lifts*, or columns, being carried to a great height without the danger of leaking or bursting. While the water-wheel, or steam-engine, is in course of erection, pumps are fixed in the shafts, of ten or twelve inches in diameter, for a moderate influx, and of proportionably larger size for a considerable body of water. None of the pumps used in mines act at all by atmospheric pressure, as in the case of the common household pumps; for they are invariably arranged in lifts of considerable height, such as from twenty to thirty fathoms, and the water itself is discharged into cisterns placed at the foot of each lift, whence it is raised again by mechanical means. The whole column of pumps in a shaft is usually worked by a single pump-rod, which traverses the middle of it, and communicates with each column by a rod attached to its side. To impart a reciprocating motion to the main pump-rod, a crank fixed on the axle of the water-wheel is attached to one end of a horizontal rod, the other end of which is connected with an apparatus termed a *bob*, consisting of an upright post movable on a centre, and firmly braced to a horizontal piece framed into it at bottom, the further end of which piece is connected with the pump-rod. Thus the rotatory motion of the water-wheel is converted into a uniform reciprocating motion, when communicated to the pump-rod.

Steam-Engines.—In our coal mines, where the fuel is of scarcely more than nominal value, the steam-engine is the only power ever employed for drainage, and in all deep and extensive works for extraction also. Hence, at the mouth of a coal-pit, almost any sort of a steam-engine or fire-engine has always been considered better than horse-power, because the former consumes the produce, and often the refuse, of the pit, and is very valuable for volatilizing the mass of small coals, which would otherwise lumber the mouth of the pit, and which, until very lately, were wantonly consumed in large burning heaps. The worst sort of engine would almost raise more coal in twelve minutes than it would consume in twelve hours.

Of course the steam-engines employed for drainage are erected close to the shaft in which the pumps are fixed, and which is called the *engine-shaft*. Over the centre of this opening one end of the beam hangs, and is connected with the pump-rod, which is elevated at each stroke of the engine, afterwards sinking by its own weight. This rod being counterbalanced by a *balance-bob*, as above described, the whole power of the engine is exerted in raising the column of water in the pumps. It has generally a cylinder of not less than forty inches in diameter, and of various diameters between that and eighty or ninety inches, according to the work to be done; ninety inches is, however, the largest cylinder ever constructed, and belongs to an engine estimated to be of 300 horse-power. The engine is enclosed in a large substantial *engine-house*, two or three stories high, so constructed as to afford convenient access to every part of the machine. The centre of the beam is supposed to be the front wall of the house, and a low building attached contains the boilers.

The present perfection to which the art of mining has attained, and the vast produce now afforded by our mines, are so intimately connected with the application of the steam-engine to mining purposes, that a brief notice of the improvements connected with the machine, and the economy of fuel arrived at, is indispensable. The chief peculiarities of the Cornish engines consist, 1st, in employing high-pressure steam (of forty or fifty pounds' pressure to the square inch of surface) *expansively*, by cutting off the communication with the boiler at one-fourth or one-fifth of the length of the stroke of the piston; 2d, in allowing a short interval between each stroke for the perfect condensation of the steam; 3d, in adopting every method whereby the radiation and loss of the heat from the boiler and the cylinder can be prevented. If the last particular can be accomplished, it is evident that in the same proportion a saving of fuel may be effected. The engine of Watt was first used as a substitute for that of Newcomen in draining mines, and its chief recommendation to mining companies was the alleged economy of fuel, of which Watt and his partner were so confident, and which they desired to make so prominent an advantage, that they only asked a profit in proportion to the saving which their engine effected, when compared with a common engine burning the same kind of coals; demanding that one-third of the saving should be paid them annually, or that the whole annual payments should be redeemed by paying ten years purchase-money at once, which in one instance we find, for three engines, exceeded £7,200 per annum.

The efficiency of a steam-engine for mining purposes is estimated by a standard which is termed *duty*, and which conveniently and accurately defines the work performed, with reference to the consumption of a given quantity of coal. By the duty of an engine is meant the number of pounds (always expressed in millions) of water which have been raised through the height of one foot by the consumption of a bushel of coal; the data for this calculation being the quantity of water discharged from the pumps in a given time, and the quantity of coal consumed by the engine in the same time. This was the mode of estimation first practised by Watt, who thus calculated the saving of fuel effected by his engine. In an old engine at Long Benton colliery, near Newcastle, out of sixty-three cubic feet of steam thirty-three were wasted, and the remainder, thirty feet, alone performed useful work; it was therefore clear that there was full scope for improvement.

In 1813, a system for the registration of the duty and other peculiarities of the performances of the engines working in Cornwall was organized, and the results, ascertained monthly, have since been published in the shape of monthly reports. In considering that some of the most powerful engines in Cornwall consume from three to four thousand bushels of coal per month, that

some mines employ several such engines, and that the mere expense of drainage is not unfrequently £12,000 or £13,000 per annum, the immense importance of the improvements, the results of which are just noticed, will be at once understood. The Messrs. Lean estimate the saving to the country effected since 1813, upon the whole number of engines reported, to amount to a hundred thousand tons of coal in the year, equivalent in value to £80,000 sterling per annum. The importance of the steam-engine to mines may be gathered from the instance of the Consolidated and United Copper Mines, where there are eight large steam-engines used in pumping, having cylinders of from 65 to 90 inches; one engine of 30-inch cylinder, and eight engines of about 20-inch cylinders, for drawing ore and other matter from the mines.

These great results have been arrived at by the adoption of the three methods above enumerated in brief, and by strict attention to the works connected with the pumps, in which a principal improvement is the use of one connected main-rod, with offsets to work each separate lift of pumps, instead of the old plan of a separate rod to each lift; to these must be added the adoption of the plunger-pole instead of bucket-pumps. These improvements have not been so much sudden discoveries as the effects of long and laborious investigation of the action of steam-engines, and a statement of the successive steps of improvement would in fact be a history of the improvements of the steam-engine.

Some idea of the quantity of water discharged by the engines in Cornwall may be gained by adducing an instance. In 1837, in the month of January, 62 engines discharged, per minute, 17,143 gallons; in June, 60 engines discharged 15,152 gallons per minute; in December, 56 engines discharged 12,891 gallons per minute. The greatest quantity of water is generally found in the mines after the winter months, which is produced by percolation from the top, or from surface water; the waters that rise from beneath being more constant in their supply.

The ventilation of metal mines is another most important matter of arrangement; but as it resembles that of coal mines, we include both under that head.

Support of Excavations.

A very considerable item in the expenses and difficulties of a mining establishment is that of the support of the excavations made in the works. The extent to which such support is necessary will naturally depend very much on the nature of the rock passed through, which may be either so hard and compact as to stand securely of itself, or so soft and friable as to crumble and crush together, unless the workings are effectually propped up.

As noticed above, masses of the rock, containing little or no productive ore, are generally left, which serve the purpose of pillars, and adequately keep up the roof; but where the whole is extracted, recourse must be had to *timbering* or *walling;* that is, to woodwork or brickwork, of which the former is in many respects the most suitable. In the sinking of the shaft, four pieces of timber of the requisite strength are framed into each other, and fixed within the shaft at intervals of about four feet apart, the intervening ground being supported by driving thin boards between each set of timbers and the rock. Passages and levels are usually supported by three pieces of timber, placed in the form of a doorway, rather narrower above than below, and framed together at the top in the strongest manner. These doorways are in figure something like those frequent in Egyptian sepulchral architecture. A succession of them, with intermediate supports and braces, will fully keep up the passages. The large open excavations, or *gunnies*, from which the ore has already been taken, are kept open by strong pieces of timber placed across them, and pressing against the two walls of the vein, which they thus prevent from closing together, as might be the case where the vein is much inclined, and consequently a great pressure existing in the unsupported inclined well.

The spaces formed by excavation are very useful for the reception of the *deads* and rubbish continually accumulating under ground, when the workings are carried on in the rock or in unproductive portions of the vein. It would be useless and expensive, except as far as is indispensable, to raise such rubbish to the surface, and therefore a *stull* is formed by placing strong timbers in the backs of the levels, upon which boards are laid, so as to make a close covering on which the *deads* and *attle*, or rubbish, are then thrown, till the space above has been entirely filled up. This mass becomes sufficiently solid to support the walls or sides of the vein in an effectual manner, and is a very cheap and convenient mode of fortification. Attention must be paid to the wood employed for timbering, as it is desirable that it should be of the strongest kind. Resinous wood, like the pine, lasts a much shorter time than the oak, the beach, and the cherry, although larch has been used with advantage. Oak has been known to last upwards of forty years; while the resinous woods commonly decay in ten years and upwards. It is also necessary that the wood should retain its whole useful force of resistance, and therefore only those pieces are squared which absolutely require it. The spars of the frames in the shafts and galleries are deprived merely of their bark, which, by retaining moisture, would accelerate the decomposition of the wood.

In many mines it is found more advantageous to support the excavations by brick or stone walling and building, constructed either with or without mortar. Such erections are indeed more costly than wooden ones, but they last very much longer, and need far fewer repairs. Sometimes the two sides of a gallery are lined with upright walls, and its roof supported by a vault or arch.

Dressing Ores.

On bringing ores to the surface, the first thing done is to separate the valuable material from the refuse, and then subject it to the smelting process.

With respect to copper ores, the dressing commences by riddling the pieces, after which they are broken or crushed by mechanism contrived for the purpose. A further separation of the more valuable portions of the pulverized ore from that which is less so, is effected by an operation termed *jigging*, which consists in keeping the whole of the mineral particles suspended in water for a time sufficient to allow of the subsidence of the more ponderous portion. This is accomplished by the agitation of the water in a sieve, in which the broken ore is placed, the more pulverized part passing through the interstices of the sieve, and the heavier and larger pieces occupying the bottom of it, after which separation the light and worthless stone may be removed from the top with a piece of wood. The agitation of the water was formerly entirely, and is at present extensively, effected by hand labour, in which boys were commonly employed. Machinery has, however, in a large proportion of the more considerable works, been applied to this process in two different arrangements, by one of which a succession of sieves are kept in motion under water by means of a connection with a water-wheel or steam-engine; by the other, the water itself, in which a number of sieves are immersed, is kept in agitation by the motion of a body in the centre.

An idea of the labour attendant upon the dressing of copper ores, and of the necessity for it, may be formed from the fact, that the average quantity of copper contained in the ore is rather less than 9 parts in 100. In these processes, and indeed in all the operations for

dressing, many of the minutest particles are carried away whenever a stream of water is employed by the flow of the liquid. A waste of this kind in an extensive mine would be considerable, and it is therefore arranged that all such water shall pass into successive reservoirs termed *slime-pits*, in which the metallic particles fall to the bottom, and are from time to time collected and subjected to such treatment as to obtain them in a tolerably fine state. The great principle upon which all the varied apparatus and processes which are employed in different mines in all parts of the world depends, is the difference in specific gravity between earthy and metallic matter, the one being generally double that of the other. The dressing-floors of a mine are always arranged as near the mouths of the principal shafts as possible, the ore being conveyed to them by a small railway. The floor itself is paved, and there are one or two side-ranges of sheds for the workers, and buildings containing the apparatus employed, an adequate supply of water being provided by an artificial channel or *leat*. Of course, from very rich veins ore can be obtained which scarcely requires any other dressing than one reduction by hammer, and it is in proportion to the poorness of the vein that the operations of this nature extend.

The dressing of lead ores is exhibited on the largest scale in the lead mines of Northumberland and the neighbouring counties. The processes differ in many respects from those just described. *Grating* is the first operation performed with the contents of the vein. A large grate receives the ore, on to which a feeder of water runs, an adult being present to direct the operations of the young boys by whom this business is accomplished. The smallest of the pieces run through the grate into a *trunking* box, which is placed underneath for their reception, and out of which they are subsequently thrown on one side to be *hotched*. Hotching is the agitation, by a boy, of the ore in a large square brake-sieve, to which a long lever or arm is attached. The brake-sieve being balanced or fixed at one point, the boy, by means of this handle, shakes the contents so as to separate the ore. The small pieces of ore thus hotched into a tub below, are wheeled from this to a *running buddle*, which is a small space of excavated ground paved with a stone floor. Water being caused to flow gently over this, the ore is placed in it, and stirred by a *colrake*, until a considerable purification takes place, and the pure ore is ready for delivery to the smelter. This final process is termed *buddling smiddum*, and does not prevent the passing away in the water of fine particles of lead. The water is therefore directed into *sludge* and *slime-pits*, and several further operations are performed to obtain these particles; but this proceeding is only adopted in large concerns. About forty years ago, crushing-mills were introduced, by which, in nearly all cases at present, the pieces of ore are in the first instance reduced, and then submitted to the processes above briefly noticed.

Tin ores require somewhat modified processes from those performed upon copper and lead ores. Being very minutely and intimately disseminated in the vein-stone, or rock, a more complete pulverization is requisite for its separation from it. The pieces are therefore generally reduced, in the first instance, in a *stamping-mill*, by means of heavy weights or hammers, lifted by machinery, and allowed to fall upon the ore; while a stream of water constantly passes through the mass, and washes away the portion which is bruised sufficiently small to pass through an iron plate pierced with holes, and forming one side of the box in which the stampers work. The ore thus obtained is submitted to the *jigging* and other operations, which are usually more numerous and more carefully attended to in the case of tin ores than in copper and lead, and they may be so prolonged as to yield a produce of 50 or 60 per cent. of tin.

In Germany and France they are somewhat in advance of the Cornish miners in the machinery employed in dressing ores, their *shock-frame* being superior to any thing of the kind used in Cornwall.

Thus are the three principal metals dressed at the surface of the mines. We have somewhat minutely detailed the processes, inasmuch as, from their being conducted around the top of the shafts, they commonly attract more of the attention of strangers and visiters than the other operations of mining.

The ores of the precious metals require a peculiar treatment, from their existence in a state of minute subdivision, mixed with a large quantity of earthy matter Gold ores are generally stamped, and silver ores are ground to an exceedingly fine powder; but, from the great value of the metals, the process of washing is differently conducted, and in some instances is altogether dispensed with.

Superintendence—Management.

The business of a mine is divided into several departments, namely, the under-ground operations, the pit-work, and machinery, the dressing and surface work, accounts and financial subjects, and the general control. Proper agents or superintendants are allotted to each department, and are all rendered subordinate to one general manager, who at stated periods communicates with the whole united body of shareholders or *adventurers*, or with a select committee chosen from them. This general manager, named the *purser*, is, in large concerns, a man of superior education and ability in reference to the duties of his office. The agents and subordinate officers are usually chosen from the most intelligent working miners, who, indeed, are peculiarly qualified for their tasks, by their thorough practical knowledge of the nature of the labour, and of the frauds which dishonesty might attempt. It is evident that such promotions act as a powerful stimulus upon the miners at large, and they are found to be in general an intelligent set of men. The agents are locally denominated *captains*, and there are the underground captains, and the *grass* or surface captains: their titles, however, like those of higher import, do not entitle them to take precedence away from their native districts.

The shareholders themselves usually form companies of 64, 100, 128, or several thousands in number, who hold grants or leases of the property from the mineral proprietors for a certain term of years—commonly twenty-one—renewable under certain conditions. The risk and responsibility of the undertaking entirely devolve upon this company, whom both the capital is provided and the management conducted, while the proprietors of the minerals receive a stipulated portion of the gross returns of the mine as a consideration for the use and deterioration of his property. This proportion of course varies accordingly with the risk and outlay of capital. Where the mines are easily and cheaply worked, as in the north of England lead mines, it amounts to an eighth or a tenth; but in Cornwall, where the mines are deep and most expensive, it seldom exceeds a fifteenth, an eighteenth, or a twenty-fourth, and is even as low in some instances as a thirty-second. This payment is termed the *royalty*, from the circumstance of all minerals having originally been the property of the king; and is subject to no fixed value, for it is often sound policy to reduce it, so as to enable companies to avoid the hazard of bankruptcy. It is well known that mining property is exceedingly liable to fluctuations in value, especially in metalliferous mines. The capital required to open mines in this country varies from £4000 to £150,000, and the profit upon this, in some instances, scarcely repays the capital expended; while in others, after paying back this sum, it amounts to two or three hundred thousand pounds. The duration of mines, too, in a working condition, is a matter of great uncertainty, some few being now in ope-

vation which are known to have been opened centuries since, but many are of modern origin, and cannot be expected to be wrought for more than a few years.

The Miners.

The total number of persons employed in and about the Cornish and Devon mines is estimated at 30,000. The captains are, upon the whole, a respectable and intelligent body of men. The miners themselves are of frank and independent manners, and though not often insolent, they are usually blunt, the younger ones affording, perhaps, the least favourable examples of behaviour. The adult miner earns at present from 40s. to 65s. per month by his own labour; and if he has both sons and daughters employed about the mine, may take from the mine, on their account and his own, £8 or £10 in the same period. The men now occupy decent cottages, frequently their own property, and in the last case they farm or garden a little. Generally speaking, the miners are a somewhat religious people, and frequently Methodists. There are, however, unfortunately, exceptions to this remark, and particularly amongst the younger persons. Taking Cornwall as a whole, crime is increasing more rapidly than population. The physical effects of the employment upon the workmen in the lead mines are very pernicious. Whether it result from any emanation of noxious gases from the lead and strata, or from the otherwise impure atmosphere of the mines, may be questionable; but Mr. Leifchild found, by an examination of the parish registers in the Northumbrian districts, that the average term of life was only 48 years and 5 months for the males, and 53 years and 1 month for the females; while for the people of the same districts otherwise engaged, it is 61 years. The disease to which the lead miners are subject is chronic asthma, generally terminating in pulmonary consumption. These men are, however, extremely attached to their dales, and there is no fear that any of them will be deterred from pursuing their calling by any supposition of its unhealthiness. No females are ever employed under ground in the Cornish mines, or in any of the metalliferous mines of England, that stigma having been confined to coal mines.

METALLURGY—METALS.

The processes of smelting and finishing metals, to render them suitable as marketable commodities, are usually treated of under the term Metallurgy; and to these we shall now advert.

Iron.—The various kinds of ironstones or ores are first roasted in large heaps in the open air, for the purpose of expelling the sulphur and arsenic with which they are commonly combined, and also to facilitate their reduction. The roasting is assisted by the combustion of coal or charcoal, and it is calculated that the stone loses from thirty to forty per cent. during the operation. The ore is then transferred to the blast furnace, which is usually a large pyramidal building, with arched openings at each side for the insertion of the blast pipes. Of late years blast furnaces have been built of a round shape, called the cupola furnace, which form is by many preferred. The inside is either cylindrical or square, widening from the top to near the bottom, when it is suddenly contracted, and terminates in the hearth or crucible in which the metal is received. The blowing pipes are situated a little above the hearth on each side, and the air is forced into the furnace by means of an engine adjoining the furnace. Into this furnace the ore, or *mine*, as it is called, is put, along with coke as the combustible agent, and lime to act as a flux. By the combustion of the coke an intense heat is raised, which softens the ore; the limestone combines with the earthy ingredients of the ore, and the metallic particles fall down into the hearth or crucible. When it is properly fused, a tap-hole is opened in the crucible, and the metal flows out into a fosse bedowed with water mixed with clay, which forms a coating to prevent the metal from sticking to the ground.

To obtain a ton of pig-iron by the above process, it is stated that 55 cwts. of roasted ore, 25 cwts. of limestone, and 40¾ cwts. of coal are required. The coal is put into the furnace first, the limestone on the top of the coal, and the iron ore last. At the end of about twelve hours, the metal is allowed to run from the hearth; the furnace is again charged, and the process may be carried on for an indefinite period without intermission. To make good iron, the ingredients must be justly proportioned, and the blast kept regular during the whole operation. Even the season of the year and the direction of the wind are said to affect the quantity and quality of the iron.*

Hot air is now universally used in the blasting furnaces, an improvement which has greatly lessened the expense of iron manufacture. The heating apparatus consists of two large cast-iron cylinders, the one being placed within the other, leaving a space between. The outermost cylinder is closed at both ends, but the innermost is left open, with nine rows of pipes, three in each row, which cross its interior, and communicate with the space between the cylinders. This apparatus is placed within the mouth of the furnace, the flames from which pass through between the pipes. The air from the blowing machine enters the space between the cylinders, and circulates by means of the cross pipes. By this invention the consumption of fuel at the Calder iron-works has been diminished in the proportion of 7 tons 17 cwts. to 2 tons 2 cwts.

Cast-iron, as it comes from the blasting-furnace, is full of impurities, such as fragments of charcoal, earthy matter, &c., which require to be removed by a refining process. There are three varieties of cast-iron, easily distinguished from each other. No. 1 cast-iron is of a dark colour, open in the grain, and is rendered fusible by comparatively little heat. No. 3 is very white in colour, excessively brittle, and does not melt freely. No. 2 is an intermediate variety between the other two, and possesses a combination of the properties of each.

The refining furnace is a small low building of brickwork, rising little above the surface of the ground. The hearth or crucible is composed of fire-brick, and is generally about three feet square. Coke is first placed upon the hearth, and the iron upon the coke, which is again covered in the form of a dome with coke. The fire is then lighted, and the hot-air blast applied about a quarter of an hour afterwards. While burning, a bluish flame is seen playing on the surface of the metal, which is formed by the combustion of carbon. When properly melted, the metal is run out into oblong moulds, and water cast upon it to render it brittle, and also partly to oxidize it. The metal thus suddenly cooled is very white, and possesses in general a fine radiated fibrous texture.

Cast and Malleable Iron.—Iron is made to assume two distinct forms, differing considerably in their nature, cast and malleable. Cast-iron articles are made by running iron in a state of fusion into moulds of fine sand or loam, according to the required shape. The mould is formed by means of a wooden pattern, which being sunk in the sand, and then withdrawn, leaves a cavity of the desired shape, into which the red-hot liquid iron is run from the furnace. Malleable iron is made from the metal in a state of fusion by means of what is called a *puddling furnace*, where it is raised to a very high temperature. After being stirred frequently to facilitate the combination of the carbon and oxygen, it gradually assumes the consistency of a stiff paste. It is then taken out and subjected to the action of a very large hammer, or the pressure of rollers, by which it becomes soft, ductile, and malleable. In this state it is called wrought, forged, or

* Encyclopædia Britannica

bar-iron, and is ready for the various operations of the blacksmith and machine maker.

Steel.—On malleable iron of a good quality being combined with carbon, it forms steel. The best steel is that made from Swedish and Russian iron. "The general method of forming steel is by the process of *cementation*. A furnace is constructed of a conical form, in which are two large cases or troughs of fire-brick, capable of holding some tons of iron. Beneath these is a long grate, on which the fuel is placed. On the bottom of the case is placed a layer of charcoal dust; over this a layer of charcoal powder, and the series of alternate layers of charcoal and iron is thus raised to a considerable height. The whole is covered with clay to exclude the air; and flues are carried through the pile from the furnace, so as to communicate the heat more completely and equally. The fire is kept up for eight or ten days. The progress of cementation is discovered by withdrawing a bar, called the *test bar*, from an aperture in the side. When the conversion of iron into steel appears to be complete, the fire is extinguished, the whole is left to cool for six or eight days longer, and is then removed. [The absorption of the carbon by the metal is when the interior of the troughs has attained 70° of Wedgewood's pyrometer.] The iron prepared in this manner is named *blistered steel*, from the blisters which appear on its surface. To render it more perfect, it is subjected to the action of the hammer, in nearly the same manner which is practised with forged iron; it is beat very thin, and is thus rendered more firm in its texture, and more convenient in its form. In this state it is often called *tilted steel*. When the bars are exposed to heat in a furnace sufficient to soften them, and afterwards doubled, drawn out, and welded, the product is called *shear steel*. Cast steel is made by fusing bars of common blistered steel with a flux of carbonaceous and vitreous substances, in a large crucible, placed in a wind furnace. When the fusion is complete, it is cast into small bars or ingots. Cast steel is harder and more elastic, has a closer texture, and receives a higher polish, than common steel. It is capable of still further improvement by being subjected to the action of the hammer.

"The most remarkable, as well as the most useful of the properties of steel, is the power which it has of changing permanently its degree of hardness, by undergoing certain changes of temperature. No other metal, says Thenard, is known to possess this property, and iron itself acquires it only when it is combined with a minute portion of carbon. If steel is heated to redness, and suddenly plunged in cold water, it is found to become extremely hard, but at the same time it is too brittle for use. On the other hand, if it be suffered to cool very gradually, it becomes more soft and ductile, but is deficient in strength. The process of tempering is intended to give to steel instruments a quality intermediate between brittleness and ductility, which shall insure them the proper degree of strength under the uses to which they are exposed. For this purpose, after the steel has been sufficiently hardened, it is partially softened, or let down to the proper temper, by heating it again in a less degree, or to a particular temperature, suited to the degree of hardness required, after which it is again plunged in cold water.

"Different methods have been pursued for determining the temperature proper for giving the requisite temper to different instruments. One method is to observe the shades of colour which appear on the surface of the steel, and succeed each other as the temperature increases. Thus, at 430 degrees of Fahrenheit, the colour is pale, and but slightly inclining to yellow. This is the temperature at which lancets are tempered. At 450 degrees a pale straw colour appears, which is found suitable for the best razors and surgical instruments. At 470 degrees, a full yellow is produced, suitable for penknives, common razors, &c. At 490 degrees, a brown colour appears, which is used to temper shears, scissors, garden hoes, and chisels intended for cutting cold iron. At 510 degrees, the brown becomes dappled with purple spots, which show the proper heat for tempering axes, common chisels plane irons, &c. At 530 degrees, a purple colour is established, and at this degree the temper is given to table-knives and large shears. At 550 degrees, a bright blue appears, used for swords and watch-springs. At 560 degrees, the colour is a full blue, and is used for fine saws, augers, &c. At 600 degrees a dark blue, approaching to black, has become settled, and is attended with the softest of all the grades of temper, used only for the larger kinds of saws.

"Another method of giving the requisite temper has been practised upon various articles. The pieces of steel are covered with oil or tallow, or put into a vessel containing either of these ingredients, and heated over a moderate fire. The appearance of the smoke from the oil or tallow indicates the degree of heat. If the smoke just appear, the temper corresponds with that indicated by the straw colour when the metal is heated alone. If so much heat is applied that a black smoke arises, this points out a different degree of hardness; and so on, till the vapour catches flame. By this method, a number of pieces may be done at once, with comparatively little trouble, and the heat is also more equally applied.

"A still more accurate method of producing any desired degree of temper, is to immerse the steel in some fluid medium, the temperature of which is kept regulated by the thermometer. Thus oil, which boils at about 600 degrees, may be used for this purpose at any degree of heat which is below that number of degrees. Mr. Parkes has recommended the employment of metallic baths, chiefly composed of lead and tin, in different proportions, which pass into fusion at definite temperatures, and which can be used for tempering steel as soon as they arrive at their melting points."*

Iron Articles.—The articles formed of iron and steel are so numerous as to be beyond calculation. The apparatus of steam-engines, machinery of all kinds, fire-arms, and agricultural implements, are among the variety of larger articles produced. In England, where iron manufactures are on the most perfect scale, it is customary to make each class of articles at a distinct factory or engineering establishment, by which division of labour the work is in all cases of the best order and of the newest inventions. Some of the largest manufactories of engines and machinery are established in Manchester, Leeds, London, and Glasgow; while articles of a smaller kind, including cutlery, are made principally at Birmingham and Sheffield.

The English cutlery manufacture is very extensive, and is excelled by that of no other country, though now nearly approached by that of Belgium. "The inferior kinds of cutlery are made of blistered steel welded to iron. Tools of a better quality are manufactured from shear steel, while the sharpest and most delicate instruments are formed of cast steel.

"The first part of the process consists in forging, and is varied according to the kind of article to be formed. Common table-knives have the blade forged of steel, and welded to a piece of iron, out of which the shoulder, and part which enters the handle, are made, the shape being given to them by hammering in a die and swage. They are afterwards tempered and ground. Forks are made by forging the shank, and flattening the other end to the length intended for the prongs. The prongs are made by stamping the metal at a white heat between two dies, the uppermost of which is attached to a heavy weight, and falls from a height. The shape is thus given to the fork, leaving, however, a flat thin piece of metal between the prongs, which is afterwards cut out with a

* Bigelow's Technology.

by press. They are subsequently filed, bent, hardened, and polished.

"Blades of penknives are forged from the end of a rod of steel, and cut off, together with metal enough to form the joint. The small recess in which the nail is inserted to open the knife, is made with a curved chisel, while the steel is hot. Razors are forged from cast-steel, much in the same manner as knives. The anvil is commonly a little rounded at the sides, for the purpose of making the sides of the razor a little concave, and the edge thinner. In forging scissors, the shape is given to the different parts by hammering them upon different indented surfaces, called *bosses*. The bows which receive the finger and thumb, are made by punching a hole in the metal, and enlarging it by hammering it round a tool, called a *beak* iron. The halves are finished by filing and grinding, and afterwards united by a joint. Saws are made from steel plates rolled for the purpose, and have their teeth cut and finished by filing, and set by a suitable instrument. Axes, adzes, and other large tools, are forged from iron, and have a steel piece welded on, of the proper size, to form the edge.

"To enable the steel to be wrought, it is brought to its softest state, but after the shape is given to the instrument, the steel is hardened and tempered by the methods already described. The remaining part of the manufacture consists in grinding, polishing, and setting the instrument, to produce a smooth surface and a sharp edge. The grinding is performed upon stones of various kinds, among which freestone is perhaps the most common. These stones are made to revolve by machinery, and move with prodigious velocity, so that the surface, in some cases, passes over six or seven hundred feet in a second, and stones have been burst by their own centrifugal force. For grinding flat surfaces, like those of saws, the largest stones are used; while for concave surfaces, like the sides of razors, smaller stones are used, on account of their greater convexity. The internal surfaces of scissors, forks, &c., which cannot be applied to the stone, are ground with sand and emery, applied with instruments of wood, leather, and other elastic substances. The last polish is given by a material composed chiefly of the oxide of iron. The edges are lastly *set* with hones and whet-stones, according to the degree of keenness required. The test used by cutlers for determining the goodness of the edge and point of a lancet is, that it shall pass through a piece of soft leather without sensible resistance. Needles are polished by tying them in large bundles with emery and oil, and rolling them under a heavy plank till they become smooth by mutual attrition. The shape is previously given, and the eye made with a steel punch."*

Lead.—When lead ore comes from the mine, the first operation is to wash and sort it into heaps of different qualities; this is done either by putting the ore into a trough and stirring it, or filling a sieve, the meshes of which are made of iron, and immersing it in a vat full of water. Another process is to put the ore upon an instrument called a *grid*, which consists of a number of bars of iron placed parallel to each other, about an inch apart. Over this grating a stream of water flows, which washes away all impurities, and also separates the small pieces of ore from the large. The smaller pieces are then collected into a finer sieve, and washed again, and all pure ore which may be still amongst them is carefully picked out with an iron scraper. This washing is greatly facilitated by the specific gravity of the metal. The ore containing most galena sinks first, and is found next the bottom of the vat; a second quality of ore will be found on the top of this, and the inferior kinds above it. When the sieve is immersed in the water, it is shaken pretty severely, which causes the ore in a manner to float, and allows the heavier pieces to sink to the bottom. The different qualities of ore thus obtained are separated from each other by the iron scraper called a *crimp*.

The mixed ore, that is, such as contains stone and other impurities in the lump, along with pure galena, is then sent to the grinding-mill. This consists either of solid uprights shod with iron, and moved up and down by a horizontal spindle furnished with arms, or a pair of fluted cylinders, through which the ore is made to pass, and it is afterwards ground to the requisite fineness by smooth rollers. The mixed ore, after being ground, is again washed, and the pure galena separated from the impurities.

There are two kinds of furnaces used in the smelting of lead ore—a reverberatory furnace, called a *cupola*, and the other known by the name of the *Scotch furnace*. The first, in the interior, is generally eight feet long, six feet wide, and two feet high at the centre. The fire is placed at one extremity, and is separated from the smelting part by a wall, which is built about half the height of the furnace. The hearth upon which the ore is placed is composed of furnace slags, and it slopes from the wall which separates it from the fire to the other end of the furnace, and is hollowed from the sides to the centre. This is enclosed by an arched roof, in the middle of which is a small aperture for admitting the ore from a hopper placed above it.

About 20 cwts. of ore are usually put into a furnace at a time, which is spread equally over the hearth with a rake. For the first two hours, no regular fire is made, a gentle heat merely being kept up by putting small coal on the furnace, the doors of which are kept shut. This is called the roasting process, which is formed principally for the purpose of dispelling all sulphureous vapours from the ore. At the end of two hours the fire is raised, and the metallic lead soon begins to flow from the ore. The smelter and his assistant now stir the ore at intervals, and a shovelful of quick lime is thrown in. This is done in order to liberate the oxide of lead from the ore, and allow it to react upon any sulphuret which may have resisted the roasting. The heat is again increased, and the stirring continued. In about four hours from the commencement, the furnace receives its greatest heat, after which a tap-hole is opened, and the lead runs into an outer basin. From this it is cast in semi-cylindrical moulds, and receives the name of bars.

The Scotch furnace is much of the same nature as the above, except that the hearth, sides, and sole-plate, are made of cast iron, from two to three inches thick. The roasting is performed with peat and coke, and the furnace is urged by wooden bellows. In advance of the furnace a basin is placed, for the reception of the lead as it flows from the furnace.

The quantity of lead obtained from the mines of Great Britain, annually, has been estimated at nearly 40,000 tons.

The articles made from lead are *sheet-lead*, which is cast on large tables, and smoothed and thinned by rollers; *lead-pipes*, which are generally made by drawing through a mandril; and *leaden shot*, which is formed by dropping melted metal in a shower from a great height. Towers for making shot are conspicuous objects in London.

Copper.—The ores are roasted by a low heat, in a furnace with which flues are connected for collecting the sulphur which is volatilized. The carbonates of copper reduced by fusion, afford a pure copper; and this is an easily wrought metal, useful for many purposes. Copper alloyed with zinc forms brass, which is extensively used for articles of ornament by brass-founders.

Tin.—The ore of tin, when melted in furnaces and run like iron, is shaped into blocks or pigs. The uses of tin are very numerous, and so well known that they scarcely need to be pointed out. A very important ap-

* Bigelow's Technology.

plication of tin is in the coating of other metals, such as those of iron and copper, which have been formed into vessels. The silvering of looking-glasses, and the fabrication of a great variety of vessels and utensils for domestic and other uses, are among the advantages derived from this metal.

COAL MINES.

As explained in our article GEOLOGY, coal belongs to the secondary order of rocks, in which it is defined as the *carboniferous group*. With respect to its origin and character, it is entirely a mass of vegetable matter, which has accumulated in certain situations, and afterwards been covered over and pressed into a hard consistence under other strata—generally mud or sand—which in time has become layers of limestone or sandstone. Coal is not found in veins or deposits resembling metalliferous substances; it is discovered in large basin-shaped patches in different parts of the world, and always in the same position with relation to adjoining strata. Geology being almost unknown as a practical science some years since, frequent trials were made to obtain this fuel, where we now know nature never intended that it should be found; although blackish, charred, woody and peaty substances led to the expectation of its presence, and caused the useless expenditure of large sums of money. The coal-seams, together with their alternating strata, are usually called the *coal-measures*, and the basin-shaped deposits in which these lie are termed the *coal-fields*. In either form, coal is found in vast abundance in various parts of England, Scotland, and Ireland, and constitutes the most valuable of all our mineral products, for without it most others would be nearly useless. The entire British coal-fields may be classified as follows:—

The coal of Scotland.—The coal-fields of Scotland are of great extent and value, indeed sufficient of themselves to furnish the whole empire with an adequate supply of this mineral for a long series of years. Coal is found in several districts of Scotland, as in Dumfriesshire and Roxburghshire, in the more southern counties; but the great field of Scotch coal stretches from south-west to north-east across the centre of the kingdom; and it is to be found in greater or smaller quantities in the counties of Haddington, Edinburgh, and Linlithgow, Stirling, Clackmannan, Kinross, Fife, part of Perth, Ayr, Renfrew, Lanark, Dumbarton, and part of Argyle. Its average breadth is thirty-three miles, and its length upon the mainland of Scotland ninety-eight miles; so that its total area is 3234 square miles. If from this we deduct 360 miles for the space covered by the Frith of Forth, there will remain 2874 square miles of territory, in most parts of which coal is found at different depths and of various qualities, whilst in about 600,000 acres of the same space it may be worked with advantage. The depth of coal varies, but in general it seems to be rather nearer the surface in the western than in the eastern division of the country. There is also a great variety in the number of its seams or strata, as well as in their thickness. The greatest thickness in the island is at Quarrelton, where five contiguous strata are upwards of fifty feet thick. Seams less than eighteen inches are not deemed equivalent to the expense of working them.*

The coal of Ireland is found in seventeen counties of that country. The chief district is that of Munster, which occupies a considerable portion of Limerick, and Kerry, and also a part of Cork; next are the Connaught and Leinster districts. Some of the coal-fields are of the carbonaceous, while others are of the bituminous quality. Comparatively little is raised, and almost all the coal used in Dublin, Belfast, and other towns, is imported from England.

* General Report of Scotland.

The coal of England and Wales may be thus classified:—1. The great northern district, including all the coal-fields north of the Trent. 2. The central district, including Leicester, Warwick, Stafford, and Shropshire. 3. The western district, which may be subdivided into north-western, including north Wales; and south-western, including south Wales, Gloucester, and Somersetshire.

Coal is found in these fields in strata of various thicknesses, alternating with clay, slate, and sandstone, the alternations being frequently and indefinitely repeated. These beds or measures commonly repose upon millstone grit, and shale, which sometimes exceed 120 fathoms in thickness. Under this series is the carboniferous or mountain limestone, varying in thickness up to 900 feet; and this is again succeeded in the descending order by the old red sandstone, ranging from 200 to 2000 feet in thickness. These four different series are generally comprehended in the term *coal-formation*, although the three last do not form an essential and invariable part of it, being sometimes absent. A general resemblance in their structure is observable in all the English coal-fields, but they greatly differ in minor particulars.

By far the most important and best known of all the English coal-fields is undoubtedly that of Northumberland and Durham, the pits of which ship their produce by the rivers Tyne, Wear, and Tees. The coal raised from these mines is of the most valuable character for domestic purposes, and as such has obtained a notoriety throughout the civilized world. There are three principal kinds of coal found in Great Britain:—1. The *caking* coal (distinguished by various provincial designations), yielding about 40 per cent. of bitumen, the quantity of which is the chief recommendation to a household coal. This is the prevailing kind in the Northumberland and Durham mines. 2. The *cannel* coal, called in Scotland *parrot* coal, which occurs in Lancashire, and contains about 20 per cent. of bitumen. 3. The *stone* coal, known also under many other names, which is the ordinary coal of the Staffordshire and Scotch collieries, and is largely consumed in manufacturing processes.

This great northern coal-district commences near the mouth of the river Coquet on the north, and extends nearly to the Tees on the south. As far as Shields, the sea is the boundary on the east; but from that point it leaves a margin of a few miles between it and the sea, and extends about ten miles west from Newcastle. Its greatest length is 58 miles, and its greatest breadth about 24. It supplies a very large portion of England, including the metropolis, part of Scotland, and many foreign countries. The coal-measures of this field rest upon the millstone grit and shale, and lie, in the south Durham portion, under the magnesian limestone, the northernmost point of which projects near the mouth of the Tyne. In consequence of the basin or boat-shaped disposition of the coal, the beds at some places appear at or crop out to the surface, while, in the central parts of the concave or basin, they lie at great depths. The beds of this series of coal-measures are 82 in number, and consist of alternations of coal, sandstone, and slate clay, forming an aggregate thickness of 1620 feet. The number of really workable and productive seams of coal in this field are 17; but of these only about four or five yield the best coal. These are variously named as the High Main and the Low Main, the Bensham and the Hutton seams, the last extending over the whole of the eastern part of Durham, and ranging in thickness from 4 to 5½ feet, of which, however, 2 feet frequently turn out to be coarse coal, unfit for the market, and suitable only for mending the horse roads. It seems probable that more accurate and complete knowledge will establish the identity of some of those seams which are now distinguished by different names.

The extent of the whole surface of this coal-field is a subject of dispute; but, according to the most received approximation, Northumberland contains 243 square miles, and Durham 594 square miles, making 837 square miles for the two counties. Of this the portion already excavated is computed to be about 105 square miles; and from a minute calculation, it has been deduced that, according to the present issue of coal from the chief parts in this field, there remains enough to warm and cheer our posterity for 1700 years to come. It should be mentioned, however, that Professor Buckland, in 1830, limited the supply, at the existing rate of consumption and waste, to 400 years. This last calculation, however, assumed as one of its elements the continuance of the practice of screening coal at the pit's mouth, by which from one-third to one-fourth of the quantity of coal drawn was separated into small coal heaps, and ultimately consumed in the most wanton manner. The present regulation, however, of selling coal by weight instead of measure, has done away with this abuse to a great extent. Great misconceptions prevail upon the available quantity of coal in each seam. The actual quantity of coal in the Newcastle coal-field does not amount to more than a twenty-fifth part, or 4 per cent., of the whole mass of strata accompanying it, of which mass various kinds of sandstone form about 36 per cent., and strata in which siliceous earth predominates about 44 per cent. Again, when the seam of coal itself is gained, all is not marketable coal that looks black, in the same way as "all is not gold that glitters." There is much impurity even in the most valuable seams, in the shape of what is termed by the pitmen *band*, *swad*, and *foul coal*. In a seam producing one of the most approved coals for the London market, we found the *good coal* to be only 2 feet 3 inches in thickness, while the whole seam of coal was 5 feet 6 inches thick.

Coal Shafts and Workings.

Coal mines are reached by circular shafts, as in metal mines; and the sinking of these forms a large item of expense, for the operation involves the erection and working of a steam engine to draw off the water, and the blasting of any rocky matter that intervenes. The working beneath, to form the necessary excavations, is also liable to great impediments from the occurrence of *dykes*. These are generally of the character of dislocations in the strata, a seam of coal being all at once stopped by a barrier of stone, and continued at a different level. But although the dykes thus impede operations, they are useful in forming walls to prevent the intrusion of water. The cutting of a dyke or fault of any extent is carefully avoided by coal-miners, as the penetration of this barrier, which nature seems to have interposed by way of a warning to the ardour of the excavator, would often admit a rush of waters from the other side, and cause the inundation of the mine; for these interruptions assume the office of coffer-dams in stopping the passage of the water in many cases. At Gosforth colliery, about two miles north of Newcastle, the manager described to us, while standing nearly over the 90-fathom dyke, that, about the year 1825, a shaft was attempted to be sunk on what turned out to be the wet side of this great dyke, but it was speedily abandoned, in consequence of the perpetual influx of water. The adventurers then merely crossed the dyke by advancing a few yards; and having thus reached the dry side, they sank the present shaft, in which they were compelled by this short journey to descend nearly 200 fathoms before they could reach the coal; this, however, they succeeded in doing without any obstruction from large quantities of water.

Shafts vary in depth, according to the situation of the stratum or seam to be reached. The deepest are those in the Newcastle district. The writer of the present article descended and inspected twelve of the principal pits in this field, selecting such as were deepest and largest, or otherwise peculiar and important. Three of the shafts of these were each five hundred and odd feet deep, three were each eight hundred and odd feet, and three others, each one thousand and odd feet deep. The deepest shaft in this coal-field, and probably in any other, is one thousand six hundred feet deep, and we were about four minutes in descending. This is the celebrated Monkwearmouth shaft, the difficulties encountered in sinking which were perhaps as formidable as any upon record. This is generally believed to be the deepest perpendicular shaft in the world, if the level of the sea is regarded. We find it, however, stated of one near Namur, in the Netherlands, that it is two thousand four hundred feet in depth, although no particulars are given whereby to judge of its relative depth below the level of the sea, or of its perpendicularity. The readiest method of forming an idea of the depth of such a shaft as the Monkwearmouth, is to consider that it would contain the Monument of London piled eight times upon itself!

In Lancashire, the deepest shafts are about eight hundred feet, and in Yorkshire they are about the same, but seldom more than three or four hundred feet in either district, and in many instances very shallow. The steam-engine is not commonly erected in the collieries of these parts, unless, indeed, on a very small scale, and of a very imperfect kind. The *horse-gin* and *turn-wheel*, or *roller*, are the machines commonly used in these inferior collieries for the purposes of winding or lifting the coal. The horse-gin is the same kind of machine as that usually known by the name, and is generally worked by horses who have seen better days, and indeed now see no days at all, being blind, wind-galled, or spavined. The turn-wheel is the least expensive and most dangerous mode of winding. It is, in fact, nothing more than a common well-winch with a fly-wheel, which is wound by an old woman or boy, on whose equanimity the ascendants and descendants are entirely dependent.

The men and boys commonly descend and ascend by inserting one leg into a loop at the end of the pit-rope, and winding the other round the rope, to which also they cling with both arms and hands. Two men commonly go at one end of each of the two ropes, when the loops are used. When the baskets (corves) are employed, three or four, or more, may descend together. Eight persons may descend the Monkwearmouth shaft in a large iron bucket. The number of boys going up and down at one time is sometimes five or six, and they cling to the ropes with as much tenacity as possible, presenting the appearance of a string of onions. The men take the youngest boys on their knees, holding them fast, which, after work, is necessary, for they are sometimes asleep when they arrive at the top. A modern improvement in shaft-machinery is the substitution of iron frames (cages), sliding upon vertical rods or rails, which traverse the shaft perpendicularly; the transit of this plan is easy, steady and safe. In some collieries it is the practice to descend and ascend by the upcast shaft, which is in fact going down or up a long smothering chimney. We have descended three upcast shafts, each of more than a thousand feet in depth. The celebrated Monkwearmouth shaft is an upcast, and we shall not readily forget our descent of this, during the whole of which we were subjected to the suffocating vapours of the smoke of the flaming furnace at the bottom, and of the vitiated return air. The ropes of this shaft cost £550 per pair, and weigh 5¼ tons, only lasting, however, about ten months. Many of the ropes in these collieries are flat, and all are of a superior character. The chief danger in ascending is that of being drawn up too high and over the pulleys upon which the ropes run, and which are erected upon wooden frames over the

shaft. A bell is hung, by mechanical contrivance, when the men arrive near the surface, but this has sometimes failed; and in the summer of 1842, a pitman was killed by such a failure at a pit in county Durham.

The method of excavating the coal from the mines is not always the same in different places, but may, in a general sense, thus be described:—The pit is either level or sloping, according to the seam of the coal, and the process of excavating it furnishes material for sending to the surface up the shafts. A pit may vary from three or four to six feet in height, from the floor upwards; the roof, which is a hardish part of the strata left, being supported by pillars consisting, for the greater part, of unexcavated coal. Sometimes wooden props are used, but these are less safe than the substance of the coal. It may easily be supposed, that great care is required in leaving a sufficiency of these natural props; for cases have been known in which the superincumbent pressure has forced down the roof, and the land on the surface, with houses upon it, has sunk.

In excavating, hewers are employed to dig out with picks the masses of coal; and as they proceed in their labours, they cut out evenly-formed apartments, or galleries, all connected with each other, and divided by the rows of pillars which it has been necessary to leave standing. In some instances, the miners must recline or stoop to effect their purpose; and when we remember that they are incommoded with water and foul air, and working in darkness only illuminated by feeble lamps, it must be allowed that their occupations are irksome, and far from being either pleasant or safe. Other persons remove the coal as it is dug, in some cases by means of small wheeled carriages, which they draw, and in others by carrying it in baskets on their back. Being in either way removed to the bottom of the shaft, it is there put in the buckets, or corves, and wound to the surface.

Ventilation of Coal Mines.

The temperature in coal-pits varies in general from sixty to seventy degrees in deep mines. In one of the Hetton pits, it is sixty-six degrees at the shaft bottom and seventy degrees in the workings. In the deep Monkwearmouth pit, it ranges from seventy-eight to eighty, and even to ninety degrees. The Newcastle coal-pits generate gases more largely than any other. The chief component part of inflammable pit-gases is carbureted hydrogen gas, mixed with unequal quantities of olefiant, carbonic acid, and nitrogen gases. They exhibit a very different degree of inflammability when mixed with atmospheric air, according to the different proportions they contain of nitrogen, carbonic acid, and olefiant gases. The two first gases diminish, the last increases, their inflammability. The most readily explosive mixture of this inflammable compound with common air is one measure of the gas to seven or eight of air.

The great objects of ventilation are to dissipate the noxious gases issuing from the coal, frequently at all pores, and to supply the miners with fresh air. Its agent is the difference between the weights of two columns of air, one of which is at the natural temperature, and the other rarefied by the heat of a furnace. (See article VENTILATION). Both by means of doors in the galleries, and the furnaces erected for the purpose, ventilation is carefully attended to, so that a current of fresh air is almost always playing along the passages. In cases where it is presumed that the return or escaping current of air is so impregnated with the inflammable gases of the mine that it would take fire by coming into contact with the flames of the furnace, the air is carried over the furnace through a close brick-work channel (termed a dumb furnace), which opens into the upcast shaft *above* the fiery furnace; thus the heat of the fire is made to produce the draught, while the flame does not communicate with the vitiated return air. One of the very highest rates of circulation afforded a result of 59·030 cubic feet of air per minute coursing through the pit, which amount was subdivided into eleven different currents, being an average of 5·366 cubic feet to each current. The ordinary circulation is much below this, but the higher it is raised, the safer and fresher the pit.

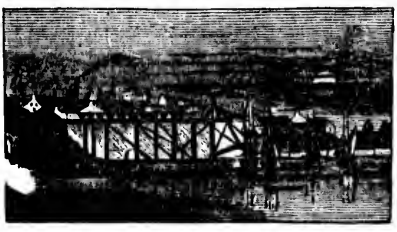
Notwithstanding all the precautions used, explosions of foul air and accidents will occur. No colliery district, we believe, has been more fertile in explosions of a terrific character than the Newcastle coal-field. At the very lowest calculation, no less than 1500 lives have been sacrificed in or about the collieries of the Tyne and Wear, in little more than the last forty years, and the greater portion of these have been lost by explosions of inflammable gases. Mr. Leifchild describes a catastrophe of this nature, the effects of which he witnessed, that occurred in April, 1841; and by this calamity thirty-two persons were killed, some of them being fearfully mutilated or scorched to cinders. The acknowledged cause of this explosion, and of many others, was the temporary neglect of the little boy who kept one of the most important doors in the pit. It is supposed that he left this door for a short time to play with another doorkeeper, or *trapper*, and consequently the current of ventilation became deranged. Whenever such a derangement takes place, the contact of a candle-flame explodes the pit either wholly or partially, and with more or less havoc. In this instance the pit was shattered to a great extent, but in others it is sometimes not much broken up. In 1839, an explosion occurred in which fifty-one persons were killed; and in 1835, at Wallsend pit, 102 human beings were destroyed by one.

Very few persons are unacquainted with the nature of the *Davy-lamp*, or safety-lamp, invented by Sir Humphry Davy, and introduced to the miners in 1816. As shown in the adjoining figure, it consists of an oil-lamp enclosed in a wire-gauze cylinder, of which the apertures are extremely minute—a square inch of the surface containing 625 openings. Through apertures so small, flame will not pass, and the lamp may therefore be carried into the most explosive atmospheres without risk. Its safety depends upon the cooling agency of the wire-gauze, exerted on the portion of gas burning within the cylinder or lamp. When the fire-damp is to the air in the proportion of 1 to 5, 6, or 7, the cylinder is filled with the flame; but even though the wire-gauze should become red hot, the exterior air is not kindled. It is perhaps possible, by certain chemical arrangements, to force the flame through the gauze, if a strong current be employed, but no instance of such an event ever having occurred naturally in a mine is, we believe, recorded; and therefore the Davy-lamp in its original form is esteemed perfectly safe, notwithstanding the numerous *improvements* proposed for it. If the miners would always employ this safeguard instead of candles, there can be little doubt that fewer explosions would occur; but the feeble light which it affords renders it unacceptable, and men will actually, and without dispute, frequently risk their lives for the sake of a little more light and the avoidance of a little trouble. Many mines have been conducted since the introduction of this lamp, which, without it, must have been closed, and some have been re-opened that could not be worked in safety with the old *steel-mill*—a machine of revolving steel and flint, employed before the Davy-lamp in dangerous pits. This is especially the case in what are termed the pillar-workings of the pit, where the ventilation becomes more difficult, and in almost all pillar-workings the *Davy*, as the pitmen call it, is in requisition. In many pits a *locked* Davy is delivered to the pitmen, who return it before they leave the pit.

A considerable number of lives are lost, singly or in small numbers, by what may be considered as the ordinary casualties of mining, such as the fall of stone from the roof, which is a frequent cause of calamity. In the inferior coal-fields, numerous deaths occur by the breaking of ropes and shaft apparatus, all which are of a much more costly and durable character in the Newcastle collieries. And this leads us to speak of the ascent and descent of these pits.

Colliers.

The number of men and boys employed above and under ground in the Tyne, Wear, and Tees collieries, or what may be termed the Newcastle coal-field, approximates to 30,000, which may probably be the maximum. To speak more definitely, nearly 13,000 are engaged in the collieries on the Tyne (which are the oldest), 9000 in those on the Wear, the number in those on the Tees being uncertain. The pitmen appear to be a tolerably healthy race of men, of somewhat diminished stature, and of a rather peculiar bodily configuration. Their legs are sometimes bowed, and their backs rather bent, as the results of their constrained position in hewing the coal; while, as a set-off, their muscular development is considerable, and, being spare, they recover readily from accidents. The hewers earn, in fair times, from 18s. to 20s. per week, or more, and enjoy a cottage and fuel free of payment. The cottages are built in long rows, and form distinct villages. The lads and boys are also well paid, but the *putters* undergo in many instances very severe labour, which the oldest of them bear well, but it tells visibly upon the youngest. The education of the men, women, and boys, is very defective; few can read at all readily, and fewer still can write. They are, in fact, not long emerged from a state of semi-barbarism. Thirty years ago, their Sunday costume was remarkably gay and singular, and their manners equally so. At present, they may be considered to be, when viewed externally, a tolerably well-behaved, shrewd, hard-working, hard-feeding community—not long since, we might have added *hard-drinking*, but temperance societies are encouraged by them, and a considerable number of them are Methodists. A special government commission has inquired, during the year 1841, by means of visiting assistant commissioners, into the circumstances of the employment of females (none being found in the Newcastle pits) and children in coal mines. The results of this commission have occupied a large share of public attention; and Lord Ashley's bill, founded upon them, excludes females altogether from coal-pits, and limits the age of boys employed in them. It is very satisfactory to have ascertained that (lead mining excepted) all mines appear to be *capable* of being worked by men without any serious diminution of their health. The occupation may, by liberal and judicious management, be rendered far from disagreeable to those accustomed to it.



Surface-works—Consumption of Coal.

The surface-works at a coal mine are less complicated than those at the metal mines, where smelting has to be performed; still, they are frequently very extensive, and include steam-engines for drawing the coal, pumping the water, and also departments in which much of the apparatus connected with the pits is made and repaired. From the pits in the Newcastle and Durham districts, railways are laid in communication with the banks of the Tyne; and overhanging the river may be seen many of the terminations of these railways adapted for shooting the coal from the wagons on board the vessels lying ready to receive it. The apparatus suited for emptying the wagons into the vessels is called a *staith*, and one of these is sketched in the preceding figure.

The cost of coal on being raised from the pit is always very much below the selling price to the consumer, a large addition being made by the merchants through whose hands the article passes, in the shape of dues for freight, carriage, commission, &c. Good coal in Scotland may be had for about 10s. or 11s. per ton; but in London, the expense of the sea-carried Newcastle coal is enormous; the coal, in general, which originally cost 12s. to 14s. per chaldron, being raised to about 50s. to the consumer. Speaking of the abuses of the coal trade, Mr. M'Culloch, in his "Dictionary of Commerce," makes the following statements:—"Abuses have insinuated themselves into most departments of the business; and to such an extent have they been carried, that it takes, at this moment, a larger sum to convey a chaldron of coal from the *pool*, a little below London Bridge, to the consumers in the city, *than is sufficient to defray the entire cost of the coal in the north*, including the expense of digging them from the mine, their conveyance to the shore, landlord's rent, &c.! The following statement shows the various items that made up the price of coal to the London consumer in October, 1830, distributed under their proper heads. They have been carefully abstracted from the evidence before the parliamentary committees.

CHARGES UP TO THE TIME OF ARRIVAL IN THE PORT OF LONDON.

Coal Owner.			
Paid coal owner for coals		£0 14 0	
Deduct river duty paid by him for improvement of Sunderland harbour		0 0 3	
			£0 13 9
Coal Fitter.			
Keel dues, and fittage (including seven miles' water-carriage)		0 2 3	
Ship Owner.			
For freight, including insurance of ship and cargo, pilotage, seamen's wages, wear and tear of the ship and materials, discharging ballast, &c.		0 8 6½	
Municipal Dues.			
River duty, as above	£0 0 3		
Pier duty, lights, &c, paid by ship	0 0 5½		
		0 0 8½	
			0 11 8½
CHARGES IN THE PORT OF LONDON.			
Government Tax		0 6 0	
Municipal Dues.			
Trinity and Nore Lights, tonnage duty, Trinity-House for ballast, &c.	0 0 5		
Entries, &c.	0 0 2½		
Corporation of London metage	0 0 4		
Ditto orphans' dues	0 0 10		
Ditto meter's pay and allowance	0 0 4		
Ditto market dues	0 0 1		
Ditto Lord Mayor's groundage, &c.	0 0 0½		
Ditto land metage	0 0 6		
Ditto undertaker	0 0 1		
Coal-whippers	0 1 7		
		0 4 4½	
Coal Factor.			
Factorage and *del credere* commission		0 0 4½	
Coal Merchant.			
Buyer's commission	0 1 0		
Lighterage	0 2 0		
Carriage	0 6 0		
Credit	0 2 0		
Shoorage	0 1 3		
Add for even money	0 0 3		
	0 12 6		
Add for discount, *scorage*, and *ingrain*	0 2 2½		
		0 14 8½	
			1 5 8½
Making the price paid by the consumer			£2 10 7½

Which is thus apportioned:			
Coal owner for coal - - - -	0	13	9
Ship owner, &c., for voyage to London	0	11	5½
Government duty, corporation charges and London coal merchant - -	1	5	5½
	£9	10	7½

Of these charges, but little reduction need be looked for in those incurred in the rivers Tyne and Wear, and in the rate of freight; and as the government duty of 6s. per chaldron has been abolished, the charges that admit of further reduction are the municipal dues, and those attending the delivery of coal to the consumers; and in these, certainly, there is ample room for retrenchment.

The most important item, in those forming the charges in the port of London, is the fee of the *coal-whipper*, or coal-heaver—that is, the deliverer of the coals from the ship to the barge or lighter. This fee is about 1s. 7d., and is at least *five* times as great as it ought to be. At Newcastle and Sunderland, the filling of a chaldron of coal into the wagon costs 1½d. to 1¾d.; and admitting that to raise coal from the hold is a little more difficult, still, if 4d. were allowed, it would be a most liberal payment. But the truth is, that this item should be struck off altogether. It is occasioned by *a regulation peculiar to the Thames, which prevents the crews of colliers from performing this indispensable part of their peculiar duty.* In the outports, to which, luckily, this preposterous regulation does not extend, the crews act as coal-heavers, and they do so without either asking or obtaining additional wages. And there certainly is no reason whatever for supposing that the case would be materially different in the port of London, were it not for the regulation referred to. In 1829, the total amount of money paid to the coal-heavers was £107,566, 13s.; of which at least £90,000 may be saved to the citizens by simply *allowing* the crew to perform the function of coal-heavers.

The consumption of coal in Great Britain, according to a statement made by Mr. Taylor, an experienced individual in the coal trade, and laid before a committee of the House of Lords, was as follows:—

The annual vend of coal carried coastwise from	Tons.
Durham and Northumberland is - - - - -	3,300,000
Home consumption, say one-fifth - - - - -	660,000
	3,960,000
Which quantity supplies 5,000,000 persons; and supposing the whole population to amount to 15,000,000, the estimate will therefore be - -	11,880,000
Consumed in iron-works - - - - - - -	3,000,000
Annual consumption of Great Britain - - - -	14,880,000
Exported to Ireland - - - - - - - -	900,000
Total - - - - - - - - - -	15,780,000

Since this statement was made, the consumption is believed to have greatly increased, and, including the coal exported to Ireland and to foreign countries, the total quantity raised annually is not less than 23,000,000 of tons, the price paid for which is reckoned to be eight millions sterling a-year.

SALT MINES.

Deposits of salt are chiefly found amongst secondary rocks; and rock-salt is almost invariably accompanied by clay, sandstone, and gypsum (from which last plaster of Paris is made, either above or below it, sometimes both; and the countries containing salt deposits are for the most part flat. It is found either in the form of rock-salt, or disseminated in brine springs in many countries; but some, as the capitals of Hindostan, are so destitute of it, that, in the shape of stamped cakes, it once passed as money, according to some authorities.

Perhaps the most extensive deposition of rock-salt in the world is found at Wielitska, near Cracow, in Poland. It has been worked as a mine since the year 1251, and its excavations are said to extend more than a league from east to west; the salt produced being of an iron-gray colour, in which are enclosed cubes of a pure white. After being let down by a rope for 230 feet, the visiter is led through galleries perfectly dry, and of considerable height and breadth, until he arrives at two chapels composed entirely of salt, and hewn out of the solid mass. Images, as well as pillars and ornaments of the same material, adorn the place, and reflect the rays of light issuing from the lamps of the guides, producing a beautiful and novel appearance. Descending lower by ladders, the visiter finds himself in an immense hall or cavern of salt cut with great regularity, and many hundred feet in length. A thousand persons might dine in it without inconvenience; and when illuminated by flambeaux, its splendour is not inferior to that of a palace hall.

There are some extensive beds of rock salt in England; two found in Cheshire are known to extend a mile and a half north-east and south-west, and upwards of three-quarters of a mile in width. The surface of the lower bed is about 220 feet from that of the ground, and this bed has been penetrated to the depth of 132 feet, without any appearance of its base. Some of the upper strata in this series are very porous, and permit 360 gallons of water to rise through them per minute, a circumstance that greatly impedes the sinking of pits. The salt of these mines is commonly of a reddish hue, and is often so hard that the blast by gunpowder is necessary to extract it. The lower portion of the lower bed is the purest, and in it occurs considerable cavities, sometimes 16 feet high. The mines are worked by galleries, masses of salt being left as pillars to support the roof. When illuminated by candles, numerously fixed on the sides, the effect produced is exceedingly brilliant. Of the Cheshire mines many yield 16,000 tons of salt per annum for home consumption, and 140,000 tons are annually exported from Liverpool.

Salt is also obtained in our own country from brine springs, the chief of which are situated at Droitwitch, in Worcestershire. They are four in number, all situated within a square furlong, and seem to issue from a bed of rock-salt. The quantity of brine rising from these pits is immense; and although that which is used bears but a small proportion to that which runs to waste, nevertheless the quantity of salt annually made from these four pits, or springs, is about 16,000 tons, two-thirds of which are consumed in England. The brine is perfectly limpid, and contains about one-third its weight of salt, which is separated from it by evaporating processes.

Salt Mine.

Among the most interesting accounts of the English salt-mines is that of Sir George Head, in his "Tour through the Manufacturing Districts of England in 1835." While at Northwich, he visited the Marston

pit which has been worked for a period of sixty years, and may be considered inexhaustible. "Having waited (says he) with my conductor a few minutes, till the engineer had put a little steam on, we both stepped into a round tub, and, standing upright, holding by the chains, were let down very easily. I cannot express the delight I felt at the scene around me, which surpassed any thing I had anticipated: creating those sensations I remember to have felt when first I read of the pyramids and catacombs of Egypt. Here was a magnificent chamber, apparently of unlimited extent, whose flat roof presented an area so great that one could not help being astonished at its not having long since given way. Yet there was no apparent want of security, it being sound and durable, as if formed of adamant. Here and there pillars, in size like a clamp of bricks in a brick-field, tendered their support, presenting to the view an array of objects that broke the vacancy of uniform space. My idea of the extent was, as if an area, equal to the site of Grosvenor Square, were under cover. In the mean time, the glistening particles of crystal salt on the walls, and the extreme regularity of the concentric curved lines, traced by the tools of the workmen, were very remarkable. Occasionally, the mark of the jumper-chisel was observable where recourse had been had to blasting the solid rock. I made a few blows against the side of the mine with one of the heavy pointed pickaxes in ordinary use, and found it as hard as freestone. Under foot the whole surface was a mass of rock-salt, covered with a thick layer of the material, crushed and crumbled to a state that exactly resembled the powdered ice on a pond that has been cut up by skaters.

"Experiments have been made by boring to a depth of seventeen yards, but they have neither perforated the rock-salt, nor do they at present know the thickness of the stratum. The height of this excavation is about fifteen feet, within which space the salt is estimated as being of the best quality. Above, it is somewhat inferior. I was informed that thirty-five thousand tons of salt were annually dug out of the different levels, and that the area of the whole together amounted to forty-eight statute acres. A considerable quantity of this salt is exported to Prussia.

"At one part there is a vista of two hundred yards in length, which has been dignified with the name of Regent Street. Here occasionally pic-nic parties are celebrated; and on a large table of coarse deal-boards, were the evidence of deeds of wassail performed at a feast of this description, which had taken place a few months before. An empty jug and sprig or two of evergreen lay forlorn and neglected, while I observed natural tokens, indisputable and abundant, of mice that had joined in the revelry. These little animals invariably establish their residence under ground, wherever men lead the way. At the coal-pits of Whitehaven, for instance, they are plentiful at a depth of one hundred and forty fathoms, being brought there originally, probably, in bundles of horse provender. Were it possible, within this mine, to provide against the inconvenience of smoke, there not being any efficacious outlet for its egress, I cannot conceive a place better calculated, with proper appendages and decorations, to give effect to a fête on a magnificent scale.

"Every one who descends this pit ought to bring a good Bengal light. For ordinary purposes, we had recourse to common tallow candles.

"Having wandered a long way, through vast space, but almost in darkness, we came again to the foot of the shaft. Previous to ascending, my guide went a little out of the way, in order to carry a pail of water to an old horse, who, as the workmen were absent for the whole day, was standing by himself in perfect solitude, and, till we came, without any light at all. Alone and in darkness, he must, poor fellow, from necessity, live for many hours in the year, and pass thus neglected a very considerable portion of his time. He loudly expressed his gratitude for the water, and I took an opportunity of examining his condition while he was drinking. I was surprised to find it particularly good; unlike the flaccid though fine-coated state of horses in coal-pits, his was that of a firm crest and perfect health, a fact I attribute especially to the salubrious effects of the salt. His stall was comfortable and dry, as was the whole space below contained in this pit. I saw no appearance whatever of water during the whole time I was below.

"The salt, after being prepared by the solution of the rock, and evaporation, is formed by wooden moulds, with holes at the bottom, to allow the remaining water to pass through, into cubical blocks, and in this state shipped either by the river Weaver and canal to Western Point, and thence into the Mersey, or by the canal southward.

"A considerable quantity is prepared from the brine springs, some of which are so strongly saturated as to hold in solution the greatest possible quantity of salt. To the water of some of these springs rock-salt is added while boiling in the pans. From these springs the water, or brine, is raised by a shaft sunk, and a pump worked by an ordinary steam-engine."

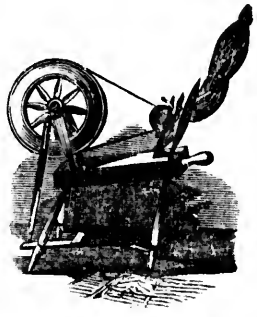
MISCELLANEOUS ARTS AND MANUFACTURES.

TEXTILE FABRICS.

All kinds of cloth formed of spun or woven threads fall under the title of textile fabrics, and the manufacturing of these, in the departments of linen, cotton, woollen, and silk, is now the most important branch of industry in Great Britain and Ireland.

LINEN.

The fabrication of linen cloth, to which we may first advert, commences by the preparation and spinning of the raw material, lint. Lint is the fibrous bark of the flax plant, which grows in temperate climates to a height of from three to four feet. When ripe, it is pulled and steeped to soften the substance of the stalks; on being dried, it is *skutched*, or bruised, to free the fibres from the waste of the stalks. It is next *hackled*, or cleaned, by being drawn over and among sharp iron spikes; the refuse in hackling is called *tow*, and is employed for coarse sacking. The hackled lint is a collection of fine smooth fibres, ready for being spun. The mode of spinning is now very different from what it once was. In ancient times it was customary to spin by the distaff, an exceedingly simple apparatus, consisting of a spindle, or bobbin, twirled by the twisting of the lint, as it came from a staff of lint held by the operator; the finger and thumb were the sole instruments for twisting. A female could not twist a spindleful of thread, though engaged a whole day in the labour. This rude process was at length superseded by the introduction of a machine called the *spinning wheel*, a representation of which is given in the annexed engraving. A female sat with her left hand towards the *rock*, or staff, on which the lint was placed; her right foot moved the paddle-board below, and this affecting the upright crank, turned the wheel. A band communicated to the spindle, and on this the thread was fed from the rock. In drawing out the lint, the finger and thumb were frequently wetted by touching the lips, and this had an effect in consolidating and smoothing the thread, which no purely mechanical process has since been able to imitate. Spinning in this manner with the wheel formed a very common employment for females, particularly those who were aged, and whose time was of little or no value. Although the motion of the wheel was rapid, in comparison of the feeble operation of the distaff, the process was very insufficient, except for home-made linens, and something very different was required for manufactures conducted on a large scale.



The introduction of machinery in the manufacture of cotton led to the application of similar mechanism in the linen manufactory; and for many years hand-labour has been entirely abandoned. All steps in the preparation and spinning of the flax are on a large scale. The flax is imported in vast quantities from Holland and other countries, and is dressed and spun in factories at Leeds, or some other great seat of manufacture. The machinery is extremely beautiful and ingenious, and the making of it alone is a principal trade. On being brought to one of these factories, the flax is from 30 to 36 inches in length, and the first step "is to take a quantity of it, and divide it into three lengths; the part nearest to the root being coarse and strong, the middle part fine and strong, and the upper part still finer, but not so strong. Thus each length being divided into three, and all those of the parts from the bottom, middle, and top, being collected into separate heaps, three distinct qualities of thread are to be formed.

"The separation of these first lengths into three is effected by a very ingenious machine, consisting of a number of vertical wheels, and a centre wheel, furnished with a kind of teeth. The length of flax is held transversely against these wheels, and is passed between two, one on either side, while the centre wheel tears it across, by separating but not cutting the fibres. This cuts off the bottom part of the length of flax; the remaining part is then submitted to the same process, and the middle part cut from the top, each sort being collected in one heap, so as to effect a separation of the three qualities above named. Each division, from what has been before seen, will be, of course, about ten or twelve inches in length. In the next stage, these lengths are fixed in a sort of vice at one end, spread out to a breadth of six or seven inches; several of these are fixed on a sort of revolving drum, at distances of about a foot from each other, their unsupported ends falling on an internal drum covered with strong cards, the internal drum revolving one way with considerable velocity, and the external in the opposite direction rather slowly, and thereby the lengths of flax are rendered very smooth and straight; they are then dexterously removed by an attendant, generally a girl, and placed with their other side downwards in the next machine, and again removed. It should be remarked, that these only pass over the upper part of the internal drum; for it is obvious, if they passed below, their weight would cause them to fall from and not upon the carding roller.

"These several operations being performed, the next step is to place these pieces of flax, one just reaching the other, on a feeding cloth, and by the hand slightly to combine their ends; the first end is then passed between two card-rollers, or rollers furnished with teeth, which carry the whole forward, while the extreme end passes between two rollers of iron, the latter moving with considerably greater velocity than the former, in some cases 30 to 1, and consequently the flax is now lengthened 30 to 1, and its thickness reduced accordingly. In passing from the roller the flax receives no twist, but comes out flat, and of about the breadth of narrow tape, and is caught in a cylindrical tin can placed below to receive it; when a certain length has been received, sufficient to fill the can, a bell rings, an attendant breaks the flax, removes the can, and places another. The flax in the full can is then taken to another machine, where it is again lengthened, and so on to different degrees, according to its intended fineness. After it is properly reduced in the flat state above described, it receives in its last stage a very slight twist, so as to reduce it to a round thread. It is then received on bobbins, and is in a proper state for spinning; the process of which differs only in degree from that described in relation to the cotton manufacture."*

The yarn produced in these spinning-mills is purchased

* Encyclopædia Metropolitana, article *Manufactures*.

cy manufacturers, who employ weavers to convert it into the various fabrics of linen, damask, and cambric.

Weaving.—This is an art of great antiquity, and has undergone little improvement till recent times. The process is founded on a simple principle. A certain number of threads drawn out alongside of each other, constitute the *warp*. This is evenly wound on the beam of a loom, and is thence extended to another beam at the opposite end. The warp is two threads in depth, and by means of heddles, and other apparatus, these are caused to rise and fall so as to cross each other. Every time that the threads are opened, a shuttle containing the *woof* or *weft* is thrown across from one side of the warp to the other, and the thread of woof thus left is driven home by a lay, or properly by a comb-like process of reeds, which the lay brings forward. A reversal of the warp makes another opening, which is similarly crossed by the shuttle, and so on, the fabric gradually assuming the character of cloth. Plain cloth of all descriptions is formed by this species of operation. *Twilled* cloth is formed by causing the thread of the woof to pass alternately over four and under one of the threads of the warp, and performing the reverse in its turn. Jeans, dimities, serges, and other fabrics, are thus woven. For this, and all kinds of ornamental weaving, an expensive, or at least complex harness is required. The machinery for weaving lace and gauze is very ingenious and beautiful, but would require to be examined minutely to be properly understood.

Bleaching and Calendering.—These processes follow that of weaving, and in both there are now great improvements. Bleaching linen is performed by spreading the cloth on a bleaching-green, where an abundance of water can be obtained, and exposing it to the action of the atmosphere in a wet condition. Some submit their cloths to artificial bleaching by chemical detergents, but these are allowed to be somewhat injurious to the texture. With respect to brown linen, "being first unfolded from the firm and compressed shape in which each *piece* or web is received from the manufacturer, it is cast, loosely knotted, into a wooden boiler capable of containing some two or three hundred pieces, and nearly filled with a weak solution of potash or barilla. After the linen has been boiled in this liquid for several hours, it is removed from the boiler by a crane and net-work of rope, and almost immediately transferred, in separate quantities, to the *wash-mills*. Here it is placed in a trough, through which jets of spring-water are constantly passed, and kept fully exposed to the action of the water by means of two large beams suspended above the troughs, and termed *feet*, the lower ends of which are alternately drawn back and permitted to fall against the linen with considerable force. This motion is produced by the revolving of a cylinder situated directly beneath, and having projecting spars which catch and raise, at intervals, the extremity of the feet. From the wash-mills the linen is removed to the green, where it is carefully spread upon the grass, the several pieces being attached together, and their ends secured to the ground by small wooden *pins*. After remaining two or three days upon the grass, it is again brought to the bleach-house, to be boiled and washed as before. The operations of boiling, washing, and spreading upon the green continue, thus successively repeated, till the linen has fairly assumed a whitish hue, when two additional forces are introduced. The first is that of passing the linen through the *rub-boards*. These boards, which are fixed in a frame, and moved by simple machinery, have portions of their inner surfaces furnished with plates of *lignum-vitæ*, or other hard material, completely channelled with narrow parallel grooves, the plates of the upper board being placed immediately over those of the under. Between these plates the linen, having been first plentifully soaped, is slowly passed, so that the entire web is submitted to the friction. The second process is that of steeping, for a certain number of hours, in *rieves*, or cisterns, containing water acidulated with sulphuric acid. After the introduction of the additional processes, the earlier continue unchanged, excepting that the use of the former alkalis in boiling is abandoned, soap being now employed.

"By these several means, the bleaching is at length completed, when the *finishing* or prepairng for market immediately begins. The linen is first starched and blued, after which it is suspended in a *drying-loft*, where it is exposed to the air till completely dry. It is then taken down and stretched, and submitted to the *beetles*. These are a succession of weighty wooden billets, ranged in a frame, above a slowly-revolving cylinder, round which the linen is wound. The machinery being set in motion, the billets are raised and successively dropped, with great rapidity and force, on the cylinder beneath. This is continued for several hours, and the operation repeated till the fabric is sufficiently compressed, and the requisite smoothness obtained. The linen is then *lapped*, or folded, and sent to the assorting-room. Here each piece is carefully measured, again firmly lapped, and subjected to the pressure of an hydraulic-press. The peculiar stamp of the merchant is finally applied, and the linen is ready for the market."*

Hemp is a coarser plant than flax, and its fibres, when skutched and hackled, are spun into yarn suitable for being woven into canvas or bagging. The manufacture of these fabrics has been long settled at Dundee and the adjoining districts, to which the raw material is readily imported from the continent of Europe. Ropes, cordage, and twine, are made from the same strong material.

COTTON.

Cotton is the wool produced in the pods or fruit of the cotton plant, which is indigenous to all the tropical regions of Asia, Africa, and America. When the pods are ripe, they burst and disclose the cotton wool, mixed with seeds. After the cotton is gathered, it is exposed to the rays of the sun till it is perfectly dry; the seeds are then separated by a peculiar skutching apparatus, and being picked and compressed into bales, is in this state sent to Europe. The chief seats of import are Glasgow and Liverpool, where it arrives in large oblong bales, and in this state is carted off to the factories in which it is to be spun.

The relative value of raw cotton depends on the length of its staple, the delicacy of its fibre, and its freedom from dirt and seeds. The cleanest, we believe, is the American; but however careful its preparers have been, "it never comes to England in a state fit for immediate use; some seeds remain after the most careful cleaning, and the pressure to which it is subjected in packing, forms hard matted lumps, and some of the coarser and heavier wool is unavoidably mixed with that of superior quality. The first operation in the process of manufacture is consequently the cleaning of the cotton. It is put into the blowing-machine, where the cotton is torn open by revolving spikes, and subjected to the action of a very powerful blast, produced by the rapid turnings of a fan; the light wool is thus blown to some distance from the heavier portions—the dirt, seeds, &c. This process is continued in the skutching-machine, where the cotton is beaten by metallic blades making from 3000 to 5000 revolutions in the minute; these completely open the fibre, and separate the fine wool from the waste, which falls to the ground through a frame of wire-work.

"The cleaning process is generally called *willowing*, which is either a corruption of *winnowing*, or perhaps derived from the willow frames on which the cotton was cleaned by beating, before blowing-machines were invented. Previous to this improvement, the cotton was

* Mr. and Mrs. Hall's Ireland. London: 1842.

placed upon willow-hurdles, or upon cords stretched over a wooden frame, and then beaten with smooth switches. This operation, technically called *batting*, though very fatiguing, and we believe unwholesome, from the dust, &c., which was scattered about, was usually performed by women; it is now very rarely practised, except when some remarkably fine cotton is required for the manufacture of lace, when it is of importance to preserve the length of the staple, which might be injured by machinery.

"The Hindoos open the fibres of their cotton by a bow similar to that which hatters use in raising wool; the same contrivance appears to have been employed in America, for we find the term *bowed cotton* still employed in the language of commerce. Judging from its effects on wool and fur, we should think that the bow is an effective machine for cleaning and opening the fibres, but it would be far slower and less productive than the willow.

"When cleaned, the cotton is brought to the lapping or spreading-machine, where a given weight of the wool is spread over a determinate surface of cloth, and being then slightly compressed by a cylinder, it is lapped round a cylindrical roller, so as to be in a fit state for feeding the carding-machine. It is a singular fact, illustrating the accuracy with which machinery works, that the weight of the cotton spread on the cloth in this process regulates the fineness of the thread ultimately produced, and that there is rarely any great amount of error in the calculation.

"The next process, that of carding, is one of the most beautiful in the whole of the cotton manufacture. An explanation of the object to be attained is necessary for those who have not paid some attention to the subject. In order that any material should be spun, that is, should have its fibres twisted together, it is essential that these fibres should be straight and parallel with each other. After having been subjected to the action of the willow, the fibres of the cotton are blown about in every direction, and, if compressed, would be entangled with each other. This, which is the object to be gained for the process of felting, is precisely that which must be carefully avoided for spinning. In order to straighten the fibre, the cotton is made to pass between cards or brushes of wire, one of which is stationary, and the other in motion; the wire teeth catch the fibres, and, by their continued action, pull them nearly into parallel directions.

"This process was anciently, and in some rural districts both of England and Ireland is still, effected by hand-cards, which might be described as two brushes with handles, having short wires instead of hairs. The labour was usually performed by women, who placed one of the cards on the knee, holding it firm with the left hand; and then spreading the cotton or wool in small quantities over the wire, drew the other card repeatedly over it with the right hand, until the fibres were deemed sufficiently straight. When thus prepared, the cardings were taken off in a roll by the hand, and laid so as to be united into a continuous roving by the spinning-wheel.

"The first great improvement in this process was to fix one of the cards to a table, and suspend the other from the ceiling, so that the workmen could move it without having to sustain its weight. Such a contrivance allowed *stock-cards*, as they were called, to be made of double the size of hand-cards, and consequently to double the quantity of work produced. We have seen stock-cards in some rural districts, where there is still a domestic manufacture of woollens; but they are daily becoming of more rare occurrence. In nearly all manufactures, they have been superseded by the cylindrical cards, which Mr. Baines has shown to be the invention of Mr. Lewis Paul of Birmingham, about the year 1748. About 1760, the process, which seems to have been either neglected or disused, was revived by Mr. Morris of Wigan, and applied to the carding of cotton. The perfecting of the machine has been claimed for Sir Richard Arkwright, but the originality of his invention has been very fiercely contested. Without entering into the controversy, we shall proceed to describe briefly the machine in its present state.

"The carding-machine has the appearance of a cylindrical box, into which cotton is given by the roller, round which it was wrapped in the spreading operation. Its wooden covering is a series of narrow panels; and if one of these be lifted, it will be seen that each of them is a card, and that a cylinder covered with cards occupies the interior of the box, between which and the panel-cards the cotton is rapidly passed. At the opposite side of the box is a second cylinder, the cards on which, instead of being placed horizontally, are wound spirally round the cylinder, which is called a *doffer*, so as to remove the carded cotton in a continuous fleece. The cotton is slipped from the doffer by the action of a slip of metal, finely toothed like a comb, which, being worked against the cylinder by means of a crank, beats or brushes off the cotton in a fine filmy fleece. The cloud-like appearance of the carded cotton, as it is brushed from the doffer, or finishing cylinder, by the crank and comb, is singularly beautiful—a breath seems to disturb the delicacy of its texture, and to the touch it is all but impalpable. The filmy fleece is gradually contracted as it passes through a funnel, by which it is forced to assume the shape of a roll or sliver. It then passes between two rollers, by which it is compressed into the shape of a ribbon of considerable tenacity, in which state it coils itself up in a deep tin can.

"Looking at the various parts of this interesting machine, the attention is first engaged by the feeding cylinder, which supplies the cotton to the cards more regularly and continuously than could be effected by hands. The successive cards on the concave and convex cylinder are seen to subject the wool to several successive cardings at each revolution of the wheel; and to prevent the necessity of stopping the machine to remove the carded cotton, it is stripped off by the doffer, which removes the cotton, not in successive portions, but in one continuous fleece. Again, the removal of this fleece from the doffer, which would be both tedious and imperfect if attempted by hand-cards, is completely accomplished by the simple agency of the crank and comb.

"Carding is not the only operation employed to straighten the fibre of the cotton. It may easily be conceived that the teeth of the cards will frequently lay hold of a fibre by the middle, and thus double it together, in which state it is unfit for spinning. This evil is corrected in the drawing-frame—an important part of the spinning machinery, for it executes work which could scarcely have been effected by human hands. The essential parts of the drawing-frame may be easily understood from description. Each drawing-head consists of three pairs of rollers, the upper one of each pair being smooth and covered with leather, the lower being fluted longitudinally. They are placed at a distance from each other, which is regulated by the staple of the cotton; that is to say, the distance between each pair of wheels is generally a very little more than the length of the fibres subjected to their action. The loose ribbon formed by the carding-machine is pulled through these rollers, and as they revolve with different velocities, the fibres pull out each other, and reciprocally extend each other to their full length.

"But a not less important object of the drawing-frame is to equalize the consistency of the cardings. One carding, notwithstanding all the precautions that have been taken, will be found to have more or less of substance than another, and it is necessary to counteract this inequality by combining several of the carded ribbons, technically called *card-ends*, into one sliver. Eight card-ends are usually brought to the first drawing

head, and after passing through the rollers, they combine to form one sliver of the same density as each of them separately, thus increasing eight-fold the chances of uniformity in the sliver. Four of these slivers are again subjected to the same process, and thus the chances of uniformity are two-fold those of the original card-ends; and this is continued until the last sliver may be regarded as containing parts of 300 card-ends; but for very fine spinning, the doubling of the fibres, as the process is called, is multiplied more than 60,000 times.

"The drawing-frames are fed from the tin cans containing the card-ends, and the chief duty of those who attend them is to mend or piece the feeding slivers when one of them is broken, or when one of the cylindrical cans is exhausted. A contrivance has been recently introduced to abbreviate this labour; a cylindrical weight is made to fall at intervals into the receiving can, and by pressing down the sliver, to force it to hold more than double the quantity which it would contain if the sliver were left to coil itself loosely. In the mills for fine spinning, great attention is paid to this process, because any defects left by the drawing-frame cannot be cured in subsequent operations. The labour of attending to the machines is the lightest in the cotton-mill, but there are few parts which require more vigilance and care.

"The next operation is the making of a roving or thin sliver, about the thickness of a candlewick, and giving it only so much of a twist as will enable it to hold together. The attenuation of the sliver is accomplished by rollers acting in the same way as in the drawing process, but various contrivances have been devised to give the roving just so much tension as is necessary, and no more. Arkwright invented the can-roving-frame, in which a slight twist was given to the roving by making the receiving-can revolve upon a pivot. It was necessary that the rovings, after this operation, should be wound off upon bobbins, a process injurious to their delicate texture; to obviate this evil, the jack-frame, or jack-in-the-box, was contrived, which wound the roving on a bobbin as it received its twist, instead of leaving it to coil in the can. At present, the process of roving is generally performed by the bobbin and fly-frame, an ingenious piece of mechanism.

"It is not necessary to enter into any examination of the many ingenious contrivances which have been devised to render the roving-machines more perfect and automatic; the reader will best appreciate the difficulty of the operation, by bearing in mind that the process of twisting by the spindle, and winding on the bobbin, though connected in fact, are quite independent in principle, and that there is therefore a necessity for the nicest adjustment, in order that the one should be accommodated to the other.

"Twist of low numbers, called water-twist, because it was originally worked in Arkwright's water-frame, is spun by the throstle, a machine probably deriving its name from its singing noise. It is in principle nearly the same as the drawing-frame which has been just described; it extends the rovings by the action of rollers into slender threads, and twists them by the rotation of spindles and flyers. The machinery, however, is far more simple, because the hard-twisted throstle thread does not require such tender manipulation as the delicate roving."

The most interesting part of the manufacture is mule-spinning, which is more common than throstle-spinning. "Let the reader," continues our authority, "imagine himself in the room, a part of which is represented in the accompanying cut, and it is probable that the circumstances worthy of his notice will present themselves in nearly the following order:—He will see a carriage about a yard in height, and of very considerable length, varying in different mills, bearing a row of spindles between its upper rails; it has generally three wheels which traverse on the same number of iron guiding bars, so as to allow of its drawing out to a distance of more than four feet from the stationary frame; as it

recedes from the frame, it draws with it and elongates the threads, or rather rovings delivered to it through rollers, by a series of bobbins in the creels or stationary rails. The threads, as they are elongated, are twisted by the spindles; and should any of them break, it is the duty of a boy or girl, called a piecer, to join the disunited ends as the carriage moves from the upright frame. A girl in the act of piecing the yarn is represented in the cut. When the carriage has receded to its full extent, the spindles continue to revolve until the requisite quantity of twist is communicated to the yarn. The spinner then causes the spindles to revolve backwards, until he has unwound the portion of thread which has coiled spirally round it from the point to the nose of the cop, and at the same time he lowers a faller wire, supported by hooks, as seen in the cut, so as to regulate the winding of the yarn on the cop in a proper spiral. There is great nicety required in regulating the pushing back of the carriage, for it is necessary that its rate of travelling should be commensurate with the revolution of the spindles. Three simultaneous and delicate movements have thus to be effected by the spinner as the carriage returns; he must guide the faller wire so as to insure the regular winding of the yarn on the cop; he must regulate the rotation of the spindles, of which there are often a thousand to one mule; and he must push the carriage at such a rate as to supply precisely the exact amount of yarn that the spindles can take up.

"The little piecers can only take up the ends when the carriage is within a foot or two of the delivering-roller, and they have therefore an interval of rest, while the carriages traverse backwards and forwards. The spinner, too, has a brief respite while the carriage is moving outwards from the frame. The time taken to make a stretch, that is, to draw out a thread equal in length to the range of the carriage, increases with the fineness of the yarn, and varies, also, according to the completeness of the machinery and the skill of the operative. The breaking of the threads depends not merely on the machinery, but to a very great extent on the atmosphere and temperature. We were in a mill during the prevalence of a sharp drying east wind, and found that it produced such an effect on the fibres of the cotton, that the threads broke faster than the piecers could mend them, and that the spinning of very high numbers at such a time was all but impossible. The rooms in which fine yarn is spun are kept at a temperature of 70 to 80 degrees, which is not so high as to produce much inconvenience."*

By the processes now described, the cotton has been attenuated into fine yarn on bobbins, and is now ready

* England in the Nineteenth Century—Lancashire. London How and Parsons. 1842.

for being *warpea*, or made into webs for the weaver. Formerly, all was wove by the hand; but the introduction of the power-loom, by which the work is altogether done by machinery, has superseded hand-loom weaving, except for some particular fabrics. "In one respect," observes the above authority, "the power-loom has a very obvious advantage over the hand-loom; the batten, lathe, or lay, to which the reed is attached, drives home the weft to the rest of the web, after it has been shot from the spindle; now, a weaker or stronger blow of this lathe alters the thickness of the cloth, and after any interruption, the most experienced weaver finds it difficult to commence with a blow of precisely the same force as that with which he left off. In the power-loom, the lathe is easily adjusted to give a steady certain blow, and when once regulated by the engineer, it moves with unvarying precision from the beginning to the end of the piece. Hence power-loom cloth is always of a more equable and regular texture than that woven by hand. Power-looms are generally placed in long apartments, and lighted from the top by a single range of windows to every row of looms. The weavers, or rather the tenters, have very little to do besides watching the machinery, and correcting any defects in the materials to be woven. As the labour is light, it is usually performed by women, or young persons; and we are informed that the business is so simple as to be easily learned in a month or six weeks." In the annexed engraving is pre-

sented a view of the interior of a power-loom apartment. All the looms are of iron, and moved by belts from shafts, the shafts being turned by steam or water-power.

SILK.

Silk is the produce of an insect called the silk-worm, or bombyx, but which is properly a caterpillar, which undergoes several changes during the short period of its life. The animal is produced from eggs laid in summer by a grayish kind of moth. These eggs are about the size of a grain of mustard seed; their colour, when first laid, being yellow, but afterwards becoming of a bluish hue. In temperate climes, and with proper precautions, these eggs may be preserved a long time without hatching or rotting. The three successive states of being of the silk-worm are those of the caterpillar, the chrysalis, or aurelia, and the moth; and in addition to these, it undergoes five other distinct modifications of being. When first hatched, it is a small black worm, about a quarter of an inch in length. On being brought forth, it almost immediately begins searching for its natural food (the leaves of the mulberry tree), which it devours with avidity. In about eight days, the head grows much larger, and the worm is attacked by its first sickness. This lasts for three days, during which time it refuses food, and remains perfectly motionless. It then begins to cast its skin, which it accomplishes after much pain and exertion. So complete is this moulting, that not only the covering of the body, but of the feet, the skull, the jaws, and even the teeth, is cast off. The insect then begins to feed with recruited appetite, and continues for five days, when a second moulting takes place, exactly like the first, and so on through a third and fourth course, the animal progressively increasing in size. After the last moulting it feeds voraciously, and increases rapidly in size during ten days, when it has attained its full growth—being then generally from two and a half to three inches long. At this period, it begins to leave off eating, and soon entirely ceases—becomes restless and uneasy, and looks out for a convenient place to commence its spinning labours. Its colour is now a light green; but as the material for forming the silk gets digested, it becomes glossy, and somewhat transparent. The silky substance is secreted in the form of a fine yellow transparent gum in two vessels, which are wound, as it were, on two spindles in the stomach. When the animal has found a suitable angle, or hollow, for the deposition of its silken ball, or cocoon, it begins to spin thin and irregular threads at first, the silk being drawn through two minute apertures beneath the jaws. In four days the cocoon is completed, the labourer remaining, of course, always on the inside of the sphere it is forming. The cocoon resembles a pigeon's egg in shape and colour, but is not quite so large. As may be imagined, the insect, from the continual emission of the gummy silk, together with the want of food, gradually contracts in size; and if the cocoon be opened after it is finished, the animal will appear in the form of a chrysalis, with a smooth brown skin—its former covering lying beside it. The silkworm goes through all the transformations above mentioned in the space of from twenty two to thirty days, according to the temperature to which it is exposed. The cocoons containing the insects intended to be preserved for laying eggs are left undisturbed, and the chrysalis gradually undergoes a transformation into the state of a moth. This change is accomplished in the space of about twenty days; and the moth, by great labour and ingenuity works its way through the cocoon, but without injuring it, and sets itself at liberty. It then appears as a large moth, of a grayish-white colour, furnished with four wings, two eyes, and two black horns, or antlers, of a feathery appearance. This moth enjoys its existence only a very short time. It remains almost entirely fixed to one spot, the wings never being used for the purpose of flying, but only in assisting it in fluttering while seeking its mate. When this object is attained, the female deposits her eggs, and both end their being in the course of two or three days afterwards. The number of eggs laid by the female varies from 250 to 500; and these eggs, in about six months after, produce larvæ as before. It will scarcely be credited, but is nevertheless true, that in a few short weeks—that is to say, from its being hatched to the period of its full-grown size—the weight of the silkworm is increased more than nine thousandfold. The greater part of the raw silk introduced into England is from China, India, Italy, and some other warm countries.

The cocoons being prepared and assorted, the material is ready for being *reeled*. The great point in reeling is to make the thread of as even a thickness as possible; *perfect equality* is scarcely attainable. An experienced reeler, with the assistance of a girl to turn the wheel, can with ease wind off a pound of silk in a day. Six or eight pounds may be wound off in a day, but a coarse, foul and ordinary silk, will be the produce. The modes of reeling silk in Italy and France are very different, but that of the former is reckoned the best. The floss, or inferior silk, of the cocoons is not reeled, but spun, after being mixed with the silk of the injured or inferior cocoons.

After reeling, the next process for preparing the

raw silk for the weaver is that of *throwing*. It has already been mentioned that this branch of the art was introduced by Sir Thomas Lombe into England, in 1718, from models surreptitiously obtained by him at Piedmont. Considering the remarkable perfection now attained in this country in the science of mechanics, it will not appear strange that these throwing-mills have been long since superseded in Great Britain by subsequent improvements.

Raw silk, preparatory to weaving, must be made to take one of three forms, respectively termed *singles*, *tram*, or *organzine*. *Singles* is merely the raw silk twisted, in order to give more firmness to its texture. All raw silk, for whatever manufacture designed, must undergo this process. *Tram* is formed by twisting together, not very closely, two or more threads of raw silk, and this generally forms the weft, or transverse threads of the web. *Organzine*, which is principally used for warp, is produced by a very elaborate process, of which it would be impossible to convey any correct idea to the general reader without the aid of a diagram. The principle of the process, however, may be generally stated to be like that of making rope, where the combined strands are twisted in an opposite direction to that given to the separate threads, and this is accomplished by giving a reverse motion to the machinery; whereas singles and tram are twisted only in one direction, similarly to twine, or to the individual strands of which the larger rope is made. Silk thread intended for organzine is in the first process twisted in a left hand direction. The organzine, when finished, is transferred to reels instead of bobbins, whence it is made up into skeins, and sorted for sale or use. Previously to this, however, the reels are subjected to a process of steaming for two or three minutes, in order to prevent any after crinkling. The silk thus thrown is called hard silk, and must be boiled for some hours with a quantity of soap, in order to discharge the gum, and thereafter well washed in a current of clear water to discharge the soap, after which the silk appears soft and glossy.

Silk is woven into various fabrics, plain and figured, by the Jacquard loom, and also into velvets. The fine soft pile of velvet is produced during the process of weaving, by inserting short pieces of thread doubled under the shoot or weft, and which stands upright in such a way, and so close together, as entirely to conceal the interlacings of the warp and shoot. In the production of every yard of velvet, six yards of pile at least are used. The loops of the double threads intended for the pile are supported by grooved wires, and the loops are afterwards divided by running a sharp instrument, called a *trevel*, along the groove. This is done by the hand, and, of course, requires great dexterity, as the slightest deviation from the proper line would infallibly injure, if not wholly destroy, the silk. It is considered a good day's work for one man to weave one yard of plain velvet, for which he is paid about five times as much as for weaving plain silks.

WOOLLEN.

The wool of sheep, cleaned and dressed, has from the earliest ages been employed in the fabrication of cloths. Until comparatively recent times, however, the manufacture was conducted in a homely manner, and on a small scale. As in the case of flax, it was customary to spin the wool by means of a wheel and spindle superintended by a female, who made little progress during a whole day's labour. This plan has now been almost entirely laid aside, and wool is generally spun in factories by machinery for the purpose. After being spun, the yarn is woven into cloth, which is fulled or thickened, and then dressed on the surface by teasles, and an apparatus for shaving the pile. The best cloth is dyed in the wool before weaving; but much is dyed after it has assumed the form of cloth.

The woollen manufacture of England is carried on in three different modes—that of the master clothier, who buys his own wool from the importer, and afterwards gives it out to be manufactured either in factories or private houses; the factory system, by which every process of the manufacture is carried on under the same roof; the last is the domestic system, in which private weavers purchase wool from the dealer, and employ themselves, wives, children, and sometimes several journeymen, in the various manufacturing processes under their own roofs. The factory system is evidently the one best adapted for carrying the manufacture to its utmost extent.

The mode of disposing of the various woollen cloths is different in Yorkshire and the west of England, but in both upon a scale in keeping with the magnitude of the manufacture and the commercial importance of the kingdom. In the west of England, the goods are exposed at periodical markets or fairs; in Yorkshire, in cloth-halls, of which there are three at Leeds, besides others at Halifax, Bradford, Huddersfield, Wakefield, &c. These halls consist of long walks or galleries, through the whole length of which the master-manufacturers have their stands in double rows. Between these the merchants pass, and make their purchases. At a certain hour a bell rings, and the market closes, those goods which are purchased being then carried to the merchants' quarters, and those unsold remaining in the stands. The goods are bought in their undressed state, the merchant afterwards getting them finished off himself. Dressing and finishing has of late years become a business entirely distinct from the manufacturing department, and in which to attain perfection has been the chief aim of the Yorkshire merchants. So proficient, indeed, have they become, as to defy any but the most experienced judges to distinguish their cloths from the more costly fabrics of the west of England.

Besides the manufacture of cloth, blankets, and flannels, the department of woollen fabrics comprehends *carpets* and *hosiery*, two very distinct but important branches. Three kinds of carpets are usually made—Venetian, Kidderminster, and Brussels. Venetian carpeting is a plain fabric, composed of thick linen woof on a woollen warp, and is employed chiefly for stair or lobby coverings. The Kidderminster carpeting is by far the most common. It consists of two woollen webs, woven together, and intersecting each other at particular parts, so as to produce definite figures of different colours. The manufacture of this species of carpets has been long carried on with advantage in different parts of Scotland. Brussels carpets possess a basis of strong linen threads, on which the pattern in woollen is thrown up in loops, which are kept firm by small rods. When the web is woven, the rods are pulled out, leaving a soft surface of the closed ends of loops. Latterly, a great improvement has been made in Brussels carpet-weaving, and which has also been adopted for shawls. Instead of using threads of any particular colour throughout, and throwing up the threads as they were required to form the pattern, the custom is now to dye the threads with different colours suitable to the pattern required. Thus, a single thread may be dyed in patches of red, yellow, black, or any other colour, and it performs its part in the pattern through its entire length; the saving of material by this ingenious and piebald mode of dying is immense.

When wool is twisted to a certain degree of hardness, it receives the name of *worsted:* and the manufacture of certain fabrics of this kind is as extensive as that of soft woollen goods. Many of the variegated cloths, called *tartans*, are made of worsted, and so likewise are *tapestries*, and some kinds of *stockings*. The stocking or hosiery manufacture, generally, is conducted by means of stocking-frames and hand-labour; the frame having been in universal use since it drove knitting out of fashion about seventy years ago. The cheap hand-labour

Germany acts as a constant check on the progress of the British hosiery manufacture.

PAPER-MAKING.

The earliest kind of paper, or material on which writing was performed, of which we have any account, was the *papyrus*, used by the ancient Egyptians, and hence our modern word *paper*. The papyrus was a plant, from which thin fibrous membranes were stript, and being pressed together, they formed a rude species of small sheets. The Chinese are said to have understood the art of making paper from the pulp of rags in very early times; but whether the European mode of making paper was derived from that quarter, is not clearly known. The art was introduced amid the obscurities of the middle ages, and most likely through the ingenuity of the Arabians. In the beginning of the fourteenth century, a paper-mill was established at Nuremberg, in Germany; and in 1588, a mill was erected at Dartmouth, in England. Little progress was made, however, in the manufacture of paper in this country, it being supplied, till within the last seventy years, principally from France and Holland.

The principle on which paper is made is very simple. A portion of linen cloth is ground to pulp; this pulp is shaken in a fine wire sieve, so as to settle in a thin cake, or sheet; the sheet is pressed in order to squeeze out the liquid; and, when dry, we have a sheet of paper. Instead of new linen cloth, rags, for the sake of economy, are always employed; and the more substantial the rag, so is the paper the stronger in texture. The quantity of rags produced in Great Britain and Ireland being altogether insufficient to supply the demand for paper, large importations take place from continental Europe, chiefly Germany. Cotton rags, or the refuse cotton of factories, are also employed in the paper manufacture; but only for inferior papers, or as an alloy, which is not always justifiable. The processes of preparing the rags, making by hand, and making by machine, may be respectively noticed.

Preparing the Rags.—After the rags arrive at the mill, they are picked and sorted into four or five qualities. All substances not suited for paper-making, or which might injure the machinery, such as pins, buttons, pieces of silk and woollen cloth, must be carefully removed. This greatly facilitates the work of the cutters, who have also to see that the rags are sorted into their proper parcels. In cutting, small table frames are used, the upper surfaces of which are composed of wire-cloth, containing about nine meshes to the square inch. In the centre of these tables a knife or short scythe is fixed, in a slanting direction. Against this knife the females at the tables draw the rags, cutting them into pieces of about four inches square, when they are put into boxes according to the fineness of their texture. During this operation, much dust is beat out of the rags, which falls through the meshes of the wire-cloth. It is calculated that a woman will cut a hundredweight of rags by this method in a day. After the rags are cut, they are put into a cylinder of wire-cloth, measuring about four feet in diameter and five in length. An axis runs through the centre of the cylinder, which is furnished with spokes about a foot long, attached at right angles to the axis. The machine being set in motion, the spokes beat and toss the rags about, which frees them from any dust that may remain after the cutting. When the rags are very dirty, it has been found advantageous to put them into the duster before being cut, which renders that operation easier and more cleanly for the people engaged at the work.

The next operation is that of boiling the rags in an alkaline ley. Sometimes this is done by simply putting the rags into open vats containing the ley, with a fire underneath. Others, however use close boilers, into which steam is admitted by means of a pipe from the top. The alkaline ley is composed of from four to ten pounds of the carbonate of soda to the hundredweight of rags, according to their quality, and a third part additional of quicklime, to render it caustic. Some manufacturers use lime alone, and others pot and pearl ashes, for the purpose of bleaching; but soda and quicklime are the substances generally employed. The rags are boiled for about eight hours in this solution, and are then allowed to cool gradually, it having been found that when the cooling takes place too rapidly, any dirt upon the rags is apt to be indelibly fixed.

After being boiled, the rags are carried to the first washing-engine, which consists of a large oblong stone trough, into which a stream of water is allowed to flow and to escape by the other end. This cleans the rags most effectually, the run of water carrying away any impurities that may still adhere to them. On one side of this trough is an engine, which again washes and grinds the rags, and is termed by the workmen the *breaking-in machine*. This powerful apparatus consists of an elliptical-shaped trough, made generally of wood lined with lead or copper; within it, a grooved roller revolves horizontally over the surface of a sharply-grooved plate, by which the rags are torn to shreds. The grooves on the roller, and those on the plate, act upon the pieces of rags much in the same manner as cutting with a pair of scissors. The trough is half filled with water, which comes in at one end and escapes through holes at another part. The engineer puts the rags into the engine, spreads them with his hands, and by means of agitators at the bottom of the trough, no piece is allowed to escape the action of the roller. These troughs are about ten feet in length, four and a half in width, and two and a half in depth, being capable of holding from 112 to 120 lbs. of rags. The operation of *grinding*, as it is called, occupies about an hour and a half; and when the rags are sufficiently reduced to a pulp, the stuff is passed down from the trough to the draining boxes, by means of a pipe six inches in diameter. This pipe is furnished with a valve at the bottom of the trough, which the engineer opens by means of an iron hook, and through this the pulpy matter flows freely. On reaching the draining boxes, the water is allowed to run off from the pulp previous to the bleaching process.

In the grinding operation a great improvement has lately been effected. It was found that the constant flow of water through the agitated trough of the engine carried off a considerable proportion of the finer particles of the stuff, and thus caused a serious loss. A plan has been invented to lift the waste water by a revolving sieve, which admits the water alone and excludes the stuff, thereby effecting a most important saving to the manufacturer.

Bleaching is sometimes performed by subjecting the pulp to the action of chlorine, which is manufactured from sulphuric acid, sea salt, and the black oxide of manganese. The chamber in which this is performed must be close, so that the chlorine may not escape. A more common method of bleaching, however, is to steep the pulp in a solution of the chloride of lime, by which the fibres are not so much injured as when chlorine is used. In bleaching, great care should be taken that the solution is not too powerful, or the texture of the paper may be materially injured by the process.

The bleaching-house consists of a long apartment, furnished with stone chests about three feet deep, ranged on each side, and capable of containing about fifty-seven cubic feet. These chests have false bottoms pierced with small holes, which can be opened at pleasure, to allow the solution to escape. When the water is drained off the pulp is carried to the bleaching-chests, and about one hundredweight put into each, along with from six to eight pounds of Tennant's saturated chloride of lime

and about twelve gallons of water. The stuff is allowed to steep for twenty-four hours, being frequently stirred in the interval, so that every part may be equally bleached. After bleaching, the pulp is again put into a washing-machine to free it thoroughly from the bleaching-liquor. This process is similar to that previously described, except that the roller is screwed down closer to the fluted plate, so as to reduce the pulp to a finer consistence. In making what is called machine-paper, the size is now added, the addition or the want of which constitutes the chief difference between the paper for the reception of ink and the other sorts. The kinds of size principally used consist of either white soap, starch, glue, or dissolved rosin, with the addition of a few pounds of alum. The size is strained through a sieve into the beating-engine, and there mixed with the pulp.

From the second washing or beating-machine, the pulp is passed down to a large tun or vat called the *stuff-chest*, which is merely a reservoir to keep the pulp till it is put into the machine which converts it into paper. This vat is furnished with agitators at the bottom to keep the pulp of an equal thickness, which now bears a strong resemblance to curdled milk. Previous to being put into the vat, however, it is now almost universally the practice to strain the pulp through bars of brass. These are planed perfectly smooth at the edges, and placed so closely together, that the fibrous part of the matter must pass through longitudinally. By this means, knots, &c., are kept out, which it formerly cost considerable trouble to scrape from the surface of the paper after it had been manufactured.

Making Paper by Hand.—This is the old method of making paper, which is now completely exploded, except for some kinds of writing and coarse packing papers. The pulp is prepared without size, that being imparted afterwards to the sheets by dipping them in a tub. Properly prepared, the pulp runs into a vat, at one end of which stands the vatman with two frames or moulds beside him, made of brass wires or wire-cloth, fixed upon a wooden frame, of the size of the sheet to be made. The vatman holds in his hand a frame of wood called a *deckle*, which fits exactly all round the edge of the mould, for the purpose of giving a clean edge to the paper. For making what is called wove paper, a wire-cloth is required. For laid or corded papers, however, the mould is made of brass wires lying longitudinally, crossed by wooden bars placed underneath, and interlaced by cross wires somewhat thicker than the longitudinal ones.

The vatman, laying the deckle upon the mould, dips it into the vat, and takes up a quantity of the pulp. If he considers there is too much in the mould, he throws off part of it, and then, holding the mould horizontally, he shakes it to and from him, which connects the fibres together, and renders the fabric of an equal thickness throughout. The water flows through between the wires, and as soon as the pulp has attained a degree of consistence, the vatman lifts off the deckle, and hands the mould to the coucher, who stands at the other corner of the vat. The coucher places the mould in an inclined position for a few seconds, so that as much water may flow from the pulp as possible. He then puts a piece of felt or blanketing upon a wooden board, and turning the mould over upon this, the pulp adheres, and the mould is handed back to the vatman. Another felt is placed upon the top of the pulp laid down, and the process is continued until what is termed a *post* is completed. A strong board is then placed upon this, and the whole is put under severe pressure, in order that the water may be thoroughly extracted. When the paper is taken out of this press, it may be handled, and the sheets are taken from between the felts and placed by themselves. Another pressing is then given, slighter than at first, for if too severe, the sheets are apt to stick so closely together that they cannot be afterwards parted without injury. After this pressing, the sheets are carefully separated from each other, and again pressed, previous to being sent to the drying loft. In making the finest writing-paper, this separation and pressing is performed twice, which considerably improves the texture of the paper.

The next process is drying, which is done in a loft containing a number of spaces filled with hair-ropes fixed into spars of wood, the ends of which slide up and down upright posts at the corners of each space. Five or six sheets of paper are hung together upon these ropes and allowed to dry. The air is freely admitted by the sides of the loft, which are sparred with shutters, to close out the air entirely, in case of bad weather; and each loft is provided with pipes, which go round the room, and can be filled with steam, so that the drying process may go on at all times.

When the paper is quite dry, it is sent to the sizing house, where it is made suitable for receiving ink. The size is made from the parings of skins, &c., which are boiled for about ten hours to reduce them to a gelatine. The gelatine is carefully strained; about a fourth of its weight of alum is then added, and the mixture is allowed to congeal. When used, it is diluted with water, and an additional supply of alum put in. The workman then takes about six quires of paper in his hand, and dips it into the tub containing the size, where it is allowed to remain for a few minutes, so that every sheet may be well soaked. The sheets are carefully lifted out one by one, and put into a press, which is slightly screwed down, that the surplus size may flow out. In order that the sheets may be easily separated, the edges are washed with hot water; and when taken out of the press, each sheet is laid between woollen clothes, in the same manner as when the paper was first taken from the mould. When strongly sized, the sheets are again separated carefully, and kept about forty-eight hours before being hung up to dry.

When sized and dried, the paper is taken to the finishing-house, where it undergoes several pressings to smooth the surface. It is then sorted and put up in reams, consisting of twenty quires of twenty-four sheets each, or 480 sheets.

Making Paper by Machines.—From the vat or stuff chest, the pulp, prepared as already described, is let out by a sluice into a pipe which leads it to one end of the *making-machine*. The opening from this corresponds exactly with the breadth of the machine, and the quantity and thickness of the stuff admitted into the latter is regulated according to the kind of paper to be made.

The machine now in general use for the making of paper is the invention of Mr. Louis Robert, and was brought to this country about forty years ago, by a M. Didot, who, with the assistance of MM. Fourdrinier, and Mr. Dorkin the engineer, greatly improved the invention, and obtained a patent for it.

The first part of the machinery upon which the pulp comes is a brass wire-cloth, of so fine a texture that there are seventy wires in the inch, and which is woven in the same way as linen. This wire-cloth may be described as a sort of belt without any break, which is kept continually revolving, but in such a way that the upper side upon which the stuff is received preserves a flat and horizontal surface. The wire-cloth moves upon a number of small copper rollers, which have an agitating horizontal motion, and this distributes the stuff equally over the cloth, giving a uniform strength and thickness to the paper. After passing between a pair of rollers, where it delivers the stuff, it is led backwards again under the frame; and so goes on in a continuous revolution. Movable sides are attached to the upper surface of the wire, which regulate the breadth of the sheet to be manufactured.

The first pair of rollers through which the stuff passes

are called the couching rollers. The under roller is simply cast-iron, while the upper one is covered with woollen cloth of a peculiar texture, manufactured for the purpose. It is upon this upper one that the stuff is delivered. The pressure from these rollers is slight; and the pulp is next led on to an endless felt, and passes between two cast-iron rollers. The machinery of this felt must be so regulated, that it will go with the same speed as the wire-cloth and couching rollers, otherwise confusion would ensue. In passing through the first pair of rollers, only one side of the stuff is rendered smooth; but in the second pair it is reversed, and the rough side is now pressed. These rollers are closer than the first pair, and the pressure being greater, the sheet is now more dry and firm. It often happens that, in passing from these rollers to those that succeed them, the paper breaks, and adheres to the woollen cloth; in the event of which, should the broken parts be carried round on the surface of the roller, they would inevitably injure the part of the sheet which follows. To prevent this casualty, there is affixed lengthwise, along the upper surface of the roller, a large knife, called the *ductor*, resembling in breadth and sharpness a common scythe, the edge of which, being placed in a sloping manner, like the blades of a wright's plane, is brought so close to the roller, as effectually to shave off any substance that may chance to adhere to it.

The sheet next passes through two other pairs of rollers, which press out the water, and render the paper smooth and firm. It is then carried to the drying cylinders, which are hollow and filled with steam, introduced by pipes placed at both ends of their axes. When these cylinders are too hot, the paper will be observed to shrivel; and by an ingenious contrivance, the extra steam can be let off, so as to reduce the temperature. The water which collects in the cylinder is carried off by means of an instrument shaped like a cork-screw, and which is wrought by the machinery. The paper is again passed through a pair of rollers, to smooth it after being dried, and is then wound upon a reel. As one reel is filled, it is taken off and another put on in its place; and it is evident that the paper can be made of any length the reel is large enough to hold.

The whole machinery upon which the process we have described is performed, is about fourteen feet in length, and moves at the rate of from twenty-five to forty feet per minute. At one end is seen running in a stream of liquid resembling curdled milk, and at the other comes out a finished fabric, the time required for manufacturing thirty feet of which is little more than a minute. Near the extremity of the machine is usually placed an apparatus for receiving the reels of paper in web, and drawing out and cutting the web into sheets according to the regulated size. The sheets are then sorted and packed up in the usual manner.

By the operations now described, all the printing papers and also letter papers of an ordinary kind are now made, and that to an immense extent. "Suppose," says a writer on this subject, in the "Encyclopædia Britannica," "that a machine makes ten yards lineal of a web per minute, or 600 in the hour, this is equal to a mile in three hours, or four miles per day of twelve hours. The paper is generally made about fifty-four inches wide. Reckoning that there are 300 machines in Great Britain, and that they work twelve hours a day on an average (many go both by day and night), the length of web would altogether be equal to 1200 miles, and the area of what was made would be about 3,000,000 yards daily."

GLASS MANUFACTURE.

The origin of glass manufacture is involved in the greatest obscurity, and has given rise to much ingenious speculation, upon which little or no dependence can be placed. Glass beads have been found on the bodies of Egyptian mummies, which are known to have been embalmed three thousand years ago. Pliny says, that the art of glass-making was accidentally discovered by some shipwrecked Phœnician mariners, whose vessel was laden with fossil alkali, a component part of glass. On kindling a fire on the sand to prepare some food, and placing their cooking vessels on pieces of the substance just named, the sand, by the agency of the fire and its union with the alkali, became vitrified, and hence, according to this authority, the discovery of the art of glass-making.

The first glass manufactory of any note was established at the village of Murano, near Venice. The glass produced here was superior to any in Europe, and for a long time the principal supply was obtained at this place. The Venetians were long celebrated for making mirrors, which they brought to considerable perfection. Window-glass appears to have been made in England in the middle of the fifteenth century, but it was of an inferior description. In 1557, the finer sort of window-glass was manufactured at Crutched Friars in London. The first flint-glass was manufactured at Savoy House in the Strand; and the first plate-glass for mirrors, coach-windows, &c., was made at Lambeth in 1673, by Venetian workmen brought over by the Duke of Buckingham. Glass-making was introduced into Scotland by James VI.

The art of staining or colouring glass is believed to be coeval with the discovery of the article itself. It is certain that it was known in Egypt several thousand years since, and tradition gives the honour of the discovery to an Egyptian king. The art of combining colours so as to produce pictures is of more recent date. The early specimens of stained glass exhibit a series of different pieces of various colours, joined together like mosaic work, so as to bring out the representation desired. This can now be done on one entire sheet. For a long period, the pictured glass used in cathedrals, &c., was merely painted on the surface, and was consequently liable to be rubbed off. The colours now are incorporated by fusion, and cannot be obliterated but by the destruction of the glass itself. The discovery of this art is ascribed to a painter in Marseilles, who went to Rome during the pontificate of Julius II. It was afterwards greatly improved by Albert Durer and Lucas of Leyden.

All the pigments used in painting on or staining glass are oxides of metals or minerals, as gold, silver, cobalt, &c., which, after being laid on, are subjected to a strong heat, until they penetrate into the body of the glass, or become fixed on its surface, and thus give out their fullest brilliancy and transparency. Animal and vegetable matters, which are freely used as colouring in ordinary painting, are wholly excluded in this, as the operation of the fire would entirely destroy their colouring properties. The colours that are meant to penetrate into the glass for the purpose of staining it are wholly transparent, while those which are merely fixed upon the surface are only semi-transparent. Any colour or tint can be communicated to the glass in this way, and the art is at present practised with great success. The description of glass best adapted for painting upon or staining, is the finest crown or window-glass.

A glass-house is usually built in the form of a cone, from 60 to 100 feet high, and from 40 to 80 feet in diameter at the base. The furnace is placed in the centre of the building, and is generally of an oblong figure, although sometimes circular. Below the furnace is an arched gallery, extending right across the building, and terminating in folding-doors, large enough to admit a barrow for carrying out the ashes. In the sides of the furnace are apertures called working-holes, through which the materials are put into the pots, and the blowing-tubes inserted. In a crown-glass manufactory, the furnace generally contains from four to six pots; but this will also

gether depend upon the size of the building. The stone used in constructing glass furnaces must be of the finest grain, that called fire-stone, got from Coxgreen, in the neighbourhood of Newcastle, is considered the best for this purpose.

Crown or window-glass is usually composed of kelp and fine white sand, but pearl ashes and other alkalies are sometimes used instead of the former. Kelp is made by burning sea-weed, which is cut from the rocks for this purpose in the months of May, June, and July. After being spread out and allowed to dry for some time, it is gathered together and thrown into a pit, where it is reduced to a state of fusion by fire. When cool, the kelp is a hard solid mass, and must be broken into portable pieces for convenience. In preparing the kelp for glass-manufacture, it is broken by a machine called a *stamper*, afterwards ground in a mill, and then passed through a hair sieve. The best kelp is said to be that made in the Orkneys; and it is also manufactured in large quantities both in the West Highlands and in Ireland.

The best sand for glass-making is that which contains most transparent particles, and this is found in large quantities in that brought from Lynn Regis in Norfolk, and the western coast of the Isle of Wight. The sand is put into a large vat, and boiling or cold water poured upon it until the water runs off clear. It is then subjected to a red heat for twenty-four hours, and immediately on being taken out is plunged into cold water, which divides the particles of sand, and makes it unite more readily with the alkali. Some put nitre amongst the sand during this process, which consumes any sulphur or other extraneous matter which may be present. The sand and kelp are next mixed together, in the proportion of eleven parts of the former to seven or eight of the latter. It is now, however, becoming very common to use the carbonate of soda and lime instead of kelp in the manufacture of crown-glass; and from these alkalies being much purer than kelp, a better article is produced.

When the sand and alkali are properly mixed together, the compost is put into the calcining arch or reverberatory furnace, where it is reduced by heat to a semi-fluid state. This process requires from three to four hours, and the *frit*, as it is now called, is taken out, placed upon an iron plate, and cut into cakes before it becomes quite cold. The calcining furnace is generally about ten feet long, seven feet wide, and two feet high. The sides and top are built of fire-brick, and the rest of common brick; and the bottom must be carefully cemented, to prevent the frit from oozing through the seams. It is the opinion of most glass manufacturers, that the frit should be kept for about six months before it is used. If glass is made from new frit, it is full of what are called seeds, the presence of which depreciates the quality of the ware.

The frit is next put into the melting pot, along with a proportion of what is called cullet, which is nothing more than broken crown-glass. The melting pot is formed of the finest clay, that obtained at Stourbridge, in Worcestershire, being considered the best adapted for this purpose. The clay is freed from all extraneous particles, which, if allowed to remain, would injure the pot, and about a fourth part of old crucibles ground into a fine powder is added. Pots made from this mixture resist heat much better than when altogether formed of the virgin clay. The pots are very gradually dried, being generally kept for nine or twelve months at a temperature of about fifty degrees. They are afterwards tested in a furnace before being used, and last upon an average for from eight to ten weeks.

When the frit and cullet are put into the pots, the furnace is heated to as high a temperature as possible, until the metal is reduced to a liquid state. It is then skimmed of all extraneous substances which may be floating on the surface, and is fit for the operations of the workmen. An iron tube, six or seven feet in length, thicker at one end than the other, is heated and dipped into the liquid metal. A portion of glass adheres to the end of the rod, which, being allowed to cool a little, is again dipped in, and gathers more. The rod is then taken out and hung perpendicularly, that the metal may be equally distributed on all sides, and also that it may be lengthened out beyond the rod. The metal is next rolled upon a smooth iron plate called the *marver*, and afterwards blown out slightly, so as to resemble a pear in shape. The blower then heats the metal twice, blowing it out between the heatings, when it is brought to a globe shape. The glass is then allowed to cool a little, and a rod of iron, called the *punty rod*, is attached to the side immediately opposite to the tube. This is done by dipping the end of the rod in the liquid metal, which adheres readily to the half-cooled glass, and the tube is detached by touching it with a piece of iron dipped in cold water, leaving an aperture in the glass about two inches in diameter. The glass is again put into the furnace until it has become sufficiently ductile to yield readily to any impression. The workman then twirls the globe round slowly at first, but afterwards with great velocity, during which the aperture formerly mentioned gradually widens until it reaches a certain point, when the globe suddenly flies open with a loud ruffling noise, and becomes a plane or circular sheet of glass, about fifty inches in diameter. This is an exceedingly beautiful operation, and requires considerable skill on the part of the workmen. The circular motion is still continued, until the sheet is sufficiently cool to retain its form, when it is carried to the annealing arch to be tempered. The punty rod is detached by means of large shears, and the sheet of glass is lifted on a wide-pronged fork, and set up edgewise in the kiln. A kiln will hold from four to six hundred sheets. When full, the mouth is built up, the fire withdrawn, and the kiln allowed to cool as gradually as possible. The glass is taken out, the circular sheets cut into halves, and assorted into different qualities, known by the names of *firsts*, *seconds*, and *thirds*.

SHEET-GLASS.

The process we have described is altogether applicable to crown or window-glass, but the manufacture of sheet-glass is somewhat different. In making sheet-glass, the same materials are used as in crown-glass, the difference being in the manner of forming the sheet. When the metal is melted, the workman dips his tube into the pot, and when he has gathered a sufficient quantity of the liquid glass upon it, he places it in a horizontal position upon a hollowed block of wood. He turns the rod round in his hand, with the metal resting upon the hollowed block, which forms it into a solid cylindrical mass. Water is poured upon the block during this operation, the action of which upon the glass gives great brilliancy to its surface. If the glass was only red hot, on coming in contact with the water it would crack, but at the great heat at which it must be kept so as to be ductile, no injury takes place. When the metal is sufficiently formed and cooled, the workman blows into the tube until he perceives the diameter to be of the dimensions required, which depends upon the size of the sheet to be made. The metal is again put into the furnace, and when softened, the workman swings it round his head, reheats and continues to swing it, until the cylindrical mass has attained what he thinks a sufficient length. He then fills the tube with air, and closes up the hole, so that none may escape; after which the metal is again put into the furnace, and as it becomes soft, the air bursts from the end opposite to the tube, leaving an aperture. The cylinder is then turned round very quickly, which renders it perfectly straight; and then, by applying cold iron to the end of the glass next the tube, a sudden contraction takes place, which separates the cylinder of glass from the iron tube. The cylinder thus formed is allowed to cool for about five seconds, and it is then split up lengthwise by

drawing a red-hot iron rod along the inner side. The glass has next to be flattened, which is done by softening it in a furnace upon a smooth plate, where, as it begins to melt, it gradually opens, and is smoothed with a piece of charred wood. It is then put into the annealing furnace to be tempered, in the same manner as crown-glass.

Sheet-glass may be made of any thickness, and possesses considerable advantages over crown-glass. It has none of that wavy appearance too often seen in crown-glass, and a larger square can be obtained when the sheet is formed. It is difficult to get a sheet of crown-glass which will yield a square 34 inches by 22, whereas the common size of sheet-glass is 40 inches by 30.

PLATE-GLASS.

The manufacture of plate-glass requires greater care than either of the two preceding kinds, and the process is different—the plate-glass being moulded, and not blown, as is the case with other kinds of glassware. The sand made use of must be the finest that can possibly be obtained, and requires to be well washed, to free it from impurities, and passed through a fine sieve, previous to being mixed with the other ingredients. At St. Gobin, in France, crystallized carbonate of soda is used as the alkali; and at Ravenhead, near St. Helen's, Lancashire, the soda is obtained by treating sea-salt with pearl-ash, the result of which is carbonate of soda and muriate of potash. The latter body is easily got rid of, as it crystallizes at a higher temperature than the carbonate of soda. The soda thus prepared is exceedingly pure, and well adapted for glass manufacture. To these are added dry slaked lime carefully sifted, and cullet, as in crown-glass making. The following proportions are stated by Dr. Ure to have uniformly yielded a beautiful glass:—"Sand, 7 cwt.; quicklime, 1 cwt.; dry carbonate of soda, 2 cwts. 37 lbs.; and about the same quantity of cullet as there is sand."

These materials are generally fritted before being melted; but at St. Gobin, in France, this is sometimes dispensed with. Two kinds of crucibles are required in the manufacture of plate-glass; namely, the pots in which the materials are melted, and the basins from which it is poured upon the moulding plate. These crucibles are made from a clay entirely free from iron and lime, and which is dried, ground, picked, washed in water, and passed through a fine hair sieve. Old crucibles ground to a powder are mixed with the clay in proportions according to its quality. This composition, when prepared, is called *slip*, and is also used for cementing the furnaces.

The materials of which the glass is composed are first put into the pots to be fused, which occupies about sixteen hours, and then transferred to the basins. The transfer of the melted glass from the pots to the basins is called *lading*, and is performed by ladles of wrought iron furnished with long handles. This second melting is called *refining;* and the glass is allowed to remain other sixteen hours, which is necessary for the disengagement of the air-bubbles introduced by the transferring, and for giving the metal the proper consistence for casting. For three hours previous to the casting, all the openings in the furnace are closed—an operation called *stopping the glass*, or *performing the ceremony*. The glass is tried; and if found of the proper consistence, and free from air-bubbles, the basins are carried to the casting table.

This table was formerly made of copper or bronze, but cast-iron is now found to answer the purpose better. It is about ten feet long, five feet broad, and from six to seven inches thick, supported by a wooden frame which rests on iron wheels. Along the sides of the table are two parallel bars of bronze, which support the roller in its progress, and determine the thickness of the glass. The roller is made of bronze, and is run along the table after the glass is poured on, to spread it equally. When the liquid glass is poured upon the table, two men run the roller slowly and steadily from one end to the other and after two plates have been formed, the rollet is allowed to cool. The plate of glass is next inspected, and if any air-bubbles appear, it is cut through, and is then put into the annealing furnace, where it remains for fifteen days.

When tempered and cooled, the rough edge is cut off the glass by means of a diamond, and the plates are sorted according to their sizes; it being necessary, when air-bubbles occur, to cut a larger piece from one than from another. The next step is the grinding of the surface, which is done by cementing the glass upon a horizontal table made either of freestone or wood. One plate is then reversed and suspended over another, and ground flint is introduced between them. The suspended plate is fastened upon a conical stone, with a ball at the top for the workman to hold it by. When machinery is used for this process, the upper plate is fastened to a square of cast-iron, which receives a rotary motion similar to that communicated by the hand. When one side has been sufficiently ground, the plates are reversed, and the same operation performed on the other. By this grinding, the plates have been rendered perfectly level, but they have still to be smoothed before receiving their polish. For this purpose, they must be again ground with emery powder, of increasing degrees of fineness. The glass is then polished on both surfaces by means of a piece of wood covered with layers of woollen cloth. The glass is fixed, as before, upon the stone table, and a quantity of the red oxide of iron (the colcothar of commerce) is laid on, and the surface is well rubbed with the covered wood. Plate-glass is extensively manufactured into mirrors, which is done by applying a layer of tinfoil alloyed with mercury to their posterior surface.

FLINT-GLASS, OR CRYSTAL.

Flint-glass, or crystal, is composed of Lynn sand, which is calcined, sifted, and washed for the purpose; red lead or litharge, and refined pearl-ash. It was formerly made of calcined flint, but the finest Lynn sand has been found to produce a clearer ware, and is therefore preferred. The proportion of these materials varies in almost every manufactory, but the following receipts are stated, on good authority, to produce an excellent article:—

1.	Fine white sand	300 parts.
	Red lead or litharge	200
	Refined pearl-ashes	80
	Nitre	20
	Arsenic and magnesia a small quantity.*	
2.	Siliceous sand	3 parts.
	Minium (litharge)	2
	Carbonate of potash	1½

To these must be added a considerable quantity of cullet, or broken crystal—about a third or a fourth of the weight of the whole being thought necessary.

A flint-glass furnace varies little from those described for other kinds of glass, except that it is round in the top. The pots in which the glass is melted are larger at the top than the bottom; and the top is arched over that no dust may fall in, with a hole at the side for the insertion of the tube. When the glass is sufficiently melted, the tube is inserted, and a quantity lifted out upon its point in the same manner as for crown-glass. After being rolled upon the marver, the glass is blown out to a globe shape, when the punty rod is attached, and by means of an instrument resembling a pair of sugar-tongs, the glass is moulded to the form required. The shapes into which flint-glass is manufactured are so numerous, that it would be almost impossible to describe them all. The operations are extremely simple and beautiful, and are performed with a rapidity which is truly astonishing. The workman is furnished with a pair of compasses and a graduated scale, to measure the article which he is making, by which they are kept to a uniform size. When finished, the articles are all weighed, to see that the right quantity

* Ure's Dictionary of Arts.

of glass has been used in their manufacture, and after this they are put into the annealing furnace.

A very beautiful kind of crystal vessel has been made recently, which is clear in the inside and coloured without. This is done by dipping the tube into a pot of clear glass first, which is blown out and allowed to cool a little. The globe thus formed is then immersed in coloured glass, which readily adheres when it is made into the shape required. Small white figures are also sometimes put on to the sides of vessels. This is done by placing the figure upon the glass while hot, and covering it with a thin layer of liquid crystal, through which the white figure shines. Optical glasses are made from crystal, in which case the utmost care is necessary to keep the metal entirely free from waves, otherwise the glass will be useless.

What is called glass-cutting, or grinding, is a separate trade from blowing in all glass manufactories. The cutting-wheel is driven by means of a belt proceeding from a large drum attached to an engine or other moving power. Above the cutting-wheel is a conical box, from which wet sand drops upon it, while another is placed below to receive the sand as it falls from the wheel. The wheels used are three in number: the first is made of cast-iron, by which the rough glass is ground; the second of Yorkshire stone, by which the vessel is smoothed; and the third of willow-wood, by which the final polish is communicated. For this latter purpose, the wooden wheel is dressed with rotten-stone or pumice-stone; and for imparting the highest degree of polish, putty powder is used. These wheels are of various forms, according to the shape of the vessel to be cut: they may be broad or narrow, flat-edged, two-edged, concave, convex, &c. The cutter holds the glass to the wheel while it is revolving, and the most beautiful and regular figures are engraved in this manner with astonishing rapidity.

BOTTLE-GLASS.

Bottle-glass is composed of the coarsest materials, generally soap-makers' waste and sand. The following receipt is recommended by Dr. Ure as producing a fine dark-green glass:—Dry glauber salts, 11 lbs.; soaper salts, 12 lbs.; half a bushel of waste soap ashes; sand, 56 lbs.; glass skimmings, 22 lbs.; green broken glass, 1 cwt.; basalt, 25 lbs. The furnaces for preparing bottle-glass are similar to those used for crown-glass.

When the metal is melted the pots are skimmed, and the workman introduces his tube. When sufficient is gathered upon the end of the tube, the blower rolls the glass upon a stone, blowing into it at the same time. He then puts the metal into a brass or iron mould of the shape of the bottle to be made, and blows through the tube until it comes to the desired form. This mould is so contrived as to open down the middle by means of a spring which the blower works with his foot. The mould is open when he puts in the metal at first; it is then immediately closed, and opened again when the bottle is formed, which is handed over to the finisher. The finisher detaches the tube from the mouth of the bottle, and fixes the punty-rod to the bottom. He then warms the bottle at the furnace, and takes out a small quantity of metal, which is turned round the upper part of the neck, and forms the rim usually seen on bottles. The finisher next employs a pair of shears to give the right shape to the neck: on one of the blades of the shears is a piece of brass resembling a cork, by which the inside of the neck is formed. The bottles thus finished are sent to the annealing arch, which is kept a little below melting heat until full, when the fire is allowed to die out.

The instrument universally employed in cutting window-glass is the diamond, which is set into a metal socket attached to a wooden handle for this purpose. The cutting point of the diamond must be a natural one; artificial points, as well as those produced by breaking the diamond, only scratch the glass, without producing the deep cut which is necessary. The best diamonds for cutting glass are called *mother sparks*, which are sometimes cut down into a number of small sparks, with a natural point to each. It is thought better that a cutting diamond should be made of a large spark, for when one point is worn out, it can be turned and reset, when another fresh point is obtained. The diamonds used are known by the technical name of *bort*—that is, all such pieces as are too small to be cut, or have a bad colour, and are consequently unfit for ornamental purposes.

MANUFACTURE OF EARTHENWARE, OR POTTERY.

Pottery may be generally defined as the art of making vessels from clay, or from other mineral substances ground and rendered plastic like that body. The manufacture of porcelain or china is not included in this definition, inasmuch as it is semi-vitrified, and becomes translucent in the kiln. Stoneware with a painted gluze seems to have been first attempted by the Arabs in Spain, about the ninth century. Soon after, it found its way into the island of Majorca, where considerable progress was made in the art. From Majorca, it was introduced into Portugal, Italy, and France, and from the last into Holland. In the seventeenth century, a pottery was established at Burslem, in Staffordshire, at which, however, only the coarsest articles were manufactured. In 1690, two Dutchmen of the name of Elers introduced the method of glazing ware by the vapour of salt, which they cast in by handfuls amongst heated articles in the kiln. The late Josiah Wedgewood, however, was the first who made any great improvement in this branch of manufacture. It was he who erected the first large factories in Staffordshire, and who, from his extensive chemical and mechanical knowledge, has made the stoneware manufactures of this country superior to those of every other.

The best clay for stoneware manufacture is obtained in Dorsetshire, and another of a quality somewhat inferior is got in Devonshire. These clays are both well suited for the potter, being easily worked, standing the fire well, and becoming very white when burnt. According to an analysis of Mr. Wedgewood, the porcelain clay of Cornwall contains sixty parts of alumina, or earthy matter, and twenty of silica. When dug from the pit, the clay should be cleaned as much as possible with the hand, and freed from stones. At the factory it is cut to pieces and put into a cast-iron cylinder, about four feet high and twenty inches in diameter. An upright shaft or axis revolves in this cylinder, from which knives radiate in all directions, being so placed that the shaft with the knives attached somewhat resembles a screw. In the sides of the cylinder knives are also fixed, which reach nearly to the shaft and remain inactive. When the shaft moves round, the active blades cross the passive, and operate like shears in cutting the clay, which is by this process reduced to a fine pulp. When well ground in this manner, the clay is of the consistence of cream, and is run off through sieves of wire, lawn, and silk, so that none of the grosser parts may enter into the composition of the ware. This liquid clay is then diluted to a standard density, and set aside in cisterns to be used as required.

Vessels made from clay alone, however, are found to crack upon being put into the kiln; and to prevent this, it is necessary to add some siliceous substance, incapable of contraction, to the clay. Ground flint is most commonly used for this purpose. It is prepared by cleaning the flint found imbedded in chalk, subjecting it to a red heat, and throwing it in this state into water, by which it becomes comparatively soft. It is then broken by being placed under an upright shaft, which moves up and down in a frame, and is called a *stamper*. The broken

flint is next transferred to the flint-mill, which consists of a strong wooden tub, built round a circular bottom composed of flat pieces of horne-stone. On the top of these, similar flat stones are laid, which are attached to and driven by strong wooden arms projecting from an upright shaft in the centre of the box. Into this tub the flint is put, and a stream of water is constantly running in which greatly facilitates the grinding. When the flint is reduced to about the consistence of cream, it is passed through sieves in a similar manner to the clay.

The flint and clay liquids are then mixed together in such proportions that the flint powder will be to the dry clay as one to five or six, according to the plasticity of the clay. Sometimes a little Cornish stone is also added; and the following are the proportions generally adopted in one of the principal Staffordshire factories:—

For cream colour—

Silex, or ground flint - - -	20 parts.
Clay - - - - - -	100
Cornish stone - - - - - -	2

The mixture is put into oblong stone troughs called *slip kilns*, bottomed with fire-tiles, and placed above a furnace flue. Heat is then applied and the water gradually evaporated, the liquid being constantly stirred during the operation. By this process the mixture is formed into a fine uniform doughy mass, which is cut into pieces and heaped together in a damp cellar, where they lie for the space of about six months. The clay here becomes black, exhales a fetid odour, and is supposed to undergo a slight degree of fermentation. The longer the clay is kept the finer it is in the grain; and vessels made from it when old are not so apt to crack as the ware formed from newer paste.

Another operation, called *sloping*, or *wedging*, greatly assists in forming a fine quality of clay. This consists in seizing a mass of clay in the hands, tearing or cutting it into two pieces, and striking them together again with a force sufficient to make them adhere. This is repeated about twenty or thirty times, by which the parts of the clay are completely intermingled. In large establishments, this operation is performed by means of a tub, with an upright revolving shaft, on which blades are fixed, the machine being similar to that used when the clay comes first from the pit. The clay is forced by the downward pressure of the blades through a pipe, and is cut into equal lengths, and again returned to the cylinder until the parts are blended together. It is sometimes the practice to beat the clay with wooden mallets; this practice is common in France, and the stuff is afterwards trodden by the feet on a clean floor. In China and Sweden, oxen are made to tread upon the clay, to form it into a proper dough.

A process called *slapping* is performed by cutting a large mass of clay with a wire, and striking the two pieces together with considerable force. This is generally done as the clay is to be used, either in the same apartment in which the manufacturing process is performed, or in an adjoining one.

The clay being thus completely kneaded, is put upon the potter's lathe, where it is formed into articles of various shapes. This lath consists of an upright iron shaft, the lower point of which turns in a socket, and the upper is fixed in a broad wooden disc. Near the top the shaft passes through a socket attached to the framework of the lathe. In the centre is a pulley with grooves of different circumference, by which the speed of the shaft can be increased or lessened as circumstances require. This shaft is driven by a fly-wheel, from which an endless belt passes to the pulley.

The clay is weighed out and handed to the workman at the lathe, called the *thrower*, who dashes the mass upon the revolving wooden disc. He then dips his hands frequently into a dish of water placed beside the lathe, and pressing the clay with both hands, it gradually assumes an irregular conical form. By pressing one hand upon the top of this cone, it is again flattened down to a cake, by which operation all air-bubbles are extricated. He next lessens the speed of the shaft by shifting the belt from a small to a larger groove in the pulley, and forms the clay into the shape of the vessel required. This operation is called *throwing*; and when performed, the vessel is cut off from the disc by a wire attached at each end to a piece of wood. The vessel is then allowed to dry gradually, until it arrives at a certain point called the green state, after which it is put upon the turning-lathe. Here it is turned to its proper shape by a sharp tool which also smoothes it, and after this it is burnished with a steel surface.

In the green state, also, are attached handles and other appendages to vessels, this being the point at which the clay possesses its greatest tenacity, till it is burned. Handles of teapots, &c., are formed by squeezing the dough through different shaped orifices, which, as it issues, is cut into proper lengths and bent into the desired forms. These, being formed, are attached to the vessels by a paste called *slip*, and the seams are smoothed off with a wet sponge. The ware is next placed in an apartment heated to about 90° Fahrenheit, and fitted all round with shelving. When completely dry, they are rubbed over with hemp, and are then ready for the kiln.

The articles made in the manner above described are all of a round form; but there are many which are of a different shape, and require a different process in the manufacture. Oval-shaped vessels are formed by what is called press-work, which is done in moulds made of plaster of Paris. One-half of the pattern is made in the one side of the mould, and the other half in the other side. The parts are formed to fit each other exactly, and are joined in the same manner as the handles are to vessels. Imitations of flowers and foliage are executed in moulds of plaster of Paris. The clay is poured into the mould in a thin state, and is left in the mould for a certain time. The plaster soon absorbs the water, which renders the clay tough; and its thickness depends upon the time it is allowed to stand in the mould. These *furnishings*, as they are called, are then dried to the green state, and fastened on with slip.

When the ware is ready for the kiln, the articles are placed in baked fire-clay vessels called *saga*, or *saggers*. These vessels are made by the workmen during the intervals of their work, and are from six to eight inches deep, and from twelve to eighteen in diameter. The sags are packed full of the dry ware, and are then piled above each other in the kiln, the bottom of one sag forming the lid of another. These dishes are necessary to prevent the ware from being suddenly and unequally heated, and also to protect them from the smoke of the kiln.

The body of a pottery kiln is generally formed of a conical shape, and inside of this is the fire-kiln, which is circular and round at the top. When the kiln is filled with the sag, the door-way [illegible] and fire applied to the furnaces. The heat is [illegible] gradually, from the time the fire is put on till the ware is found to be properly burnt. To ascertain this, the workman draws from the kiln what is called a watch, and if this is found to resemble in colour a previously burned vessel, he allows the kiln to burn a little longer, and then opens the doors of the furnaces carefully, so as to lower the heat by slow degrees. The burning, or *baking*, as it is called, usually lasts from forty to forty-two hours, after which the kiln is allowed to cool very slowly. When the ware is taken out of the sags, a child makes the pieces ring with the handle of a brush used for dusting them, and then immerses them in the glazing material. The glaze is kept in a large tube, into which the articles are put by the child, and lifted out by a man who shakes them in the

air, and places them on a board to be conveyed to the glazing kiln.

"Three kinds of glazes are used in Staffordshire—one for the common pipe-clay or cream-coloured ware, another for the finer pipe-clay ware, to receive impressions, called *printing body*: a third for the ware which is to be ornamented by painting with the pencil. The glaze of the first, or common ware, is composed of 53 parts of white lead, 16 of Cornish stone, 36 of ground flints, and 4 of flint-glass: of the second, 26 parts of white felspar, fritted with 6 parts of soda, 2 of nitre, and one of borax; to 20 pounds of this frit, 26 parts of felspar, 20 of white lead, 6 of ground flints, 4 of chalk, 1 of the oxide of tin, and a small quantity of the oxide of cobalt, to take off the brown cast and give a faint azure tint, are added. As to the stoneware which is to be painted, it is covered with a glaze composed of 13 parts of the printing colour frit, to which are added 50 parts of red lead, 40 of white lead, and 12 of flint; the whole having been ground together."*

The above compositions make a very clear, hard glaze, which is not affected by vegetable acids, and preserves its lustre for an indefinite time. When covered with the glaze, the vessels are put into sags, which have been previously glazed, with a composition of 13 parts common salt, and 30 parts potash. They are then put into the glazing kiln, which is usually smaller than the biscuit kiln, the sags being piled in the same manner as at the first burning. The heat of the glazing kiln is very low at first, but gradually increases until it reaches the melting-point, when great care is necessary to prevent the temperature from suddenly falling. To ascertain when the temperature is high enough, balls of red clay coated with fusible lead enamel are employed. When these balls become of a slightly dark-red colour, the temperature is sufficient to glaze ordinary pipe-clay ware. The fire is kept on for about fourteen hours, after which very little fuel is added, and the kiln is gradually allowed to cool. The vessels are again tried by being slightly struck by a small wooden hammer, when, if they ring freely, they are sound.

There are two ways of colouring pottery ware—either before glazing or after. The printing under the glaze is generally performed by means of the oxide of cobalt, which is purified either by calcining or boiling it in nitric acid. The cobalt is mixed with a certain quantity of ground flints and sulphate of baryta, by which the shade wanted is produced. To fix this compound upon the vessels, it is mixed with a flux composed of ground flints and broken flint-glass. The colouring is ground upon a porphyry slab, with a varnish prepared from a pint of linseed oil boiled very thick, 4 ounces of rosin, half a pound of tar, and half a pint of the oil of amber. This varnish is very tenacious, and requires to be liquefied by heat before being used.

The figure to be fixed upon the vessel is engraved in the usual manner upon a copper plate, which is rubbed over with a colouring matter prepared as above, and the impression is taken upon paper of a yellow colour, made very thin, and unsized. The printed paper is placed upon the vessel, and is rubbed with a roll of flannel about an inch and a half in diameter. After this the vessel is set aside for a little, to allow the figure to become fixed, when it is dipped in water, and the paper washed off with a sponge. The impression being transferred, the vessel is dipped into a strong alkali to destroy the oil, and is then immersed in the glazing matter.

Colouring above the glaze is performed by covering the copper plate with the colouring matter as before, and brushing off what is superfluous. A cake of glue, stiff enough to be handled, is then laid upon the plate, which receives the impression of the figure. The glue cake must be very cautiously lifted off from the plate, and transferred to the surface of the glazed ware which it is intended to print. The same cake will answer for transferring several impressions, by simply washing its surface.

The ornaments on common stoneware vessels are made in relief in France, and hollow in England, by means of a mould in relief which is made to pass over the article. These hollows are filled with a clay paste of the colour required, while the vessel is turning upon a lathe. Net-work and variegated decorations are made in this way by passing different layers of coloured clay over each other.

Metallic lustres, from gold, platina, copper, iron, &c., are produced by dissolving any of these metals in aqua regia, and applying it to the vessels. Over the metallic solution a glaze composed of 60 parts of litharge, 30 of felspar, and 15 of flint, is put, in the vessels burned as before.

Stoneware of the Wedgewood colour is a semi-vitrified ware, which is not susceptible of a superficial glaze. It is composed either of barytic earths, which act as a flux upon the clay, and form an enamel, or by the clay being rubbed over with a compound-vitrifying paste. Semi-vitrified ware undergoes an operation called *smearing*, by which the vessels do not require to be immersed in glaze. They are merely put into the glazed sags, which communicate by reverberation a lustre nearly equal in brilliancy to glaze itself.

PORCELAIN, OR CHINA.

Porcelain is a fine-grained, compact, very hard, faintly translucid ware, of which there are two kinds, one called hard, and the other tender. Hard porcelain is composed of a clay containing silica, which is infusible, and preserves its whiteness in a strong heat, and of a flux consisting of silica and lime. The glaze of this ware is earthy, and admits of no metallic substance or alkali. Tender porcelain consists of a vitreous frit, which is rendered opaque by the mixture of a calcareous clay. It is glazed with artificial glass, into the composition of which silica, alkalies, and lead enter.

Kaolin clay is the largest ingredient in porcelain ware. It is composed of alumina and silica, and is obtained in large quantities in China, Germany, France, and in the county of Cornwall, in England. Kaolin is very friable in the hand, and is with difficulty formed into a paste or dough which will bear to be worked. That found in Cornwall is whiter than the foreign clays, and more unctious to the touch. In France, the clay is washed at the pit, which is repeated after it arrives at the manufactory, and it is also passed through fine sieves. When in this state, felspar rock is added, by the addition of which it is rendered fusible. The felspar is calcined, broken with stampers, and afterwards ground in a horne-stone mill, to render it as fine as possible. This mixture is poured into shallow plaster pans, which absorb the water, leaving a thick paste, which is placed in damp cellars for some months to ripen. The paste is again put into the plaster pans, and cut into small pieces, which are thoroughly dried and ground to a fine powder. It is then moistened and troddon by workmen, who walk over it in every direction.

The clay is now ready for working, which is done either upon the lathe or by casting in moulds. The materials for making porcelain ware are much less plastic than those of other pottery ware, and consequently greater care must be bestowed on its manufacture. When vessels are made upon the lathe, the operations are exactly the same as for stoneware, but they must be performed with greater caution. It is stated by Dr. Ure, that a good workman at Sevres, in France, makes no more than from 15 to 20 porcelain plates in a day; whereas an English workman, with two boys, makes from 1000 to 1200 plates of stoneware in the same time.

When formed, the vessels are allowed to dry very

* Ure's Dictionary of Arts.

slowly, and are then put into the kiln, which is nearly the same as that used for burning stoneware. In this kiln they receive a certain degree of heat, by which the vessels are rendered capable of being handled, and the clay loses its property of forming a paste with water. The vessels are then dipped in the glaze, which consists of felspar rock ground to a fine powder, and formed into a paste with water mingled with a little vinegar. When taken out of the glaze, the vessels are inspected, and the glazing matter applied with a hair-brush to any parts which may remain uncovered. A quality peculiar to porcelain is, that it softens in the fire, for which reason one piece cannot be piled above another in the sags, as is done with stoneware. Every porcelain vessel requires a sag for itself, with a piece of level stoneware in the bottom, covered with sand. This prevents the vessels from warping. The sags are piled above each other in the kiln, and wood put into the furnaces. The heat is gradually increased for fifteen hours, at the end of which time the inside of the kiln has a cherry-red colour. The temperature is then greatly increased by putting small chips of aspen wood into the furnace, which is continued for from thirteen to fifteen hours. The whole firing occupies from thirty to thirty-six hours, when the porcelain is baked. The kiln is allowed to cool gradually for three or four days; and when taken out the bottom of the vessels are covered with the sand put into the sag, which is removed by friction.

Porcelain vessels are very brittle, and are easily damaged, which accounts in some degree for the high price at which they are sold. It is calculated that after being manufactured, one-third of the articles are damaged, most of which takes place in the kiln.

MANUFACTURE OF LEATHER.

Leather making is the art by which the skins of animals are rendered impervious to the action of those external agents which would otherwise decompose them. This effect is brought about by steeping the skins in a certain astringent principle called *tannin*, and may be performed either with the hair on, or, as is generally the case, when it is taken off the skins. Tannin is obtained from the bark of a number of trees, particularly the East India catechu, the common oak, the Spanish chestnut, the Leicester willow, &c. It is found in the largest quantities in catechu—one pound of this, according to Mr. Purkis, being equal to seven or eight pounds of oak bark. Tannin is also obtained, by a peculiar preparation, from the gall nuts of the Levant oak.

When the bark of trees is to be used for tanning, it should be stripped from the trunk and branches in the spring, when the sap flows most freely. The trees should not be less than thirty years old, for it has been found that the bark possesses more tannin when old than when in a young state. The bark, when dried, is ground in a mill, to reduce it to a rough powder, after which it is ready to be used.

The first process which the skins undergo is steeping in lime-water, which is continued for a longer or shorter time, according as the skins are dry or fresh. Sometimes the skins are salted when they are imported from abroad; and in this case they require to be steeped, beaten, and rubbed, until they are brought to a fresh state. The horns are then cut off, and the skins put in heaps for a day or two, after which they are hung up in a shed. During this process, a slight putrefaction takes place, by which the hair on one side, and the fleshy matter on the other, are easily removed. This is done by a blunt knife, or scraper, the skins being stretched upon a wooden beam called a *horse*. The skins are then immersed for about forty-eight hours in water mixed with a little sulphuric acid, which has the effect of distending the fibres, causing the skins to swell. This process is called *raising*, and by it the tannin principle more easily reaches the inner fibres. When sufficiently raised, the skins are put into a pit with a layer of bark in the bottom. On this skins are laid, and then bark and skins alternately. The pit is filled up with a strong decoction of bark, and the whole is allowed to lie undisturbed for about six weeks. At the end of this time, it will be found that the tannin has become entirely exhausted, when the skins must be taken out, and put again into the pit, along with fresh bark. In this they are allowed to lie for three months; and this process is repeated two or three times, according to the quality of the leather required. From six to eight months in all are sufficient to complete the tanning of the commonest kind of sole leather, called *crop* by the trade; but for the better kinds of sole leather, from a year to a year and a half will be required. *Bend leather* is the strongest of all sole leather, and in manufacturing it, the tanning process is continued for a longer period than is necessary for crop. The best and thickest skins, also, are selected for this kind.

When properly tanned, crop leather is hung up in an airy house to dry, which is performed slowly, and the article is then fit for the market. Bend leather, after being dried, is beaten into a firm consistence, so that when cut, the edges present a glossy appearance. The instrument with which bend leather is beaten is a broad brass hammer; and this kind of leather may be easily distinguished from its being darker in the colour, in consequence of lying longer in the tannin.

A coarse kind of upper leather is also made from cowhides, the weakest and thinnest being selected for this purpose. When taken out of the lime-water, and the hair scraped off, these hides are immersed in a solution of the ordure of pigeons, which has the effect of neutralizing the lime. They are then stretched upon a board, and from the inner or fleshy side slices are taken with a sharp knife, until the operator thinks it is reduced to a proper thickness, an operation which is technically called "shaving in the bait." The skins are then put into the tan-pits, where they remain for about six months, after which they are sent to the currier. The skins of seals, calves, &c., are manufactured into upper leather in the same way, except that an equal extent of shaving is not required.

Several improvements have been made in the manufacture of leather, by which the tannin principle is more readily admitted to the inner fibres of the skins. One of the improved methods is that of Messrs. Herapath and Cox of Bristol, and consists in using a machine of two rollers, which is placed in the middle between two tan-pits. The hides, having been previously divested of the hair, &c., are fastened together, and put into the tan-pit in regular folds. After lying in this for a certain time, the end of the belt of hides is laid upon the under roller, which, being set in motion, carries the belt over to the other tan-pit. This is done without pressure; but when the hides have become soft, the upper roller is pressed down against the under one. The hides are again passed through between the rollers, which press out the exhausted tannin, and prepare them for being submitted to a fresh infusion. By the old method, the hides were taken from one pit to another without receiving any pressure, and consequently a quantity of exhausted tannin must have remained in them when put into the fresh liquor. By using this machine, however, this is altogether obviated; and leather may now be tanned in four months, a process which formerly took from eight to twelve. The material is also said to be of a firmer texture, and remains longer waterproof than that produced by the old system.

The most recent improvements are those of Mr. John Cox of Gorgie Mills, near Edinburgh, and for which he has obtained patents. He announces six improved p o

cesses of tanning, any of which may be adopted. His great object is to force the liquid tannin into the vesicles of the skin, and this he proposes to do as follows, in his *fourth* process, which he considers the most suitable in ordinary circumstances. The skin is to be sewed into the form of a bag, and immersed in tanning liquor, while the interior is also filled and compressed from a supply of liquor through a pipe from a cistern placed a few feet above the pit:—"The hide or skin bag being tied tightly at the neck-end to the feeding tube (which tube should be long enough to dip a little down amongst the liquor in the pit in which the bag is to be immersed), tanning liquor is to be supplied to the feeding cistern, when the bag will swell until it can contain no more liquor, when percolation will commence, and be continued with a vigour proportionally to the height of the liquor in the feeding cistern above the liquor in the pit of immersion. As the bag fills with liquor, the pit (having been previously full) will overflow, unless the liquor is supplied from the pit of immersion; and therefore a run-way must be made for the liquor to flow to a reservoir, from which it may be pumped or lifted again to the feeding cistern; and as the percolation goes on, the liquor will flow to the reservoir, again to be raised and circulated as before. The hides or skins tanned according to this process may also be confined in compartments, or jammed against each other for the sake of saving room and quantity of liquor necessary at a time, as described as being practicable in the atmosphere; but I prefer that each bag should have ample room for swelling out as far as its dimensions will permit, as the tanning goes on rather more rapidly and equally in all the parts; while the tension generated by the hydrostatic pressure is more equal, rendering the leather more equal in texture and quality. In this process of tanning there is a double hydrostatic pressure exerted—a greater, which is exerted inside of the bag, and a lesser, which is exerted outside of the bag; and it is the surplus pressure (which is equal to all parts of the bag) of the one above the other that causes the percolation of liquor from within outwards. In all these four processes now described, I prefer that the grain side of the hide or skin be outwards, though I do not confine myself thereto; and I also prefer that some bark or other solid tanning ingredient be introduced into the bags, so as to help to keep up the strength of liquor, and to stop up any holes or apertures that may be in the hide or skin." For further particulars, we refer to Mr. Cox's Specification of Patents. We understand that, by any of his processes, a hide may be as effectually tanned in a week as it was by the old tan-pit method in twelve months, while there is at the same time a saving of tanning material and gelatine.

Skins intended for the manufacture of gloves require in the first place to be washed with pure water. This is done in a cistern placed, if possible, near a running stream; and immediately after being washed, the skins must be worked, or they are liable to become marked with indelible spots. They are next rubbed upon a convex beam, and the rough parts removed with the fleshing-knife. The fleshy sides of the skins are then covered with a cream of lime, and piled together with the wool sides of each pair outermost. They are left in this state for from four to six days, or until the wool is found to come easily off. The skins are then washed in a running water, to free them from the lime, and the wool is taken off by means of small spring tweezers. After this they are fleeced smooth by a rolling-pin, or by rubbing with a whetstone.

The next operation to be performed is steeping the skins in a strong solution of lime, for the purpose of swelling and softening them. They are then put into weak lime-water, and drained upon inclined tables; which is repeated several times, the process occupying about three weeks. The outsides are then rubbed with a whetstone, to remove any wool which may still remain; and the skins are then fit for what is called *branning*. Into twenty gallons of water forty pounds of bran are put, and the skins are steeped in this mixture until they sink, which they will generally do in about two days in summer and eight in winter. During the branning process, the skins must be frequently stirred, that each may get a due share of the liquid. They are next steeped in a solution of alum and sea-salt, which is called the *white stuff*. From twelve to eighteen pounds of alum, and about three pounds of salt, are put into a copper with twelve gallons of water. This mixture is dissolved by heating the copper; and when about to boil, three gallons of the solution are poured into a basin, in which twenty-six skins are worked one after another. The twelve gallons are thought sufficient for one hundred skins; and when all have been worked, they are allowed to steep for about ten minutes. The skins are then taken out, and fifteen pounds of wheat flour are added to the solution. This is next run out of the copper vessel, and the yokes of fifty eggs put into it, in which the skins are worked and afterwards allowed to steep for a day. They are then taken out, stretched upon poles, and allowed to dry.

By this operation the leather is rendered very white and soft, which enables it to bear the working of the softening-iron. This consists of a plate of iron about a foot broad, mounted upon an upright beam thirty inches high, which is fixed to the end of a plank three and a half feet long. This plank is heavily loaded; and the skins having been previously wetted, they are rubbed with the iron upon a board. The skins are sometimes stretched upon the horse, and well rubbed with a blunt two-edged knife, and afterwards polished with pumice-stone. They are then worked upon the stretching-iron, and afterwards smoothed with a hot iron.

Sheep-skins are frequently dressed for household purposes, and on this account are technically called housings. For this purpose, those skins are selected which have the longest and most beautiful fleece. They are first well washed and steeped in water, to render them soft, and then thinned with the fleshing-knife, after which they are put into the bran-pit for four days. The same process as for glove leather, of steeping in alum water and rubbing with paste, is then performed. The skins are next worked upon the horse, stretched upon the stretching-iron, and then dried in the sun with the fleecy side outermost.

Chamois leather is prepared by washing, steeping in lime-water, taking off the fleece, and then branning the skins as before described. The outer skin, or epidermis, is next cut off upon the horse, which removes all excrescences, and renders the skins equal in thickness. They are then branned for a short time, the liquid wrung out of them, and then well beat in a fulling-mill. The next process is to oil the skins, which is done by sprinkling and rubbing over them any cheap animal oil. The skins are afterwards oiled and beat several times, and are then subjected to a fermenting process; after which they are washed in potash ley, and then dried.

Morocco leather is manufactured from goat-skin, but a spurious article is frequently sold under this name, which is made from sheep-skin. The process is much the same as for glove leather, except that the washing is performed offener, and the skins are salted previous to being dyed. Morocco leather is dyed with cochineal, about an ounce being required for each skin. The cochineal is boiled for a few minutes in water along with a little alum, and is then filtered into a cask. Each skin is sewed together edgewise, the grain side outermost, and agitated in the dye liquor for half an hour; after which it is beat and again put into the cask. The skin is next tanned in a decoction of sumach. The tanning is performed twice the process requiring about twenty-four hours. The skins

are then rubbed hard with a copper blade, and hung up to dry. The cochineal gives a scarlet colour to morocco leather; but other colours may be given to it, such as black, by using the red acetate of iron; blue, by indigo; yellow, from the roots of the barberry.

Currying is the process by which the newly-tanned rough leather is converted into the soft, flexible, and jet-coloured article from which the upper leathers of shoes are made. The currier first steeps the leather, and then places upon it a piece of basket work, upon which he treads, in order to soften it. He then shaves the leather by means of a double-edged knife with a horizontal handle at each end. The edges of this knife are curved, and in cutting, it is held nearly at right angles to the leather, which is thrown over an upright beam. The currier stands behind this beam and scrapes downwards. By this means all inequalities are removed, the leather being rendered uniform in thickness and firm in the texture. What is called a stretching-iron is also used, which still further firms the grain; and cleaning knives to make the surface smooth.

The leather is then pommelled by an instrument grooved on the under side and with a cross strap on the top, under which the hand of the workman goes. The leather is folded with its grain side in contact, and rubbed strongly with the pommel, which gives it a granular appearance and greater flexibility. It is then conveyed to the drying-house, where grease is applied to soften it. The grease employed is a mixture of tallow and cod-oil, called *dubbing*, and is applied to the leather by means of hard brushes upon a large broad table. When well greased, the leather is hung up to dry, in order that it may thoroughly imbibe the oily matter. It is then well scraped, to free it from all superfluous oil, which would otherwise injure its appearance and prevent it from receiving the colour readily. The leather is then rubbed on the flesh side with a brush dipped in a composition of oil and lamp-black, until it is thoroughly black. It is then black-sized with a brush or sponge, rubbed again with the oily matter, and afterwards scraped with glass. When coloured upon the grain side, a solution of sulphate of iron or copperas is employed. The leather is then wetted with stale urine, and afterwards rubbed with an iron, to render the grain as fine as possible.

Cow-hides, when dressed for upper leather, are called *neat's* leather, and the shoes made from it are coarse. Common shoes are in general made from calf-skin, which is prepared in the same manner. The uppers of boots are all made from calf-skin, the best part for this purpose being the back and flank. This also applies to cow-skin leather. A considerable quantity of shoes are made from a description of leather called *kip*, which is prepared from the hides of young cattle. It is neither so fine nor so soft as that made from calf-skin, but is superior to the leather of full-grown cow-hides. Horses' hides were formerly much used for making leather, but they are now almost entirely superseded by cow-hides, which are greatly preferred. They were prepared much in the same manner, and when dressed, were generally known by the name of *cordovan hides*. Besides what is supplied by the home markets, this country annually imports large quantities of hides from abroad.

MUSIC—ART OF SINGING.*

It is the object of the following pages to exhibit such a view of the principles and practice of music as may be calculated for popular information and use. The path to musical knowledge has for the most part been rendered rugged and toilsome by the interposition of many needless difficulties. Things really plain and simple have been invested with an air of mystery; and the great principles and leading rules of the art, though in themselves easily explained and easily understood, have been buried beneath a mass of useless technicalities. The conviction that this is the case has sometimes led to the opposite extreme; and the study of music has been apparently simplified by short-hand methods and mechanical contrivances, devised to diminish the labour of reflection and memory. But there is no "royal road" to music any more than to mathematics. Skill in its practice is to be gained only by a clear understanding of its principles. All that the instructor can do is to divest those principles of unnecessary obscurity, and to present the rules of practice in their simplest and most comprehensive form. The rest must be done by the intelligence, attention, and perseverance of the student.

The musical artist, whether as a composer, a singer, or an instrumental performer, requires a very different degree of knowledge and skill from the amateur, who cultivates the art as an elegant accomplishment and as a refined and intellectual pastime—an innocent and salutary relaxation from the severer cares and occupations of life. In this point of view, there is no station or degree of society in which music may not be cultivated with advantage. And the experience of the present day has shown, and is showing more and more, that even the classes who earn their daily bread by the sweat of their brow may find in music a recreation within their reach, full of innocent enjoyment, and pregnant with moral and social benefits. It has been found that the highest pleasures which it can impart—pleasures derived from the knowledge of its noblest productions—are accessible to the humblest as well as the highest, and that it is to the toil-worn artificer, mechanic, and labourer, that music dispenses its best and dearest blessings.

Those, however, whatever may be their station in society, who are to derive such benefits from music, must acquire a knowledge of it *as an art*, whose principles and rules afford exercise to the intellect, and whose lofty and beautiful productions exalt and purify the mind. Many tribes, in a very rude state of society, exhibit much sensibility to music, and derive much pleasure from the simple strains in which, taught by nature alone, they give expression to their feelings; and there is no doubt, that even to their untutored minds, music, such as they possess, is a source of much higher and better enjoyment than the mere gratification of sense. But it is only, we repeat, where music has become an art, and where its exercise is invested with the dignity of an intellectual pursuit, that its effects as an instrument of civilization and moral improvement become evident and striking.

There is no country in which the moral and social

* The editors think it proper to mention that the present treatise is the composition of Mr. George Hogarth, author of "Musical History," and "Memoirs of the Musical Drama."

agency of music is so remarkable as in Germany. In the various countries which compose that wide region, the national character has been much refined and softened in the course of a few generations; and, in this progress, the operation of music can be palpably traced. Its effects in this point of view are described with equal truth and eloquence by M. Mainzer, in the introduction to his work of popular instruction, entitled, "Singing for the Million." After describing the measures pursued in the principal states of Germany for the diffusion of musical knowledge among the people, this writer says—"As may be naturally supposed, from all that we have here stated, in the boarding-schools for the upper classes, singing and the art of music are cultivated with still greater care, and the instruction therein given assumes a high and artistical character. In gymnasiums, singing and drawing are considered as important as the classics, history, and mathematics; art and its principles are studied equally and simultaneously with science. In the military schools, which every common soldier is compelled to attend for the purpose of obtaining instruction in reading, writing, arithmetic and the fundamental principles of the art of war, the elements of singing are likewise taught. Hence, the soldiers may be frequently heard performing songs in four parts in the streets in front of their barracks; whole battalions sing when marching in the morning to the place of exercise, and, on their return, no fatigue prevents them from singing their chorusses in full voice, and thus enjoying a useful and agreeable recreation. If any one visit the orphan asylums for both sexes, he will find that the lessons begin and end with singing: in the churches to which they belong, the children sing with a fervour of soul which elevates them to those spheres of happiness where the cruel destiny that but too often clouds their dawning existence is for the time forgotten. In Germany, more than any other country, it may be seen how peculiar a charm singing gives to the existence of children, and how much animation to the manners of the people; how happy is the influence it exerts on schools and national festivals; and how much, on the whole, it contributes to the welfare of the nation."

The French have never been regarded as a particularly musical people, and yet the effects produced among them by the systems of popular instruction introduced by M. Mainzer and M. Wilhem have been very considerable. In Great Britain both these systems are now in operation. Our government, following the example of the French, has bestowed its patronage on the method of Wilhem, which has been adapted to English use by Mr. Hullah; while M. Mainzer, in carrying on his system, relies wholly on the support of the public. Both systems are already widely spread, and both are likely to be very efficient. As usual in such cases, a spirit of partisanship has been excited regarding them, and the advocates of the one seem to think it necessary to depreciate the other. Any such feeling we utterly disclaim; we have carefully examined both systems, to which we shall specially refer in the sequel, and have here only to observe, that being convinced of the benefits which both may confer in a country which presents an ample field for their operation, they have our hearty wishes for their success.

It is, of course, to the more wealthy and educated classes of society that the attainment of scientific knowledge and technical skill in music has been hitherto confined. At this day, even these classes in this country have little to boast of in this respect; much less, indeed, than they had two or three centuries ago. In the sixteenth and seventeenth centuries, the music chiefly cultivated in England consisted of *vocal harmony*, and the performance of the inimitable *madrigals* of the Italian and English masters of that age was regarded as a most elegant pastime, in which every one who had pretensions to the habits and manners of good society was supposed capable of participating. Every musical student, as far as his means and opportunities permit, ought to follow the example set in these times, and study both the theory and practice of harmony; for it is impossible either to acquire a respectable degree of proficiency in the practice of music, or to derive real pleasure from it as a liberal and intellectual pursuit, without that expansion of mind which is derived from a knowledge of its principles.

This study ought to be conjoined with the practice of singing or performance on some instrument. Great facilities will be afforded by being able to play ever so little on the pianoforte; to do which, in so far as to realize to the ear the effect of successions of chords and combinations of harmony, is a matter of no difficult attainment. People will prosecute the study in different ways, and carry it different lengths, according to their different dispositions, opportunities, and views. But we may say in general, that a familiarity with the principles which we shall attempt to develop, combined with moderate skill and readiness in singing or playing on an instrument, will produce that enlargement of view which is requisite for the full comprehension and enjoyment of the noblest productions of the art. We may add, that the study of harmony will be more pleasantly and successfully followed as a domestic and social pastime than as a solitary pursuit. Members of a family may follow it together; or a circle of friends and companions may form themselves into a little class for the purpose. Supposing them to have profited by the methods of instruction, now so easily accessible, so as to be able to sing from the notes vocal passages of the simplest kind (if with a pianoforte, so much the better, though it may be dispensed with), they will find little difficulty in mastering the contents of the following pages. And they will find it equally improving and interesting to discover the application of the various rules and principles of harmony which they are thus acquiring, in every grand or beautiful composition in the performance of which they may have occasion to join.

With these prefatory remarks, we proceed to an account of the theory of music, commencing with

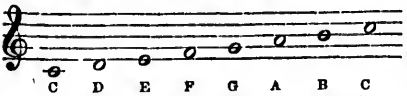
THE SCALE.

Music is composed of sounds produced by the human voice, or by instruments constructed for that purpose, varying in pitch according to certain fixed and determinate degrees. The gradation of these sounds, from the lowest, or most grave, to the highest, or most acute, forms what is called the *musical scale*, a scale evidently derived from nature, since, though it has been found to be more or less complete in different times and places, it is the same in its principal degrees in all parts of the world. By using the different sounds or notes of this scale in succession, in such a manner as to give pleasure to the ear, *melody* is produced; by using two or more of them at the same time, in such a manner as to be agreeable, *harmony* is formed. Melody, in its simpler forms, is immediately dictated by nature, as no people or tribe, however rude, seems ever to have been destitute of it. Harmony, though its effects, as well as those of melody, must be founded in nature, has never been found to exist unless where music has received a considerable measure of artificial culture.

The natural scale of musical sounds, though its extent is limited only by the bounds of the human voice, or of the different instruments, consists only of seven notes, for it is found that if, after singing or playing these seven notes, we continue the series, we repeat another scale similar to the first, and so on, as far as the extent of the voice or the instrument will go.

To express these sounds by means of notation, various expedients, in the progress of music, have been resorted to, which have been gradually improved, till the

now in use has been adopted. It consists in drawing five parallel lines, and in placing on them, and in the spaces between them, marks representing the notes of the scale. At the same time, the notes have received distinguishing names, either letters of the alphabet, or syllables used for that purpose. Thus:



C D E F G A B C
Do Re Mi Fa Sol La Si Do

There are only seven letters or syllables, because, as already mentioned, there are only seven notes in the scale. In the above figure, the last note bears the same name as the first; and if the series of sounds is carried further, the same names will be repeated. The last of the above notes, C, being the eighth from the first, is called its *octave;* and the whole series, of which it forms the beginning and the end, is called an octave.

In examining the above series of sounds or octave, from C to C, it will be found that the steps of the scale are unequal; the distance between the third and fourth notes, E and F, and between the seventh and eighth, B and C, being smaller than the others. In singing the scale, this is at once felt to be the case. While, therefore, the interval between C and D, D and E, F and G, G and A, and A and B, is called a *tone*, the smaller interval between E and F, and between B and C, is called a *semitone*.

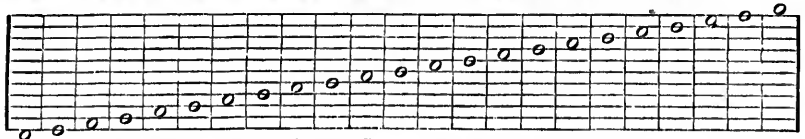
The scale, therefore, to whatever extent it may be carried, from the gravest note that can be produced to the shrillest or most acute, consists of a series of octaves; and in each octave, the interval between the third note and the fourth, and between the seventh and eighth, is a *semitone*, while the other intervals between a note and that next it are *tones*.

It is easy to perceive that the five lines (or *staff*, as it is called) above described, can comprise but a small portion of the musical scale, which is of indefinite extent, and limited only by the capacities of the human voice, or of instruments. The explanations now to be given are applicable to the voice, the original musical instrument, from which all others are derived.

The voices of women and boys are more acute, higher in pitch, than those of men. If a man or a woman sing the same tune, they will, if untaught, suppose that they are singing the same notes, or in unison, whereas the one is singing an octave above the other. It is for this reason that a note and its octave are designated by the same letter or syllable.

The great divisions of the voice, then, are into the *male* and the *female*. But males, as well as females, differ in the pitch of their voice; and this difference produces a subdivision. The male voice of the highest pitch is called the *tenor;* of the lowest pitch, the *bass*. The female voice of the highest pitch is called the *treble* or *soprano;* of the lowest pitch, the *contralto*.

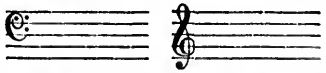
Persons possessed of each of these varieties of voice have, generally speaking, pretty nearly the same range or compass of notes. Each voice, at an average, may be said to contain eleven or twelve notes, some more, and some less. Were we to draw a staff of *eleven* lines, placing the notes upon the lines, and in the spaces between them, we could comprehend the whole extent of the ordinary vocal scale, from the lowest note of the bass to the highest note of the treble, thus:—



F G A B C D E F G A B C D E F G A B C D E F G

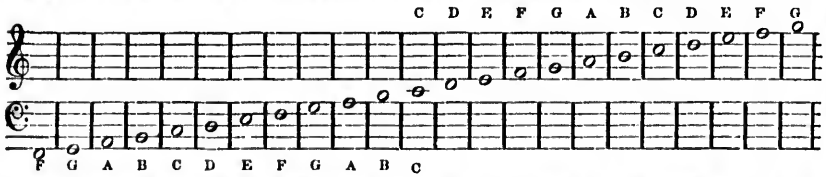
But it is evident that this would be cumbrous, and that the number of lines would produce confusion to the eye. It is found that five lines are generally sufficient for the extent of any one voice, by adding the simple expedient, when a note happens to go either above or below the five lines, of drawing an additional little line for that note, which is called a *leger* line. By this means the staff, when necessary, may be increased to six, seven, or more lines; but too many leger lines must be avoided, as they render the notation confused.

Five lines, therefore, are taken out of the above eleven, to form a staff for any one voice; but each voice will require a different set of lines. The two great divisions of voice are the bass and the treble; for the bass we take the five lowest lines, for the treble the five highest. In order to distinguish these staves from each other, we employ two arbitrary marks, the one for the bass, and the other for the treble; thus:—



The first is called the *bass*, or F clef, because it is placed on the line which has the note F. The other is called the *treble*, or G clef, because it stands on the line which has the note G, as seen in the above eleven lines.

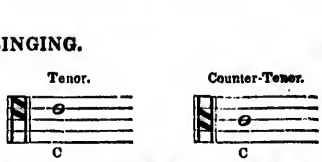
Of these eleven lines, the five lowest being used for the bass staff, and the five highest for the treble staff, one line remains in the middle, which is common to both, and may be represented by a leger line above the bass staff, or below the treble staff.



This is precisely the same as the above diagram of eleven lines, except that the middle note, C, is placed on a leger line instead of a line prolonged like the others.

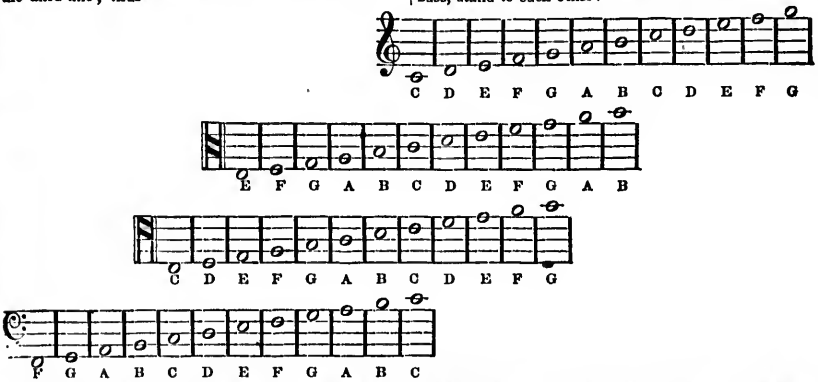
The above are the two clefs most generally used in music, and were there no other than bass and treble voices, no other clefs would be necessary. But we have seen that there are also *tenor*, and *contralto* (or *counter-tenor*) voices: the range or compass of the tenor being four or five notes higher than the bass, and the compass of the counter-tenor being about an octave higher than

the bass. The tenor part might be written on the bass clef, but the notes would not be spread over the five lines. The lower lines and spaces would be left empty, while the higher notes would require leger lines. The same inconvenience would arise from writing the counter-tenor part on the treble clef. Two other staves, or sets of five lines, therefore, are used for the tenor and counter-tenor parts. Both of them are distinguished by a mark called the C clef; but this mark, for the tenor, is placed on the fourth line, and, for the counter-tenor, on the third line; thus—

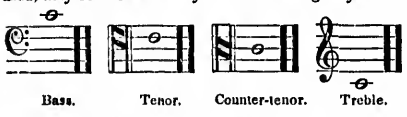


The C, in both these staves, is the same; and it is moreover, the C which stands on the leger line between the treble and base staves.

The following diagram will show the relation in which the different clefs, the treble, counter-tenor, tenor, and bass, stand to each other:—



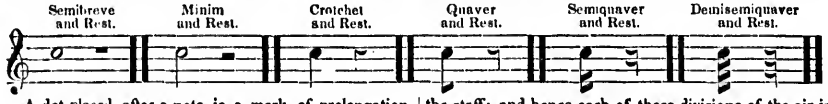
This, we apprehend, explains itself. The notes which are perpendicular to each other express the same sound. As, for example, the middle C, according to the clef used, may be written in any of the following ways:—



It is requisite to observe, however, that, though the above clefs are necessary for the clear and correct notation of music for different voices, yet in music printed for popular use, the use of the *tenor* and *counter-tenor* clefs is now very generally dispensed with, the parts for these voices being written in the treble clef, an octave above the real notes intended to be sung. But the learner should not neglect the knowledge of these clefs, as they are always used in music of a high class. In the examples of harmony given throughout the following pages, the treble and bass clefs only are used, the harmony, even when in four parts, being written in two staves. But the learner will find it a useful exercise to write out these examples in as many staves as there are parts, giving to each part its proper clef.

TIME.

Thus much for the notation of sounds, in relation to their pitch. But musical notes are not only high and low, they are also *long* and *short;* and their relative proportions to each other in this respect are expressed by differences in the form of the notes. The longest note in modern use is represented by a circle, as in the previous examples, and is called a *semibreve*. A note of half its length is called a *minim;* a quarter, a *crotchet;* an eighth, a *quaver;* a sixteenth, a *semiquaver;* and a thirty-second, a *demisemiquaver*. They are written thus—

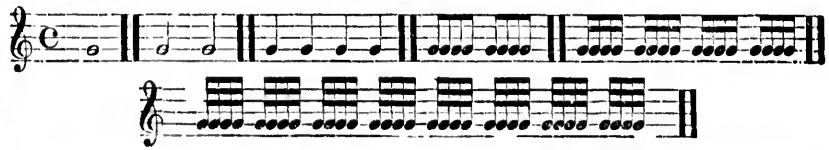


A dot placed after a note is a mark of prolongation. A dotted semibreve is equal to three minims instead of two; a dotted minim to three crotchets; a dotted crotchet to three quavers: a dotted quaver to three semiquavers; and a dotted semiquaver to three demi-semiquavers.

Measure, or *rhythm*, is one of the essential attributes of music. Everybody knows the meaning of *beating time* to a tune. By beating time, the tune or melody is divided into a number of equal parts, which in musical notation are marked by lines or bars, drawn across the staff; and hence each of these divisions of the air is called a *bar*.

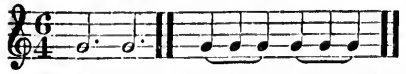
Each portion of the melody, comprised within the limits of a bar, is also divided into *equal* parts. Sometimes the bar is divided into *two* equal parts, and sometimes into *three*. In the former case, the melody is said to be in *common time;* in the latter, in *triple time*.

There are various kinds of *common* as well as of triple time. The first kind of common time consists of *one semibreve* (or shorter notes equal to one semibreve) in each bar. It is marked C; thus—



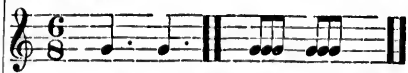
The second kind of common time consists of one *minim* (or shorter notes equal to one minim) in each bar. It is marked $\frac{2}{4}$, meaning, that it contains two fourth-parts of a semibreve (or two crotchets) in a bar:—

The third kind of common time is marked $\frac{6}{4}$. It consists of six crotchets in a bar: but these are divided into two equal parts, each of which is equal to a *dotted minim*, or what is called a *triplet* of three crotchets.

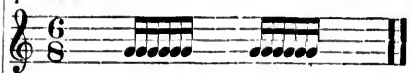


These six crotchets are divided into two triplets by *accenting* the first note of each triplet, or sounding it a little more strongly than the others. This species of time is now rarely used.

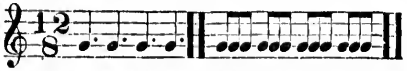
The fourth kind of common time is marked $\frac{6}{8}$. It consists of six quavers in a bar, divided into two equal parts, each of which is a dotted crotchet, or a triplet of three quavers.



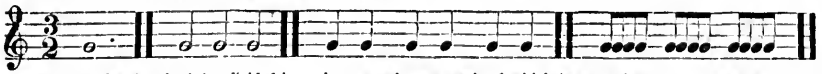
Each of these triplets may be divided into six semiquavers.



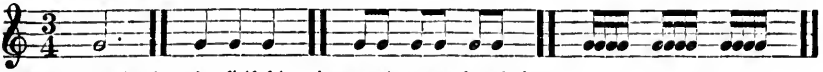
The last kind of common time is marked $\frac{12}{8}$, and consists of four dotted crotchets, each of which may be divided into a triplet of three quavers. The bar of $\frac{12}{8}$ is just two bars of $\frac{6}{8}$ thrown into one.



Triple time consists, first, of a *dotted semibreve*, divided into three equal parts, each of which is a minim, or two crotchets, or four quavers. This is now seldom used.

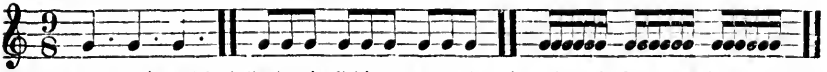


Secondly, of a *dotted minim*, divided into three equal parts, each of which is a crotchet, or two quavers, or four semiquavers, and marked $\frac{3}{4}$.

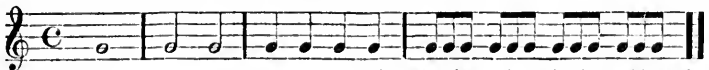


Thirdly, of a *dotted crotchet*, divided into three equal parts, and marked $\frac{3}{8}$.

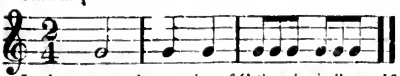
Lastly, of *three dotted crotchets*, and marked $\frac{9}{8}$.



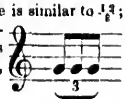
Although the dot is used for indicating the division of a note into three (instead of two) equal parts, yet it is common to divide notes into triplets without the use of the dot. Thus, in common time of a semibreve in a bar, it may be divided thus—



And in $\frac{2}{4}$ time—



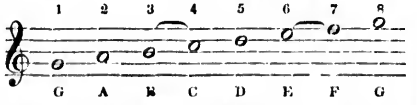
In these cases, the notation of C time is similar to $\frac{12}{8}$; and $\frac{2}{4}$ to $\frac{6}{8}$. When a note, without being dotted, is thus divided the triplet is frequently marked with a small figure 3, but this is not always done.



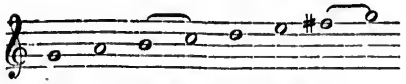
DIVERSITY OF KEYS.

It has been already shown that the scale consists of a series (more or less extended) of *octaves*; and that in each octave the intervals between the third and fourth note, and between the seventh and eighth, are *semitones*; all the other intervals between two adjoining notes being *tones*. It is this inequality in the intervals which produces the tune or melody of the scale.

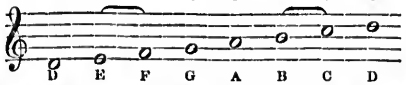
In singing this scale, we may begin upon any note at pleasure; and this note, whatever it may be, is called the *key-note*. But on whatever note we begin to sing the scale, we must, in order to preserve its tune or melody, place the *semitones* in the positions already mentioned; that is, between the third and fourth notes, and between the seventh and eighth. We have already exemplified the scale, as commencing on the note C. Take it now upon another note—suppose G.



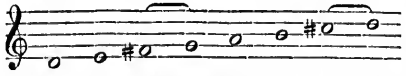
But one of the intervals in this scale is not in its proper place. The interval from E to F, which (as we have seen) is a semitone, is here between the sixth and seventh instead of being between the seventh and eighth; while the interval between the seventh and eighth is a tone, instead of being (as it ought) a semitone. The other semitone, from B to C, is in its right position. To correct this, it is only necessary to *raise the pitch* of the note F, so as to make it a whole tone higher than E and consequently a semitone lower than G. A new note is thus obtained, called F *sharp*, which is distinguished by a particular mark, as under—



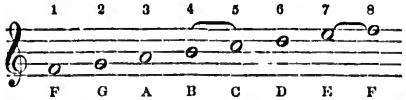
Again, commence the scale on the note D—



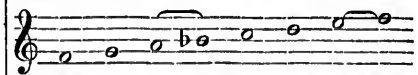
Here two of the semitones are out of their proper places, as may be seen at a glance. But we correct the position of the first semitone by raising the pitch of the note F, as in the previous example, and we correct the position of the second semitone by raising the pitch of the note C. Thus—



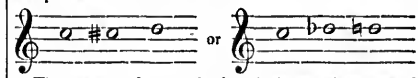
Take now the note F as the key-note or foundation of the scale.



Here the first semitone is misplaced, being between the fourth and fifth instead of the third and fourth. The other semitone is rightly placed. To correct this, it is necessary to *depress* the pitch of the fourth note B, in order to bring it nearer to the A; and the new note thus obtained is called B flat, distinguished by a mark, as under—

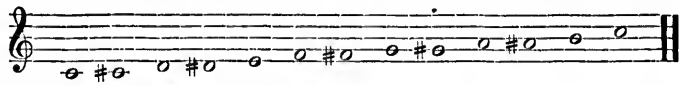


In this manner the learner may form a new scale on every note of the octave, and we recommend it to him as a useful exercise. In doing so, he will find that every interval of a tone may be divided into two semitones, by placing between the two notes a third note, at the distance of a semitone from each. And this third note may be obtained by raising the pitch of the lower of the two notes, or by lowering the pitch of the higher. Thus, the tone between C and D may be divided into two semitones, by inserting between these notes either a C sharp or a D flat.

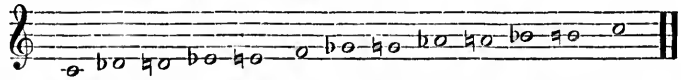


The mark prefixed to the last D is called a *natural*. When the pitch of a note has been raised or lowered by a sharp or a flat, this mark indicates that the note so altered is restored to its natural pitch.

By thus dividing every tone into semitones, a new scale may be formed, consisting entirely of semitones. In the first place, it may be formed by raising the pitch of each note, excepting where semitones already exist—



Or it may be formed by depressing the pitch of each note—



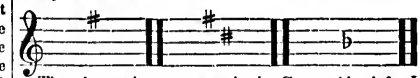
In both these scales, the intervals between E and F, and between B and C, being semitones at any rate, undergo no alteration.

The scale which thus proceeds entirely by semitones is called the *Chromatic* scale, to distinguish it from the natural, which is called the *Diatonic* scale.

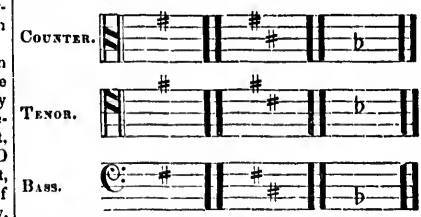
The chromatic scale, formed by *sharps*, is not precisely the same as that formed by *flats*, as the interval called a semitone is not the exact half of a tone. But the difference is so minute as to be in some measure disregarded in practice; and on keyed instruments (the organ and pianoforte) the two chromatic scales are played in the same way; the C sharp and D flat, D sharp and E flat, &c., being considered the same sounds. But though these sounds may seem the same to the ear, it is evident, from the preceding account of the formation of the scale, that they must not be confounded in musical notation.

By the formation of the chromatic scale, we obtain *twelve* notes in each octave; and upon every one of these notes a scale may be formed; or, in other words, every one of these notes may be taken as a key-note. Moreover, as several of the notes appear in a double aspect, though identical in sound (as C sharp and D flat, D sharp and E flat, F sharp and G flat, G sharp and A flat, and A sharp and B flat), each of these double forms of the same note gives rise to a different scale or key, which, though consisting of the same sounds, must be differently noted.

Each scale or key is distinguished by a *signature*, pointing out the notes which have been altered from the natural scale, by means of sharps or flats. The scale commencing on G, for example, contains one altered note, F sharp; and the signature placed at the beginning of a piece of music in the key of G, shows that wherever F occurs, it is sharp. The signature of the key of D shows that F and C, wherever they occur, are sharp. The signature of the key of F shows that the B is always flat, and so on.



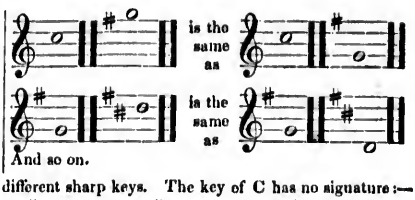
The above signatures are in the G or treble clef. In the C, or tenor and counter-tenor, and F, or bass clef, they must vary according to the clef.



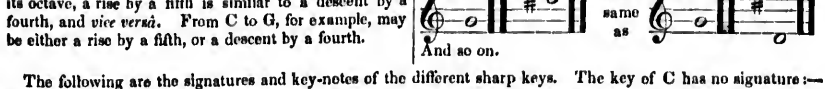
In the *sharp* keys, the series of key-notes proceeds from the natural key of C *upwards by fifths*. G, the fifth above C, has one sharp; D, the fifth above G, has two sharps; A, the fifth above D, has three sharps, &c. In

the *flat* keys, the series of key-notes proceeds from C *downwards by fifths*. F, the fifth below C, has one flat; B flat, the fifth below F, has two flats; E flat, the fifth below B flat, has three flats, &c.

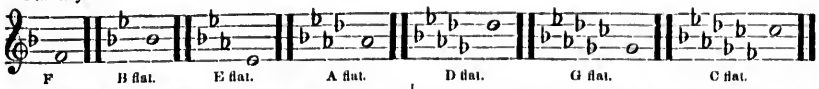
Observe that, from the similarity between a note and its octave, a rise by a fifth is similar to a descent by a fourth, and *vice versâ*. From C to G, for example, may be either a rise by a fifth, or a descent by a fourth.



The following are the signatures and key-notes of the different sharp keys. The key of C has no signature:—

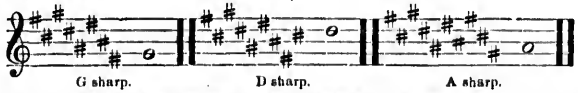


Flat keys—



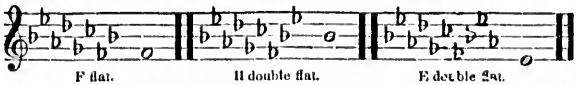
From what has been said, it will appear that several of these scales, though differently noted, are played on the pianoforte with the same keys. Thus, C sharp, with seven sharps at the signature, is the same as D flat, with five flats; C flat, with seven flats, is the same as B with five sharps; and F sharp, with six sharps, is the same as G flat with six flats.

The above are the principal sharp and flat keys, with the use of which it is necessary to be familiar; but there are others occasionally but rarely used. And, indeed, the series, whether of sharp or flat keys, may be carried out indefinitely. To the sharp series we may add—



In the key of G sharp, the F is raised two semitones; in D sharp, the F and C are each raised two semitones; and in A sharp, the F, C, and G, are each raised two semitones. The notes thus doubly raised are marked, when they occur, with a ×, called a *double sharp*. But it is hardly ever necessary to use keys with such a multitude of sharps; because, by using flat signatures, the same notes may be much more simply expressed. A passage in the key of G sharp, with eight sharps, may be written in A flat with four flats. For D sharp, with nine sharps, we can substitute E flat, with three flats; and for A sharp, with ten sharps, we can substitute B flat, with two flats.

To the flat series we may add—

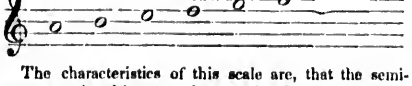


But these may be more simply written with sharp signatures. For F flat, we may substitute E natural (the same sound), with the signature of four sharps; for B double flat, we may substitute A, with three sharps; and for E double flat, we may substitute D, with two sharps. Nevertheless, it is necessary to be acquainted with these out-of-the-way keys; because, though entire pieces of music are never written in them, yet transient passages belonging to them are met with in learned and complex compositions.

THE MINOR SCALE.

The scale hitherto described, in which the semitones stand between the third and fourth, and between the seventh and eighth, is called the *major* scale, to distinguish it from another, called the *minor* scale.

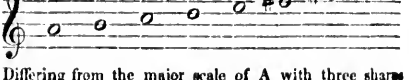
If we commence on the *sixth* note of the scale already described, and ascend to its octave, without altering the natural notes, we have the minor scale. Taking A, as he sixth note of the scale of C, we have—



The characteristics of this scale are, that the semitones are placed between the *second* and *third* notes, and between the *fifth* and *sixth*. In singing this scale, it will be felt that this position of the semitones gives the tune or melody a melancholy expression, which distinguishes it from the major scale.

It is, especially, the difference between the interval of the *third* in the two scales which is their distinguishing feature. In the major scale, as we have seen, the interval between the key-note and the third consists of two tones; in the minor scale, the intervals between the key-note and third consists of a tone and semitone. The one kind of third is called a *major third*, the other a *minor third*.

The other marks which distinguish the above minor scale from a major scale, namely, the semitone between the fifth and sixth, and the whole tone between the seventh and the eighth, are not always preserved. It is one of the refinements of modern music, that in rising from the seventh to the eighth, we always do so by a semitone, whether the scale be major or minor. When this is done, the sixth note of the scale is also raised a semitone: so that the *ascending* minor scale generally stands thus:



Differing from the major scale of A with three sharps only in the circumstance that the *third* is minor.

The minor scale thus admits of some variety. It may be written in either of the above ways, or, while the

seventh is sharpened, the sixth may remain unaltered. But the scale, whether ascending or descending, is considered as consisting of the notes given in the first example. The minor scale of A, therefore, has no signature at the clef, the sixth and seventh notes being marked with sharps only when they occur, so altered, in the course of the piece.

Every minor scale, being formed on the sixth note of a major scale, is said to be *relative* to the major scale on which it is so formed.

Thus, the minor scale of A is relative to the major of C

The minor of E to the major of G

.. .. B .. .. D

.. .. F♯ .. .. A

.. .. C♯ .. .. E

.. .. G♯ .. .. B

.. .. D♯ .. .. F♯

.. .. A♯ .. .. C♯

Flat keys—

The minor of D is relative to the major of F

.. .. G .. .. B♭

.. .. C .. .. E♭

.. .. F .. .. A♭

.. .. B♭ .. .. D♭

.. .. E♭ .. .. G♭

.. .. A♭ .. .. C♭

The signature of every minor key is the same as that of its relative major. Thus, C major and A minor have no sharp or flat at the clef; G major and E minor have one sharp; D major and B minor have two sharps; F major and D minor have one flat; B flat major and G minor have two flats; and so on. Let the learner, as an exercise, write all the relative major and minor keys, with their proper signatures.

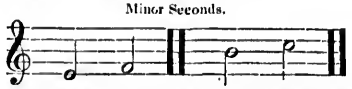
INTERVALS OF THE SCALE.

The next object of attention ought to be the *intervals* of the diatonic scale. This scale may be called the alphabet of music; as from the various successions and combinations of these sounds the beauties of melody and harmony are derived.

The intervals of the scale are expressed by numbers, and are called the second, third, fourth, fifth, sixth, seventh, and eighth, or octave. Each of them is of different kinds.

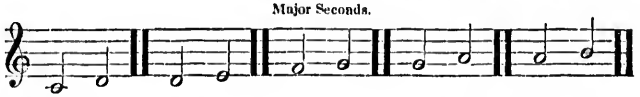
The *second* is *major* and *minor*. The *minor second*, or *semitone*, is the interval between the third and fourth notes of the scale, and between the seventh and eighth. In the key of C, these intervals are—

Minor Seconds.



The *major second*, or tone, is the interval between any other note of the scale and that immediately adjoining, as between C and D, D and E, F and G, &c.—

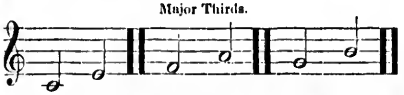
Major Seconds.



The third is *major* and *minor*.

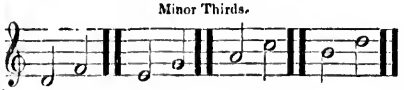
The *major third* consists of two tones; as between C and E, F and A, G and B—

Major Thirds.



The *minor third* consists of a tone and a semitone; as between D and F, E and G, A and C, B and D—

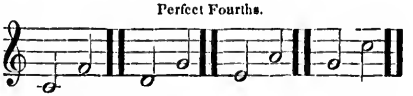
Minor Thirds.



The *fourth* is *perfect* and *sharp*.

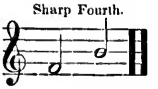
The *perfect fourth* consists of a major third and a semitone, or of a minor third and a tone; as between C and F, D and G, E and A, G and C—

Perfect Fourths.



The *sharp fourth* consists of a major third and a tone, or of three tones (whence it is sometimes called the *tritone*); as between F and B.

Sharp Fourth.



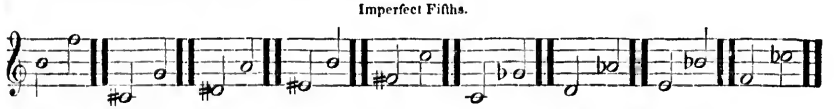
The *fifth* is *perfect*, and *imperfect* or *flat*.

The *perfect fifth* consists of a major and a minor third or of three tones and a semitone; as between C and G, D and A, E and B, F and C—

Perfect Fifths.

The *imperfect* or *flat fifth* is the perfect fifth diminished by a semitone; as between B and the F of the next octave, or between any of the above perfect fifths, after the lower note has been raised, or the upper note depressed by a semitone; as between C sharp and G, D sharp and A, E sharp and B, F sharp and C; or between C and G flat, D and A flat, E and B flat, or F and C flat—

Imperfect Fifths.

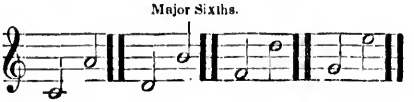


The *sixth* is *major* and *minor*.

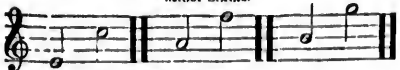
The *major sixth* consists of a perfect fifth and a tone; as between C and A, D and B, F and D, G and E.

The *minor sixth* consists of a perfect fifth and a semitone; as between E and C, A and F, B and G—

Major Sixths.



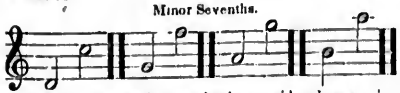
Minor Sixths.



The *seventh* is *major* and *minor*.

The *minor seventh* consists of a major sixth and a *semitone*; as between D and C, G and F, A and G, B and A

Minor Sevenths.



The minor seventh may also be considered as a minor sixth and a tone, or as a fifth and a minor third, or as an octave wanting a tone.

The *major seventh* consists of a major sixth and a tone; as between C and B, F and E –

Major Sevenths.

The major seventh is an octave wanting a semitone.

The octave is from a note to another of the same denomination; as from C to C, D to D, &c.

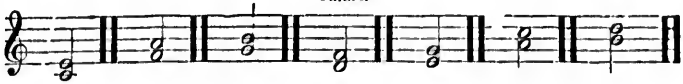
Intervals which extend beyond an octave are, the *ninth*, *tenth*, *eleventh*, *twelfth*, &c., though it is seldom found necessary to extend these denominations further. From the relation between a sound and its octave, it follows that similar relations exist between these larger intervals and those already enumerated. Thus, the *ninth* is considered as corresponding to the *second*, the *tenth* to the *third*, the *eleventh* to the *fourth*, and the *twelfth* to the *fifth*.

The above are all the intervals which are derived from the *diatonic scale*. There are several others derived from the *chromatic scale*; but to these it is not necessary to advert at present. A familiar acquaintance, however, with those already enumerated, is absolutely necessary, as their names and properties occur at every step of the learner's progress.

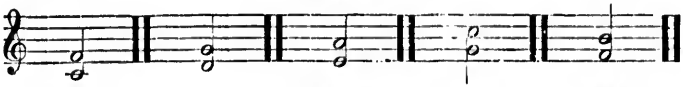
Intervals are considered as being, not only between two notes sounded successively, but between two notes sounded together. In the one case, they are intervals of melody; in the other, they are intervals of harmony. Intervals of melody are written as above, intervals of harmony as under—

Seconds.

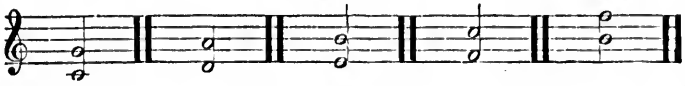
Thirds.



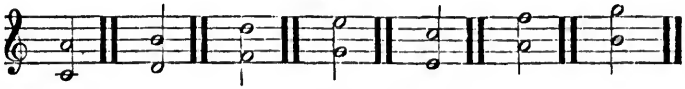
Fourths. Imperfect.



Fifths. Imperfect.

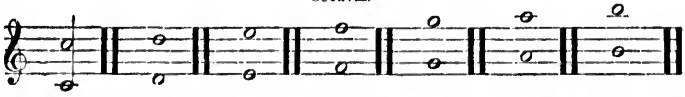


Sixths



Sevenths.

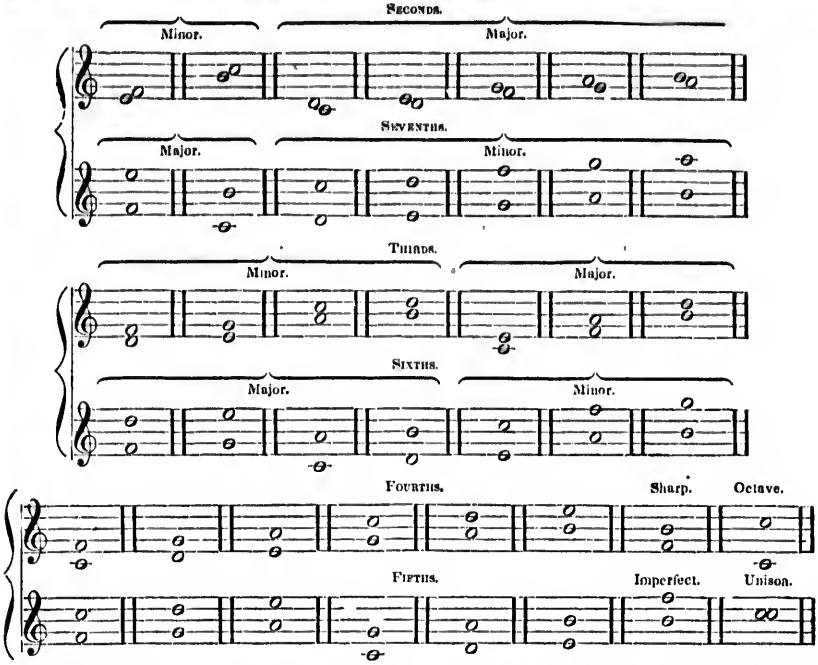
Octaves.



Intervals may be inverted; that is, the lower note, by being raised an octave, may be placed uppermost; or the upper note, by being lowered an octave, may be placed undermost.

By inversion, a second is changed to a seventh, and a seventh to a second; a third is changed to a sixth, and a sixth to a third; a fourth to a fifth, and a fifth to a fourth.

Major intervals are changed to minor, and minor intervals are changed to major. A minor second becomes a major seventh, and a major second becomes a minor seventh. A major third becomes a minor sixth, and a minor third becomes a major sixth; and so on, as in the following examples:—



Intervals are divided into *Consonant* and *Dissonant*.

When two (or more) notes are heard at the same time, it is found that some of these intervals are agreeable and others disagreeable to the ear. The intervals which form the agreeable combinations are called *consonant*, the others *dissonant*. Harmony is not confined to the use of consonant intervals or *concords* only. On the contrary, the admixture of dissonant intervals, or *discords*, produces many of its greatest beauties.

The consonant intervals are the *major* and *minor third*, the *fifth*, and the *octave*, with their *inversions*; namely, the *major* and *minor sixth*, and the *fourth*. The *unison* also may be included; because, though it cannot properly be called an interval, yet it is the inversion of the octave; and when used by two or more voices, is agreeable to the ear, and of use in harmony.

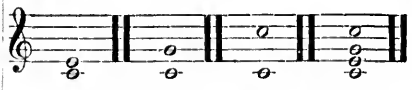
It must, however, be remarked, that, though the inversion of the third (the sixth) is as agreeable to the ear as the third itself, yet this is by no means the case with the inversion of the fifth (the *fourth*); which is so much less agreeable than the fifth, that it requires (as will be afterwards shown) some of the precautions required in the use of discords.

The dissonant intervals are the *major* and *minor second*, the *sharp fourth*, the *imperfect fifth*, and the *major* and *minor seventh*.

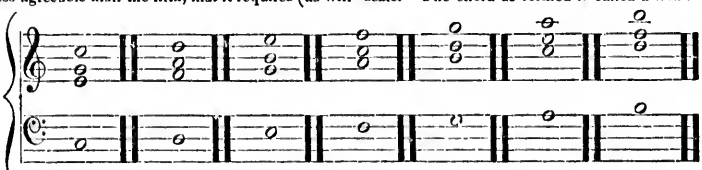
The *major* and *minor ninth* (the octave of the second) are also dissonant intervals.

CLASSIFICATION OF CHORDS.

Where any note is heard, along with its third (major or minor), its fifth, or its octave, or with all these together, the combination (called a *chord*) thus produced is agreeable to the ear—



Such a chord may be formed upon every note of the scale. The chord so formed is called a *triad*—



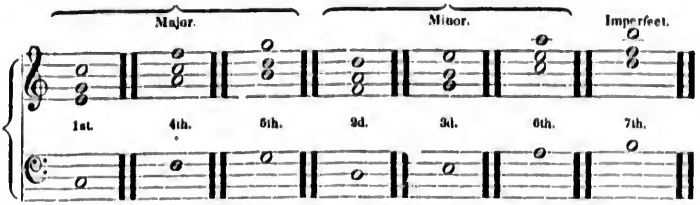
The above chords will be found to be of three kinds.

The first kind consists of the fundamental note, with its *major third*, *fifth*, and *octave*, and is formed upon the *key-note*, the *fourth*, and *fifth* of the scale. It is called the *major triad*.

The second kind consists of the *minor third*, *fifth*, and *octave*, and is formed upon the *second*, *third*, and *sixth* notes of the scale. It is called the *minor triad*.

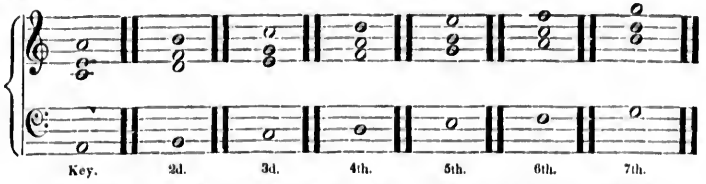
The third kind consists of the *minor third*, the *imperfect fifth*, and *octave*, and is formed on the *seventh* note of the scale. As this chord contains a dissonant interval (*imperfect* fifth), it is much more sparingly used, and with greater precautions, than the others. It is called the imperfect *triad*.

Triads.

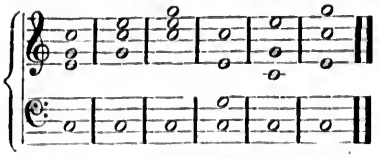


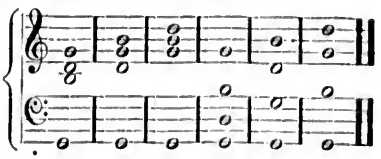
The above triads are formed upon the scale in the key of C major. It would unnecessarily multiply examples to exhibit the formation of the triads in the other keys. This the learner can do for himself; and it may be added (once for all), that the examples and exercises given in the sequel ought to be written by the learner in a variety of keys, in order to make him familiar with the practice of transposition.

The *minor scale* will give the same triads, but differently placed—



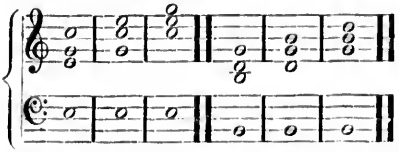
The notes of which a triad consists may be taken in different *positions*; for example—



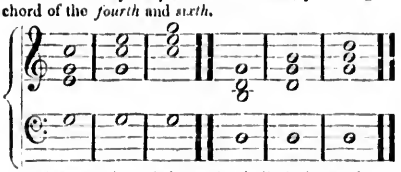


In changing the *position* of a triad, the fundamental note remains in the lowest place, or in the *bass*. But the triad may also undergo different *inversions*, by placing the third or the fifth in the lowest place, or bass.

The *third* may be placed in the bass, producing the chord of the *third* and *sixth**—



The fifth may be placed in the bass, producing the chord of the *fourth* and *sixth*.



And every other triad may be similarly inverted.

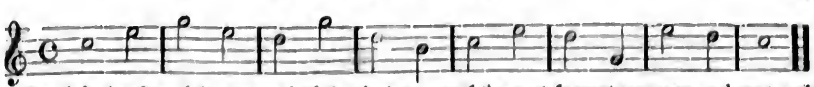
Progression of Chords.

Although every note of the scale may thus be made the foundation of a triad (or *common chord*, as it is also called), yet, in forming a harmonious series of triads, they cannot be made to follow each other at pleasure; but their succession must depend on certain rules deduced from the position of their fundamental note in the scale to which it belongs.

In every scale, the most essential note is the *key-note*, or *tonic*. The note, or one of the notes contained in its triad, begins and ends every strain of melody or harmony, and recurs so frequently that its impression is never lost upon the ear. Melodies frequently consist entirely of the notes of this triad—

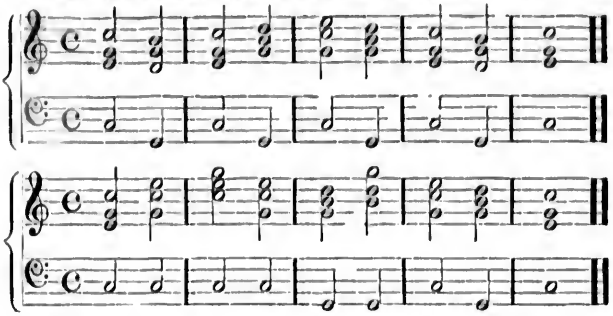
Next to the key-note, or tonic, the most essential note is the *fifth* of the scale, called, from its importance, the *dominant* or ruling note. By adding this note, and the notes of its triad, to those of the tonic, a larger field of melody and harmony is thrown open.

* In the present treatise, we make no use of the method of marking the different positions and inversions of chords by means of what are called *thorough bass figures*. It is a rude and clumsy contrivance, invented in the very infancy of the art of harmony, superseded by a better system of notation, and entirely discontinued in modern practice. It still continues to encumber books of instruction, because its acquirement is considered useful in order to read old music still extant, in the notation of which the figures were used. But this reason is becoming weaker every day, as most of the classical compositions of the old masters have been (or are being) reprinted in the modern manner of notation.

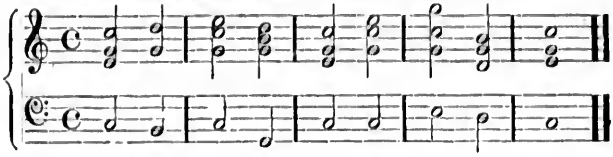


The triads, therefore, of the *tonic* and of the *dominant* are of the most frequent occurrence, and most easily alternate with each other.

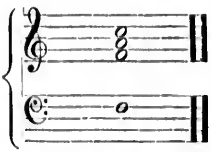
Alternations between the *tonic* and *dominant*, in different *positions*—.



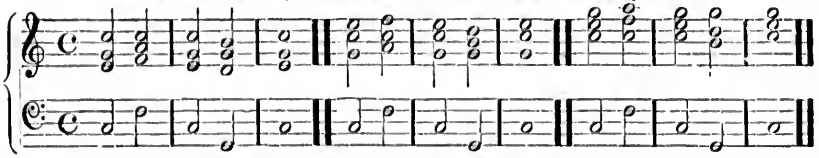
Alternations between the *tonic* and *dominant*, in different *inversions*—



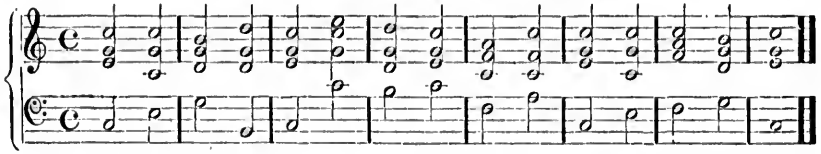
After the tonic and dominant comes the *fourth* of the scale, called the *subdominant*, with its triad—



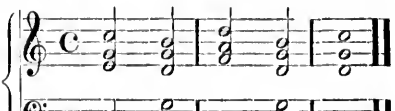
Alternations of the tonic, dominant, and subdominant triads, in different *positions*—



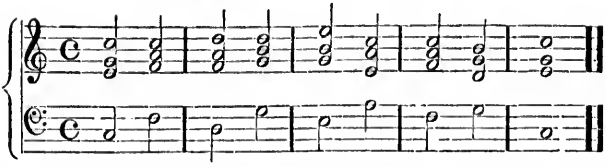
Alternations of these three triads, in different *inversions*—



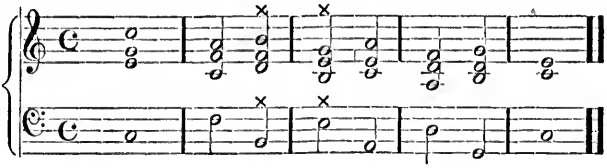
The triad on the second note of the scale (called the *supertonic*) is the next, in frequency of use, to the preceding three. Its employment may be understood from the following example:—



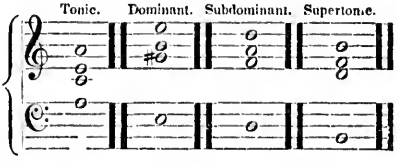
The above four triads—the tonic, dominant, subdominant, and supertonic—are the most essential. But the triads upon the *third* and the *sixth* notes of the scale (E and A in the scale of C) are also in frequent use, blended with the others; as follows—



The only remaining triad is that on the *seventh* note of the scale, or the *imperfect* triad. One of its intervals (the imperfect fifth) being dissonant, it is much less frequently used than any of the other triads. In order to diminish its harshness, the dissonant note must fall, in the following chord, to the note immediately below it. Thus F, the dissonant note in the triad of B, must fall to E. This is called *resolving* the discord—

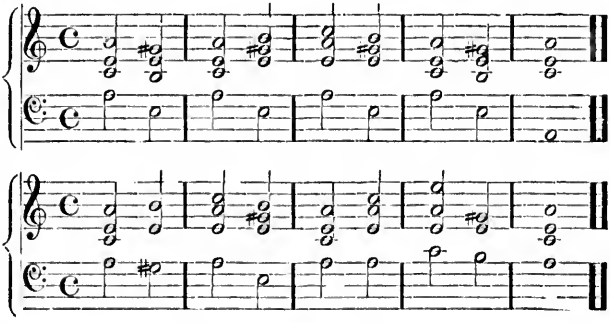


In the *minor* scale, the principal triads are placed on the same notes, and in the same order, as in the major; that is, on the *tonic*, *dominant*, *subdominant*, and *supertonic*. In the key of A minor, the *relative* to C major, these triads are—

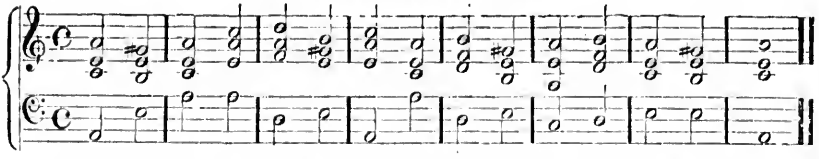


Here, it will be observed, the *tonic* and *subdominant* are *minor* triads. The *dominant* is a *major* triad, and *supertonic* an *imperfect* triad. The following examples will show how they are employed:—

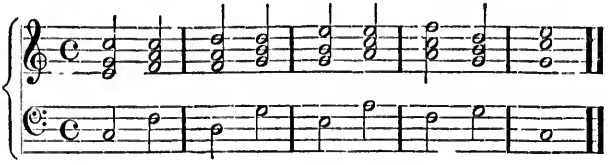
Alternations between the tonic and dominant, in different *positions* and *inversions*—



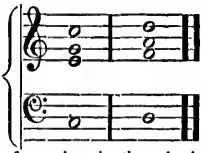
Alternations between the four triads—



In forming progressions of chords, several considerations must be attended to. A chord must be regarded as a harmonious combination of notes sounded at the same time by several voices or instruments; and a series of chords must be regarded as a succession of notes sounded by several performers and forming several different parts or melodies, heard at the same time. Care, therefore, should be taken that the notes of each part follow each other smoothly, as in the examples already given. It will be observed, in general, that the bass moves by larger intervals than the upper parts of the chord. The following is an example of the smoothest form in which a progression of triads can be arranged:—

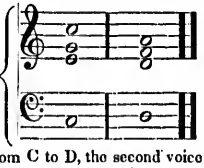


It is not permitted to make any two parts ascend or descend together by *consecutive fifths*, or *consecutive octaves*.



Take, for instance, the progression from the tonic to the supertonic—

Suppose these notes sung by four voices, in the order in which they stand. While the bass sings C, D, the second voice will sing G, A, each note being a fifth (or octave of the fifth, which is the same thing) higher than the notes in the bass; and the highest voice will sing C, D, each note being an octave above the bass. But both of these are prohibited, and may be avoided thus—



Here, while the bass rises from C to D, the second voice falls from G to F, and the highest voice falls from C to A. The progression of the triads is the same, with a different motion of the parts. This motion, when one part rises while the other descends, is called *contrary motion*. When both parts rise or fall, the motion is called *similar*; when one part rises or falls while the other part is stationary (that is, repeats or continues the same note), the motion is said to be *oblique*.

It is not easy to explain why two-fifths, heard consecutively in similar motion, should produce a bad effect, seeing that the fifth is, next to the octave, the most perfect consonance. But the fact is sufficiently ascertained by experience. The prohibition of two octaves in succession is of a different kind. They are not offensive in themselves, and are prohibited only when they would produce a poor and meagre harmony; for a note and its octave being considered as the same, if two parts move in octaves, one of them is, in respect to fulness of harmony, thrown away. There is, consequently, no harm in making two parts move in octaves when the harmony is otherwise as full as is requisite. A whole strain of music may be performed in octaves (as when a man and a woman sing together apparently the same notes); but this is not regarded as harmony at all, in the technical sense of the term.

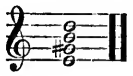
CHORDS OF THE SEVENTH.

Besides the chords called *triads*, or *common chords*, there is another class of chords, called *chords of the seventh*. From these two classes, every chord used in harmony is derived.

The principal *chord of the seventh* is formed on the dominant, or fifth note of the scale. It is formed by adding a minor seventh to the major triad on the note—

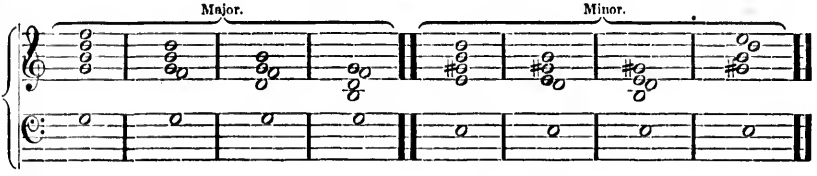
Dominant of C major.

Dominant of A minor.



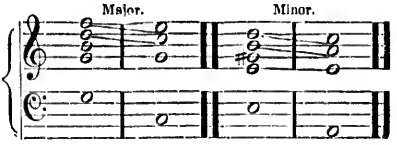
This chord may be taken in four *positions*—

Major. Minor.



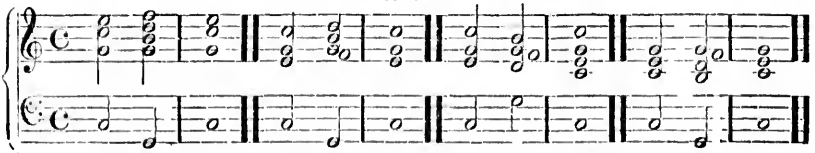
The dominant seventh is generally followed by the tonic. The dissonant note (the seventh) is *resolved* by falling a semitone, into the *third* of the tonic, and the third of the dominant chord rises one semitone into the tonic—

Major. Minor.

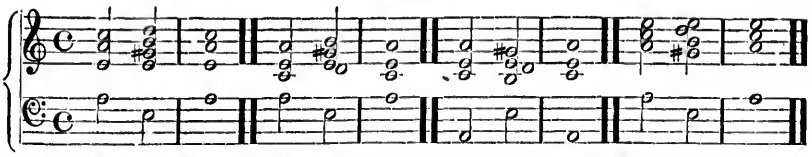


Alternations between the dominant seventh, its four *positions*, and the tonic—

Major.

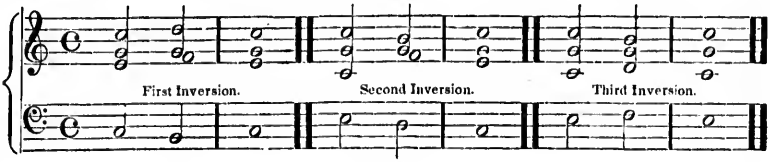


MINOR.

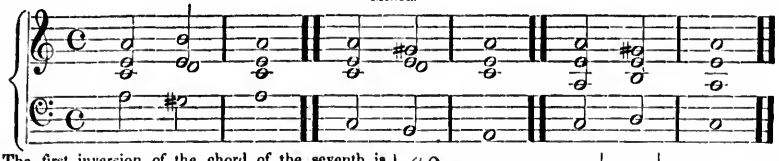


The dominant seventh admits of three *inversions*, formed by placing the different notes of the chord in the bass They are as follow, alternating with the tonic:—

MAJOR.



MINOR.

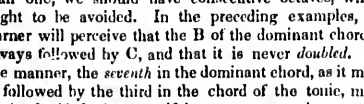


The first inversion of the chord of the seventh is called the chord of the *sixth* and *fifth;* the second inversion is called the chord of the sixth, fourth, and third (or, for shortness, *six-four-three*); the third inversion is called the chord of the sixth, fourth, and second (or, *six-four-two*). These names will be evident from looking at the chords.

In passing from the chord of the dominant to the chord of the tonic, the third in the dominant chord, which is the major seventh, or *leading-note*, of the scale, must ascend by a semitone into the key-note. Thus, in the key of C, the note B, in the chord of the dominant, must always be followed in the same part by C, the key-note, in whatever manner the chords may be inverted. Further, the third in the dominant chord ought not to be *doubled*, or sounded in more than one part; because, as this note must be followed by the key-note, if this were done in more parts than one, we should have consecutive octaves, which ought to be avoided. In the preceding examples, the learner will perceive that the B of the dominant chord is always followed by C, and that it is never *doubled*. In like manner, the *seventh* in the dominant chord, as it must be followed by the third in the chord of the tonic, must not be doubled; because, if it were, consecutive octaves would likewise be produced.

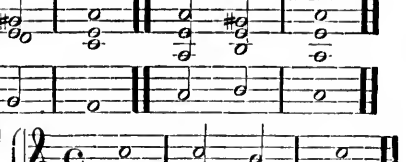
Another chord of the seventh, next in importance to the dominant, is formed upon the second note of the scale, or supertonic.

Supertonic of C major. Supertonic of A minor.



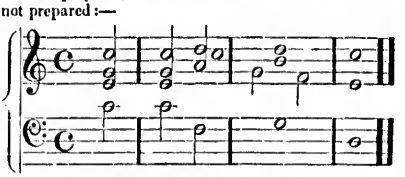
This chord may be taken in four *positions*, and admits of three inversions, analogous to those of the dominant. The learner will write it in these different forms.

In the chord of the seventh on the *dominant*, the seventh, which is the discord, must be *resolved*, as already mentioned. In the chord of the seventh on the supertonic (and in every other chord of the seventh), the seventh must be not only resolved, but prepared; that is, this note must be heard, as a consonance, in the preceding chord—

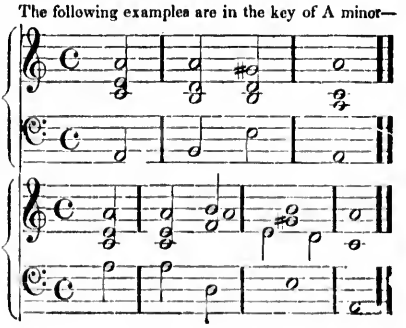


Here the C, which is the seventh of the supertonic, is *prepared* by being heard as the octave in the preceding chord, and *resolved* by falling to B in the following chord. The F, which is the seventh of the dominant, is also, in this case, both prepared and resolved. But the seventh of the dominant is not *necessarily* prepared; as may be seen by the examples already given, where it is resolved, though not prepared.

In the following example, the seventh of the supertonic is prepared, while the seventh of the dominant is not prepared:—



The following examples are in the key of A minor—



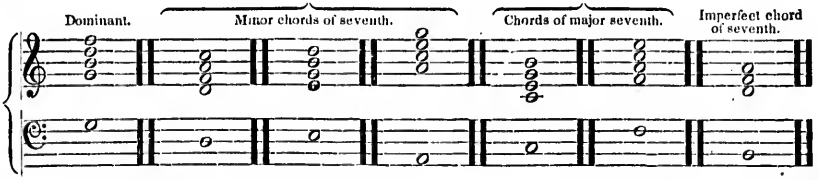
These two chords (the dominant and supertonic) are the principal chords of the seventh; but chords of the seventh (like triads) can be formed on every note of the scale. They are of four kinds; namely,

The *chord of the dominant seventh*, on the fifth note of the key consisting of a *major* third, a fifth, and a minor seventh.

The *minor chord of the seventh*, on the supertonic, the third and the sixth notes of the key; consisting of a *minor* third, a fifth, and a minor seventh.

The *chord of the major seventh*, on the tonic and subdominant; consisting of a major third, a fifth, and a *major* seventh.

The *imperfect chord of the seventh*, on the seventh note of the scale; consisting of a minor third, an *imperfect* fifth, and a minor seventh.



Of these chords of the seventh, the *dominant* (as already mentioned) is the most frequently used. Next in frequency are the minor chords of the seventh, namely, the chords on the supertonic, the third, and the sixth. More rarely used are the chords of the major seventh, on the tonic and the fourth; and, most seldom of all, the imperfect chord of the seventh, on the seventh.

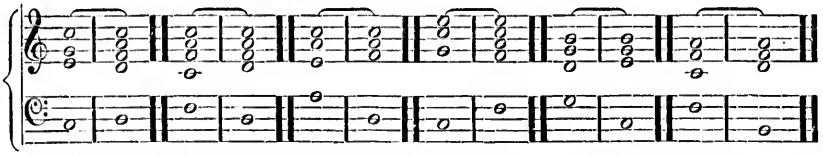
In *every* chord of the seventh, the dissonant note must be *resolved* by descending one degree. In every chord of the seventh (*excepting the dominant*), the dissonant note must also be prepared, by being heard as a consonance in the previous chord.

In order that these conditions may be complied with, the fundamental note of every chord of the seventh must descend by a fifth (or rise by a fourth) to the fundamental note of the following chord.

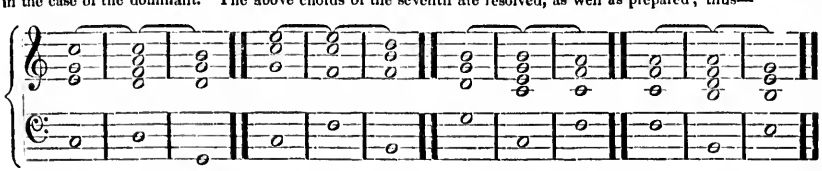
Thus, the chord of the *dominant must* be followed by the chord of the *tonic;* of which progression examples have already been given. It is not necessary, however (as has also been already shown), that the fundamental note of the chord shall stand in the lowest position. By *inversion*, any of its notes may be placed undermost but, whatever be the inversion, the fundamental progression is considered the same.

In regard to the other chords of the seventh, the fundamental progression to the chord must be such, that the note which forms the *seventh* in the second chord shall be a third, fifth, or octave, in the first. In other words, the dissonant note in the second chord must be previously heard as a consonant note in the preceding chord. This is called *preparing* the dissonance.

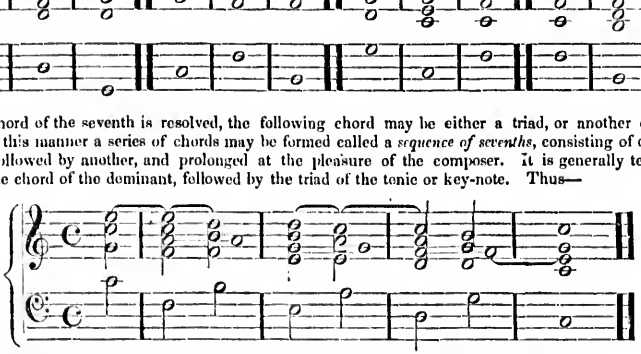
The following are *preparations* of various chords of the seventh:—



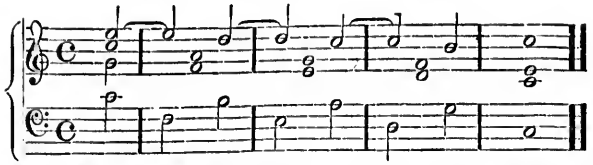
Every chord of the seventh must be *resolved*, by its fundamental note falling a fifth or rising a fourth, as shown in the case of the dominant. The above chords of the seventh are resolved, as well as prepared; thus—



When a chord of the seventh is resolved, the following chord may be either a triad, or another chord of the seventh. In this manner a series of chords may be formed called a *sequence of sevenths*, consisting of one chord of the seventh followed by another, and prolonged at the pleasure of the composer. It is generally terminated by arriving at the chord of the dominant, followed by the triad of the tonic or key-note. Thus—



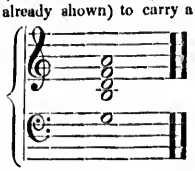
The above series commences with the triad in the key of C, and ends with the same triad, preceded by the chord of the dominant. The intermediate chords are all chords of the seventh, in which the dissonant note (the seventh) is first *prepared* by being heard as a consonance in the preceding chord, and is then *resolved* by falling a single degree. The preceding passage is more elegantly written thus—



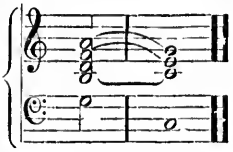
It must be observed that, in passages of this kind, the chords are not usually inverted, as their effect depends on the fundamental notes being distinctly heard in the bass.

CHORDS DERIVED FROM THE DOMINANT.

That most important note, the *dominant*, may not only be made (as has been already shown) to carry a triad, or a chord of the seventh, but also several secondary chords derived from the above.

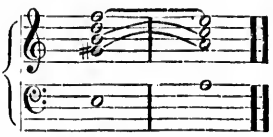


By adding the *ninth* to the chord of the seventh, on the dominant, we have the chord of the *ninth* and *seventh*—



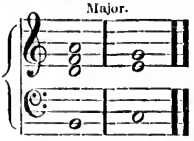
This chord must be followed by the triad of the tonic; and as it contains two dissonant notes, both of them must be resolved by descending into the notes of the following chord:—

In the relative minor key, this chord of the ninth and seventh will be resolved thus:

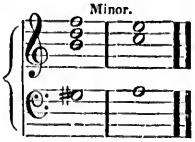


This chord of the ninth and seventh is frequently used *without* its lowest or fundamental note. It then assumes the appearance of a chord of the seventh, on the seventh note of the scale. But in this case, it is treated as if the fundamental note were understood and will be resolved into the chord of the tonic—

Major.



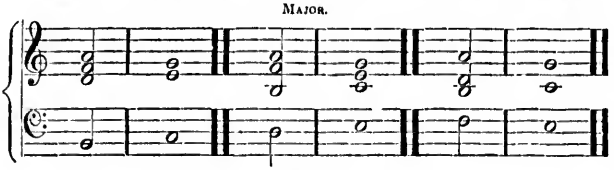
Minor.



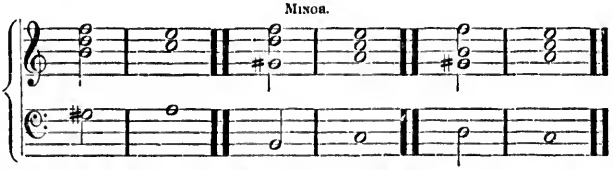
The above chord, when minor, is called the chord of *the diminished seventh*, as it has the appearance of a chord of the dominant, in which the interval of the seventh has been diminished by raising the lowest note a semitone

These two chords may be *inverted* by placing any of their notes in the bass—

MAJOR.

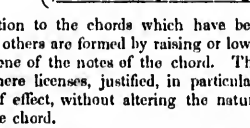


MINOR.

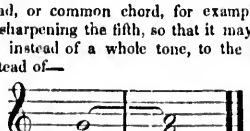


In addition to the chords which have been already explained, others are formed by raising or lowering, by a semitone, one of the notes of the chord. Those alterations are mere licenses, justified, in particular cases, by elegance of effect, without altering the nature or treatment of the chord.

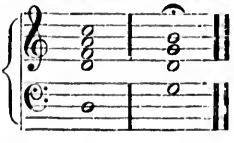
The triad, or common chord, for example, may be altered by sharpening the fifth, so that it may ascend by a semitone instead of a whole tone, to the subsequent note. Instead of—



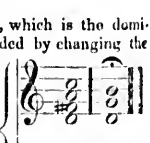
we may have



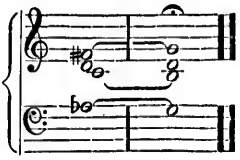
The most important of these altered chords, is that which is called *the extreme sharp sixth*. It is derived from the chord of the dominant. Suppose we have the following phrase, in the key of C:—



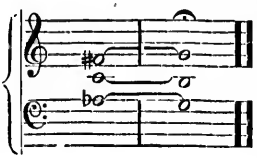
The close or stop on the last chord, which is the dominant triad, may be made more decided by changing the preceding chord, which is the minor chord of the seventh on the second note of the scale of C, into the chord of the dominant seventh on the fifth note of the scale of G, and resolving it into the triad of G, considered as a new tonic—



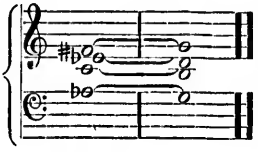
Take this chord in its *second* inversion, and then *flatten* the lowest note, so that it may fall by a *semitone* to the note following; and we have—



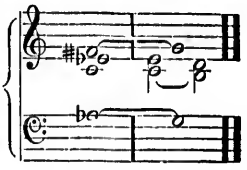
But as this chord, containing a *sharp fourth*, as well as an extreme sharp sixth, is too harsh, the sharp fourth is left out, and it is taken thus—



Or, instead of the sharp fourth, the perfect fifth is inserted—



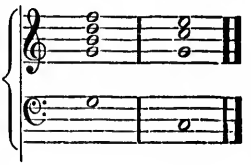
There are here *consecutive fifths*; as, while in the bass A flat descends to G, in the second part E flat descends to D. In this case, the consecutive fifths have no bad effect, and are admitted by the best composers; though others, more scrupulous, avoid them thus—



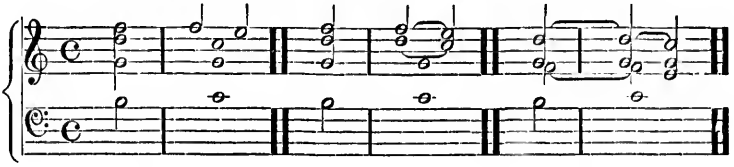
SUSPENSIONS, &c.

The chords already described are all the *real* or *essential* chords used in harmony. But great varieties of harmony may be produced by blending the notes of one chord with those of another. If, after passing from one chord to another, one or more notes of the first chord are prolonged, so as to be heard at the same time with the notes of the second chord, this is called a *suspension*.

Take, for instance, the common progression from the dominant to the tonic—



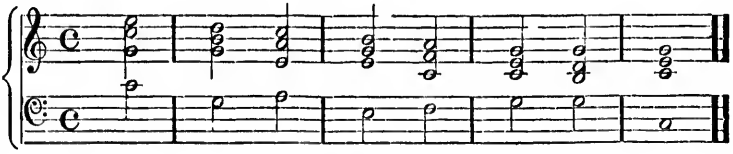
The notes peculiar to the dominant may be prolonged into the tonic, thus—



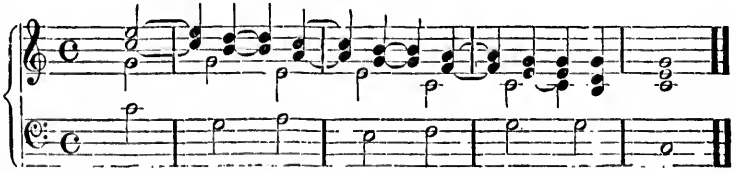
The notes thus prolonged or suspended become *dissonances* when they are heard in the second chord; but they are rendered agreeable by being *prepared* and *resolved*. This is perfectly plain, from inspecting the preceding example.

Suspensions may be formed upon any of the progressions from one chord to another which have been already explained. To give examples of these in all their variety, within our limits, is impossible; but the following specimen will give the learner an idea of the manner in which they are used. Let him compare the following progression of chords, without suspensions, with the same progression in which suspensions are introduced:—

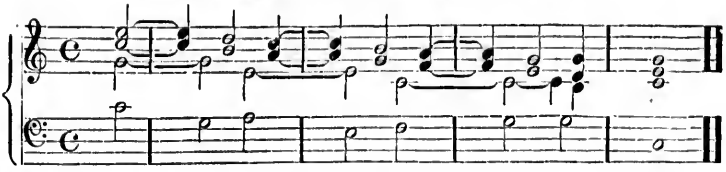
Without suspensions—



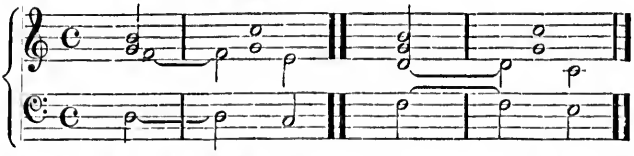
With suspensions—



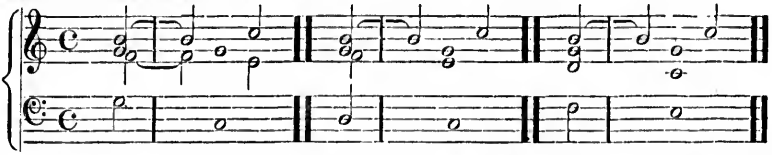
Such passages are usually written more elegantly, thus—



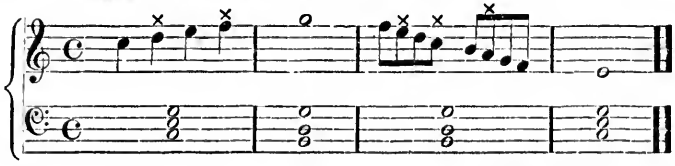
The suspension may be placed in any part of the chord, either upper or under, the suspended note being **always** prepared and resolved. For example, in the bass—



Suspensions are sometimes, but rarely, resolved by *ascending*. This generally happens when the seventh, or leading note of the scale, rises to the key-note—

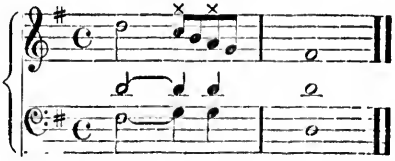


Passing notes are notes introduced to give a melodious smoothness to the passage from one chord to another, and which, though not belonging to the chord, are yet harmonious to the ear. For example—

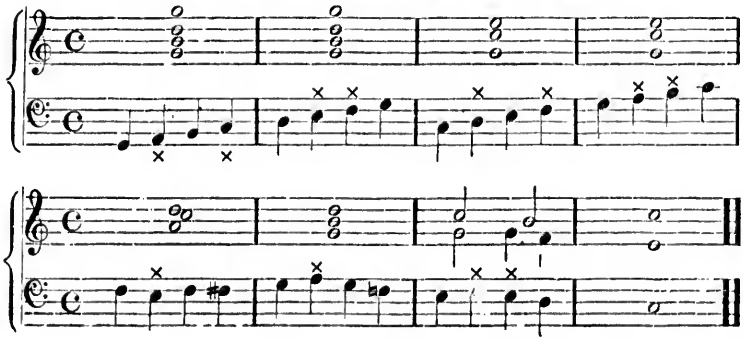


Here the notes marked with a cross do not belong to the chords, but serve as connecting links to those which do belong to them.

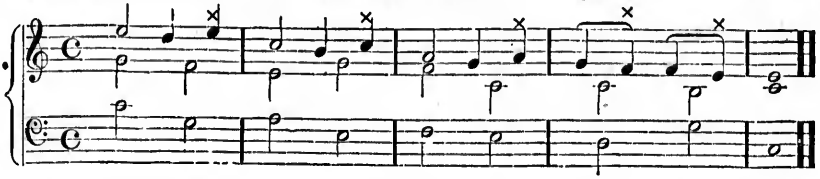
The passing notes are generally unaccented notes, though sometimes they are *accented*; as—



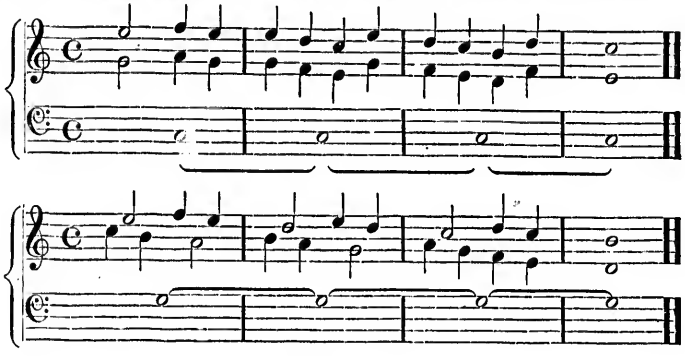
The following is an example of passing notes placed in the bass:—



Anticipation is another mode of introducing notes not belonging to the chords. It is done by anticipating a note by sounding it before the chord to which it belongs is struck, as in the following passage;—



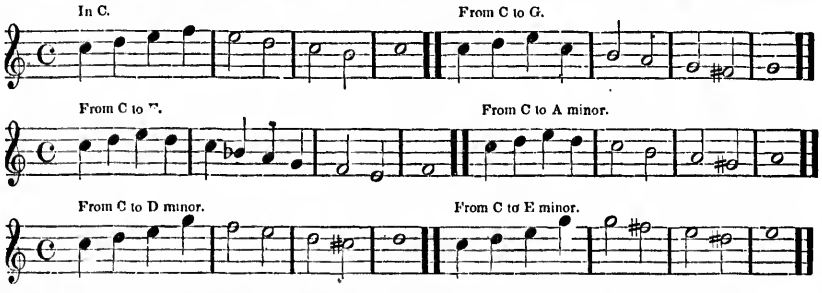
Lastly, harmony by notes not belonging to the chords may be produced by *pedal notes*. A pedal note (so called from its being generally played on the organ by the *pedals*), is a note in the bass, held on for several bars, while a series of different chords is heard along with it. It is chiefly used in the tonic or the dominant—



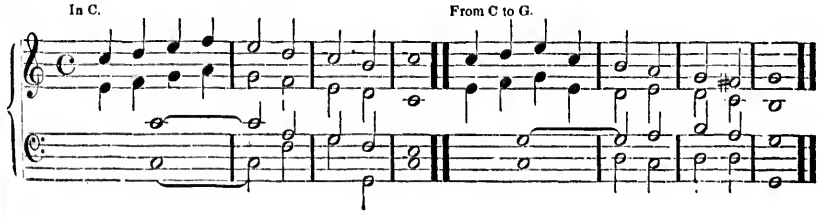
MODULATION.

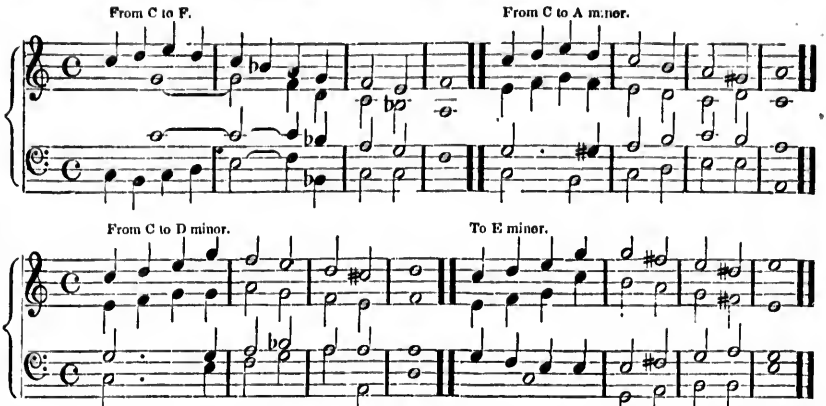
Modulation is the art of passing from one key to another. A short tune, or melody, generally remains in one key; but in more extended works, it is necessary, for the sake of variety, to diverge into different keys, according to the character and style of the composition. The field of modulation is of almost boundless extent and inexhaustible fertility in musical resources; but their use requires much skill and judgment, and is regulated by certain laws and principles indispensable for the preservation of unity and consistency.

The following simple phrases, all commencing in the key of C, show how a melody may pass into other keys.

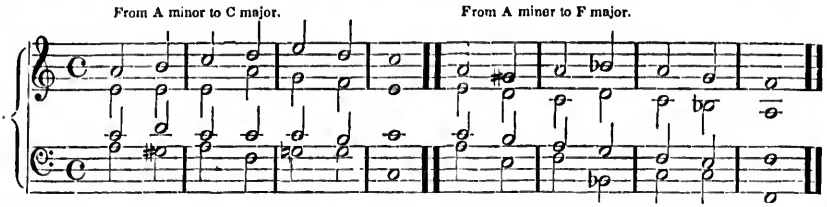


The foregoing examples may show how a melody may pass from one key to another. By harmonizing them, we see how the chords of one key pass to those of another. It will be observed that the chord of the new key is always preceded by the chord of its *dominant*—





The above are the keys into which we can pass most easily from the key of C major. If the original key is A minor, the keys into which we can pass most easily are, C major, E minor, G major, D minor, and F major—

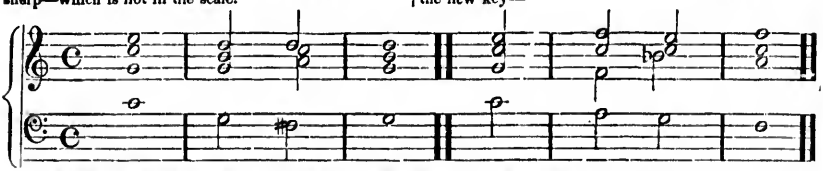


The learner may exercise himself in making transitions from A minor to the other keys above mentioned.

In modulating from the key of C to the key of any other note of the scale, the new key will be major or minor, according as the third in the scale of the new fundamental note is major or minor. Thus, the keys of F and of G (as well as C) are major; while the keys of D, E, and A, are minor. We do not mention the key of B, as this key, in modulating from the key of C, is very rarely used. This note, besides having a minor third, has an *imperfect* fifth, F natural; and, to make it the fundamental note of a key, whether major or minor, its fifths must be made *perfect*, by changing F to F sharp—which is not in the scale.

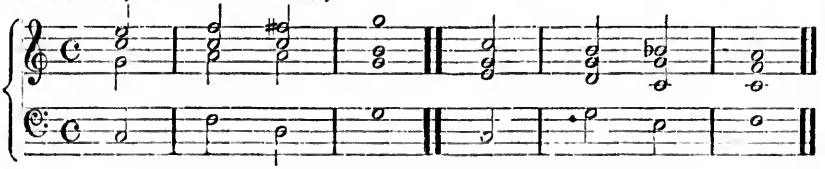
In the above examples of transitions from C major, or A minor, to other keys, these notes must be understood as standing for *any* major or minor key, from which transitions may be made in the same manner. Thus, taking G as the original major key, transitions may be made to D and C major, and to A, B, and E minor; and, taking E as the original minor key, transitions may be made to G major, B minor, D major, A minor, and C major. The learner should exercise himself in writing similar modulations in all the different keys.

The smoothest and most gradual modulation is effected by means of a chord which is common to both keys that is, which belongs both to the original key and to the new key—



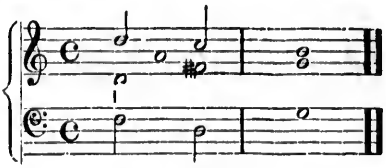
In the first of these examples, the first triad of G belongs both to the original key of C and to the new key of G. In the second example, the triad of F (of which A is the bass) belongs both to the original key of C and to the new key of F.

Modulation is less gradual (though it may be perfectly admissible), although the chord which immediately precedes the new key is not common to both keys—

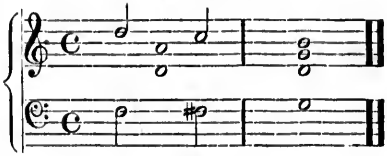


In the first example, the triad of F belongs to the original key of C, but not to the new key of G. In the second example, the triad of G belongs to the original key of C, but not to the new key of F. This kind of modulation generally produces a *chromatic* melody, or a melody containing an *accidental* semitone in one of the parts; as from F to F sharp, or from B to B flat, as above.

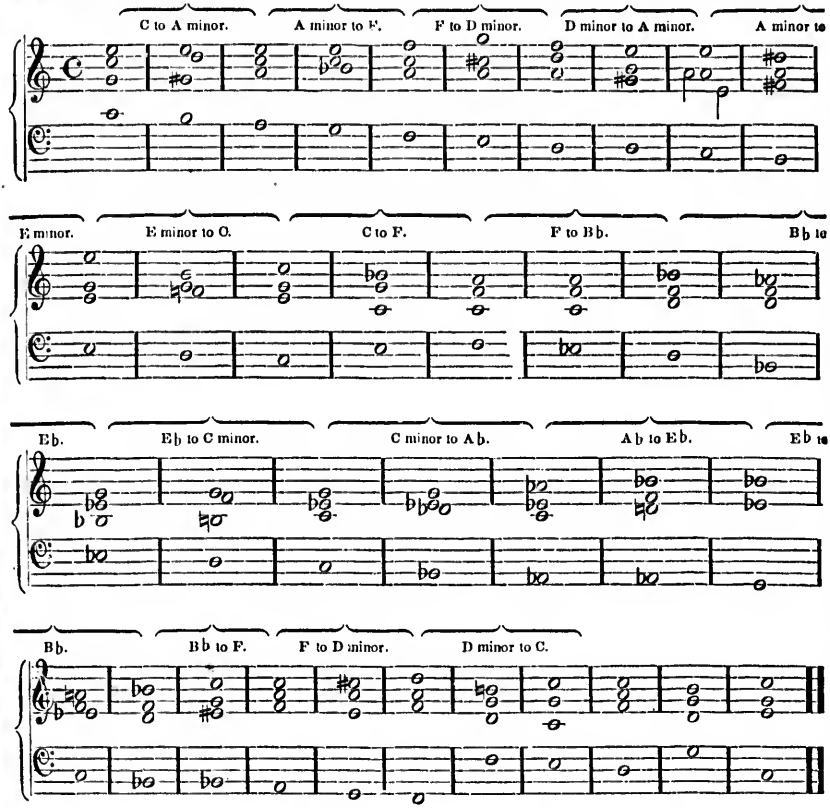
When a chord is succeeded by another, in such a manner that one of the notes of the first chord appears in the second chord, altered by a sharp or a flat, the note must be followed by its alteration *in the same part*, so as to make a chromatic melody, as in the preceding examples. When the note of the first chord appears in one part, and the altered note of the second chord appears in another part, this produces a fault, called a *false relation;* as, for example—



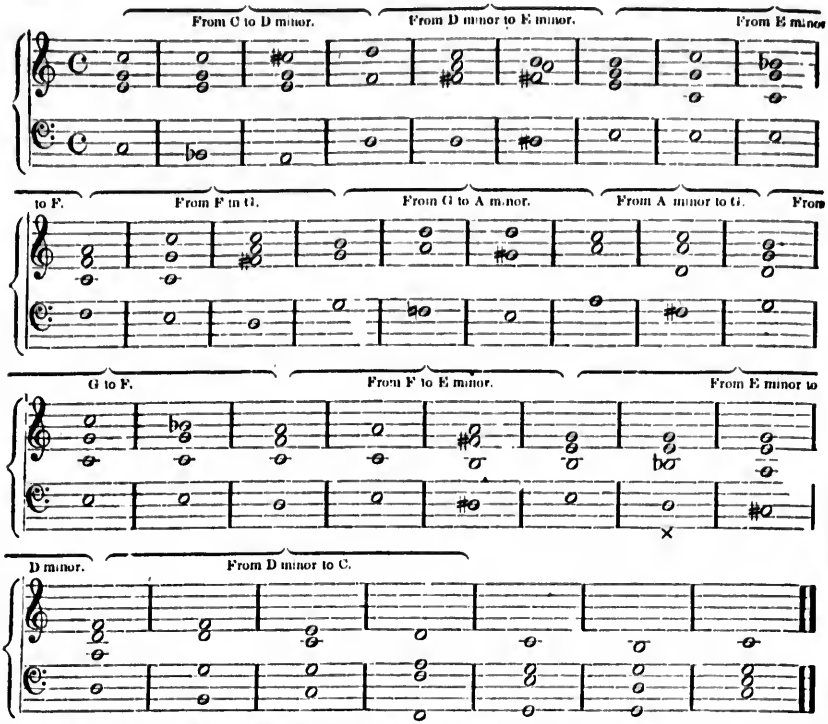
To be avoided thus—



The following example is a chain of modulations, in which every key is *relative* to that which precedes it. All the modulations are effected by an intermediate chord, which is the dominant seventh, generally employed in one of its inversions—



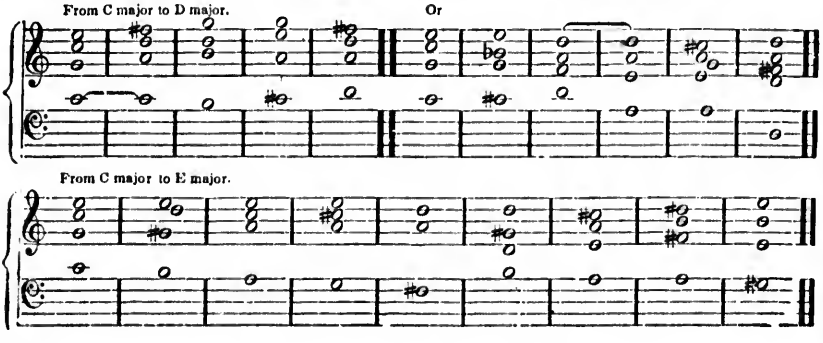
We may modulate into a key which is not relative to that which precedes it (or its antecedent), provided that both keys are relative to the primitive key or the principal key which predominates in the piece of music. Thus, when the principal key is C, we may modulate from D minor to E minor; because, though these keys are not relative to each other they are relative to the key of C. Supposing the primitive key to be any note, we may modulate immediately from its second to its third, from its third to its fourth, from its fourth to its fifth, from its fifth to its sixth, and from its second to its fifth, and *vice versa;* these modulations will be generally effected by means of two intermediate chords, as in this example—



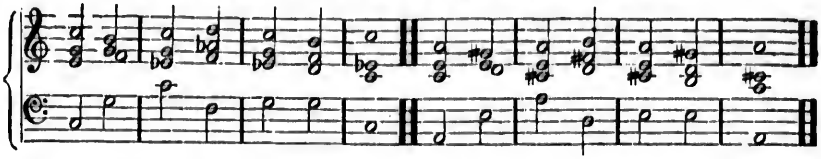
Observe that the D in the bass, marked with a cross, does not belong to the harmony of the chord, but must be regarded as a passing note, leading from the bass-note of the preceding to that of the following chord.

In modulating in this way from a key to another which is not relative to it (as from F to G, or from E to F), we must take care that the *primitive* key, to which both the keys are relative (though not relative to each other), be well determined; for it is only when this precaution is taken, that such modulations can be properly employed. We can easily modulate from G major to F major, by means of two intermediate chords, in a piece of music of which the principal key is C major, while we could not do so if the principal key were D or E minor. What is good in the one case might be bad in another; and all the above-mentioned modulations—from the second note of the scale to the third, from the third to the fourth, &c. —can only be used under the above condition.

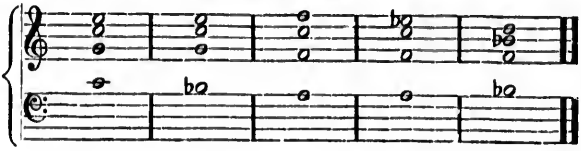
When the primitive key is minor, in like manner, we may modulate from the fourth note of the scale to the fifth, from the fifth to the sixth, from the sixth to the seventh, from the fourth to the seventh, and *vice versa*. The learner may exercise himself in finding examples of this rule, similar to those given above. In the above modulations into the keys of different notes of the scale, the keys are major or minor according as their thirds, as they stand in the scale, are major or minor, as already shown; as we modulate from C to D minor, E minor, &c. We may also, though more seldom, modulate from C to D major, E major, &c.; but this must be done by a longer chain of intermediate chords, so as to prepare the ear gradually for the transition. For example—



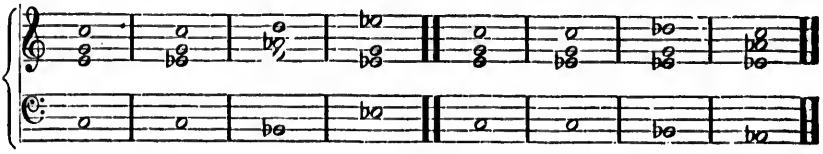
We may pass from a major to a minor key on the same note, and *vice versa*—



We may likewise modulate from a given key to notes which are not in the scale of that key; as, for example, from C to E flat, B flat, A flat, &c. These modulations ought to be gradually effected, by passing into some intermediate key, which is relative to the keys which precede and follow it. Thus, in order to modulate from C to B flat, we may pass first from C to F, and then from F to B flat—



In order to modulate from C to E flat major, we may pass first from C major to C minor, and then from C minor to E flat; and to modulate from C to A flat major, we may pass from C major to C minor, and thence to A flat—

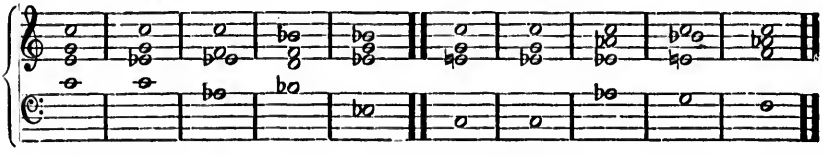


It may be laid down as a general rule, that, as we may pass from a major key to a minor key on the same note (as from C major to C minor), or from a major key to the minor key of its subdominant (as from C major to F minor), we may pass from a major key to all the keys which are relative to these two other keys. Thus from C major we may pass to all the relative keys of C minor, or to all the relative keys of F minor.

Modulations from C major to the relative keys of C minor—

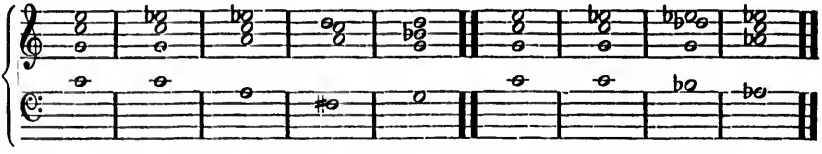
From C to E flat.

From C to F minor.



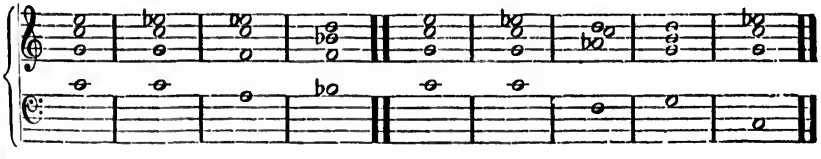
From C to G minor.

From C to A flat.

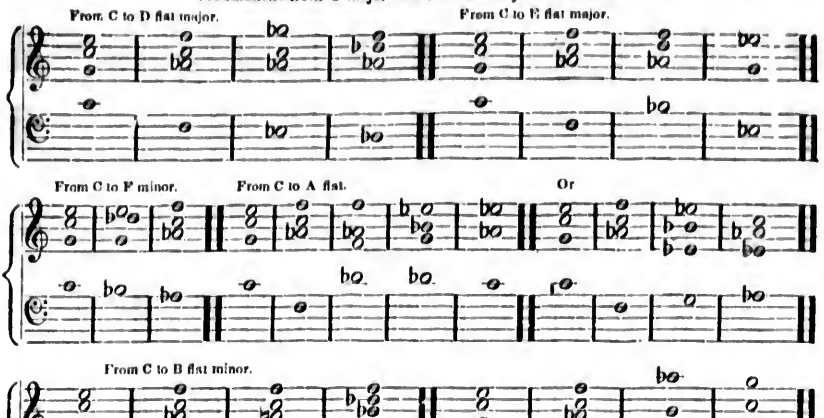


From C to B flat.

From C major to C minor.



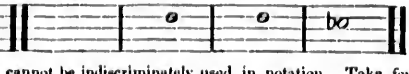
Modulations from C major to the relative keys of F minor—



The above rules and examples embrace the principal varieties of gradual, or regular modulation. But composers, in order to produce uncommon or striking effects, make *abrupt* or *irregular* transitions, by passing from one key to another not related to it (as, from C to B flat, or E flat, or D major, &c.), without the intervention of any intermediate chord. In such cases, the abruptness of the transition is frequently softened by making a pause before striking the chord of the new key; or the same effect is sometimes produced by sustaining a single note, without any harmony, for a little time, and striking a new chord containing this note in its harmony. But the use of the sudden and abrupt transitions cannot be reduced to any rule; it must be gathered from the works of the great masters. They must be cautiously and sparingly used; as departure from rule can be justified only by the effect produced.

There is one kind of sudden modulation which, from its importance, requires especial notice. This is *Enharmonic Transition.*

The diatonic scale (as has been already explained) consists of five tones and two semitones. By dividing all the tones into semitones, we have a scale of semitones, called the *chromatic* scale. In thus dividing the tone, the intermediate sound may be regarded either as the lower extremity of the tone raised, or as its upper extremity depressed; as, the intermediate note between C and D may be either C sharp or D flat. Thus, two chromatic scales are formed—a scale by sharps, and a scale by flats. The tone is not divided into two exact halves, but the difference is so minute as to be disregarded in practice; C sharp is treated as being the same sound as D flat, and on keyed instruments is produced by striking the same key. But, though the intermediate sound between C and D is regarded as the same, whether it is expressed by the name of C sharp or of D flat, yet these names cannot be indiscriminately used in notation. Take, for instance, the chord E, G, B flat, D flat; and then take the chord E, G, B flat, and C sharp. These chords are struck on the same keys of the pianoforte, yet are essentially different in their character and treatment. The chord E, G, B flat, D flat, is a chord of the diminished seventh, which requires to be resolved into the triad of F; the chord E, G, B flat, C sharp, is an *inversion* of a *different* chord of the diminished seventh (C sharp, E, G, B flat), in which the C sharp is removed from the bottom to the top of the chord; and it must be resolved into the triad of D—

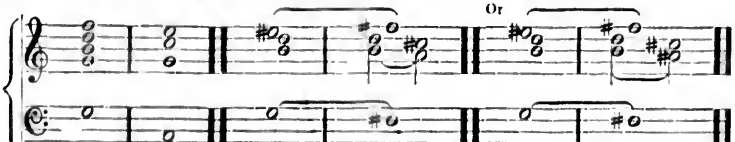


Here, then, we have the means of effecting an unexpected modulation. If, while in the key of F, we have the above chord with D flat, we may, by changing that note into C sharp (the sound remaining in the same), come at once into the key of D.

Enharmonic transitions may be made by means of three chords—the *dominant seventh*, the *extreme sharp sixth*, or the *diminished seventh.*

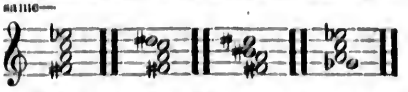
The chord of the dominant seventh may be changed into the chord of the extreme sharp sixth; and, *vice versa*, the chord of the extreme sharp sixth may be changed into the chord of the dominant seventh.

If we are in the key of C, for example, by changing the F, the dominant seventh, into E sharp, the extreme sharp sixth, we may come at once into the distant key of F sharp, either major or minor.

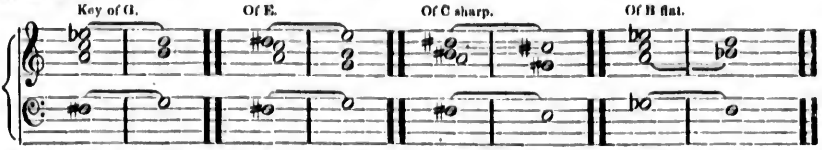


And, of course, we can reverse this progression, by changing the chord of the extreme sharp sixth into the chord of the dominant.

The chord of the diminished seventh is that whereby enharmonic transitions are most frequently made. Any chord of the diminished seventh may be written in four different ways, its sounds always remaining the same—



In the first of these, the leading note is F sharp, leading to G; in the second, the leading note is D sharp, leading to E; in the third, the leading note is B sharp, leading to C sharp; and in the fourth, the leading note is A, leading to B flat. Thus—



And, as each of these triads of G, E, C sharp, and B flat, may be either major or minor, we have here eight different keys into which we may pass from one chord.

The great facility with which many unexpected transitions may be made in this manner, is a temptation which young composers are seldom able to resist. They crowd their music with crude and disagreeable modulations, imagining that they are displaying learning and skill, while they are doing what is in reality very easy. The remarks on this subject by the celebrated Piccini, one of the greatest masters of the Italian school, ought to be kept in remembrance by every student of music—"To modulate," says this illustrious musician, "is to take a route which the ear will follow willingly. It even asks to be led; but only on condition that, when arrived at the point to which you have conducted it, it may there find something to repay it for its journey, and may enjoy some repose. If you keep it constantly going on without granting what it demands, it becomes weary, and will follow you no longer. To modulate is not difficult in itself; there is a routine for that as well as all other occupations. The proof of this is found in those *enharmonic modulations* which appear to the ignorant the height of science, and are, after all, the mere sport of learners. To create melody from a given modulation, to quit it only by legitimate means, to return to it without harshness or insipidity, to make the change of modulation a just means of expression, and of judicious variety—these are the real difficulties. But to quit a key almost as soon as we have entered it, to become extravagant without reason or end, to proceed by jumps and skips, merely because we do not know how to remain where we are—to modulate, in short, for the sake of modulating, is to prove that the artist is ignorant of the end of his art, as well as of its principles; and that he affects a superabundance of imagination and learning, in order to conceal the want of both the one and the other."

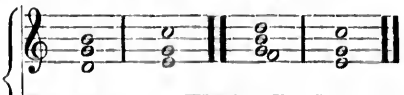
The musical instructor can explain the means by which the different kinds of modulation can be effected; but in the use of these means, the musician must be guided by the dictates of ear, taste, and feeling. It may be said, in general, that the principal key, in which the piece begins and ends, ought to occupy the largest portion of it; and that, in modulating into other keys, those which are most nearly related to the principal key may be dwelt upon at greater length than those which are more distantly related to it. But the varieties in the course of modulation are infinite; and the succession of keys, in any composition, must be the result of judgment matured by experience.

CLOSES OR CADENCES

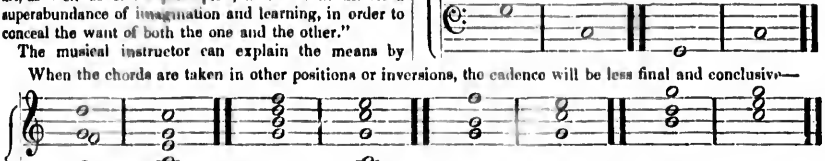
There is an analogy between music and language, in regard to *punctuation*. A strain of music is divided into periods, and these are subdivided into clauses; these periods and their subdivisions being marked by closes, or cadences, more or less complete. These closes, or cadences, are found either in melody or in harmony; but the closes of a melody are more strongly marked and defined by the harmony with which they are accompanied.

The principal cadences are those which end on the tonic, or key-note.

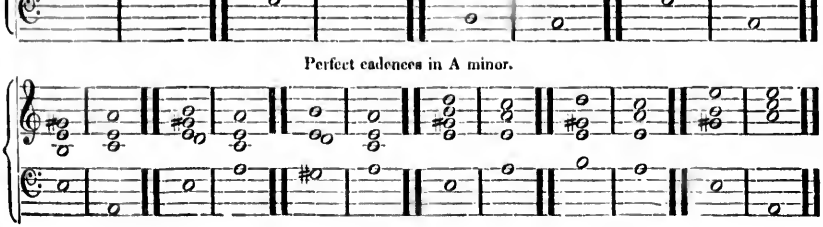
The *perfect* cadence takes place when the chord of the tonic is preceded by the chord of the dominant. Its most complete and final form is when the tonic itself is the last note of the melody, and when the fundamental notes of the chords are placed in the bass. The dominant may be either a triad, or a chord of the seventh—



When the chords are taken in other positions or inversions, the cadence will be less final and conclusive—

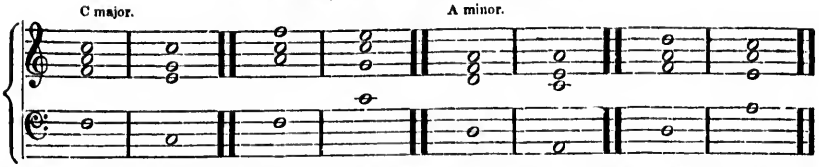


Perfect cadences in A minor.



The tonic may be preceded by the subdominant—

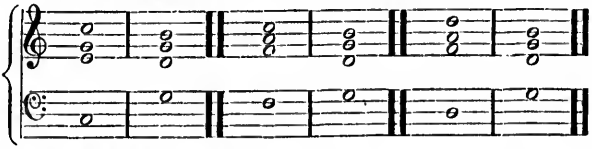
C major. A minor.



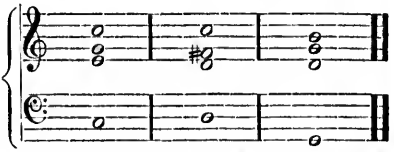
This cadence, from the subdominant to the tonic, is not used as a final close, except occasionally in old ecclesiastical music.

In the final cadence, from the dominant to the tonic, the seventh note of the scale (or leading note) must always be heard in one of the parts, and followed by the key-note. In minor keys (as well as major), this seventh or leading note, must always be the major third of the dominant chord, and must ascend to the tonic by a semitone.

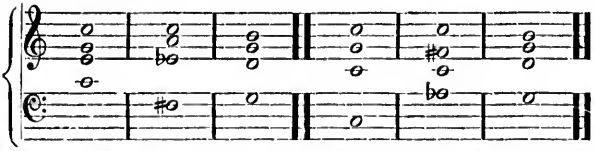
The next class of cadences are those which end on the *dominant*, and are called *imperfect*. The dominant may be preceded by various chords—most frequently by the tonic; but also by the subdominant, or the supertonic—



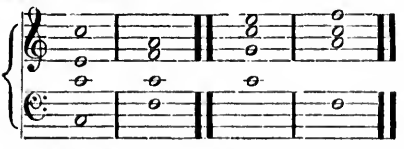
These closes on the dominant are never final; something else is always expected to follow them. A close on the dominant may be rendered more determined by making the preceding chord a dominant, and thus rendering the closing chord a temporary tonic. This is a transient modulation into the key of the dominant of the original key. In the key of C, the chord of D, the supertonic, will be converted into the dominant of the key of G—



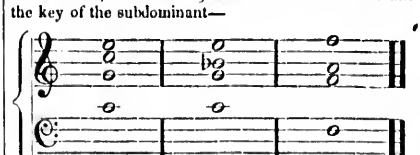
Or the chord preceding the close may be one of the chords derived from the dominant; the chord of the *diminished seventh*, or the chord of the *extreme sharp sixth*—



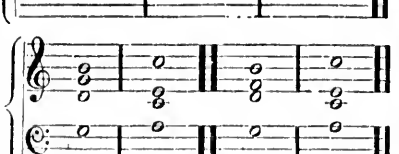
A cadence may take place by passing from the tonic to the *subdominant*—



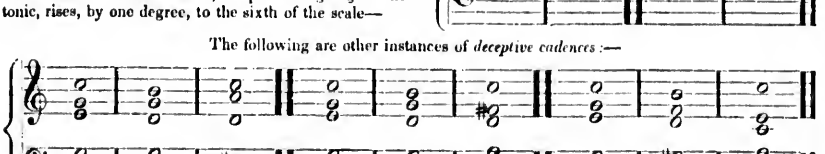
This may be made more decided by converting the tonic into a temporary dominant, by adding the minor seventh to its chord; thus making a transient modulation into the key of the subdominant—



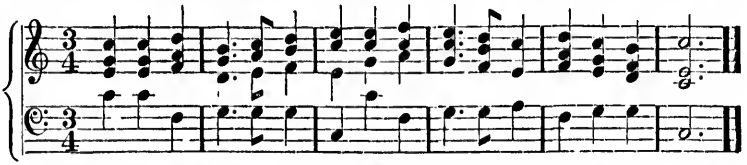
When we expect a perfect cadence from the dominant to the tonic, the ear may be disappointed or deceived, by passing from the dominant to some chord different from the tonic. The most common of these is the *interrupted cadence*, in which the fundamental note of the dominant chord, in place of going to the tonic, rises, by one degree, to the sixth of the scale—



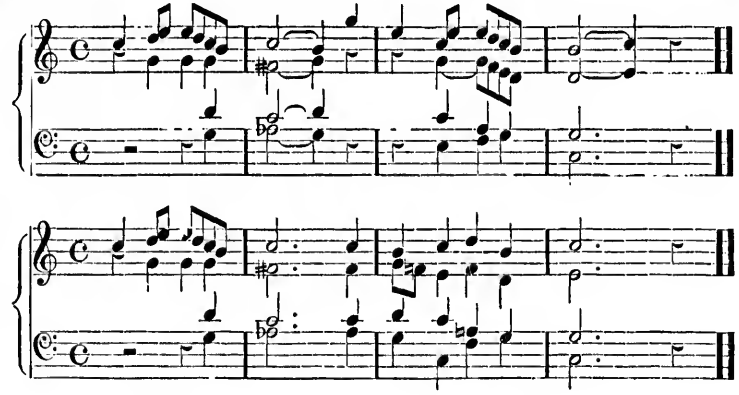
The following are other instances of *deceptive cadences*:—



The use of such cadences is to prevent the strain from coming to a final close, by disappointing the ear of the expected termination, and leading it to expect something more. This is well exemplified in the national air of "God save the Queen." The first part consists of six bars; at the end of the fourth, the melody comes to a close upon the key-note; but, in the bass, this close is *interrupted* by rising from the dominant to the sixth—



The following examples also show how, by such means, variety may be given to the repetition of the same notes in a simple melody :—



COUNTERPOINT.

Counterpoint is the art of composition in two or more vocal or instrumental parts, in such a manner as to render each separate part smooth and melodious, and at the same time to combine them in the purest harmony. This art is to a great extent deduced from the principles of harmony already explained; but, in its practice, various considerations and rules must be attended to, in order to prevent the music from being harsh, and unnecessarily difficult of execution. Many persons can heap together full chords on the organ or pianoforte, who cannot write, with purity and elegance, a simple duet for two voices.

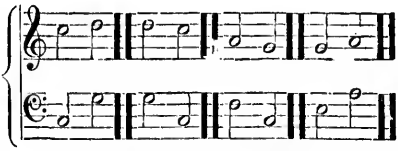
The rules of counterpoint depend, in some measure, on the number of voices or instruments for which music is written. The fewer the parts, the stricter are the rules applicable to them. In two parts, things are prohibited which are admitted in three or four. We shall, therefore, give the principal rules of counterpoint, as applicable to composition in two parts; and shall afterwards show how they may be relaxed when the parts are more numerous.

Counterpoints in two parts.

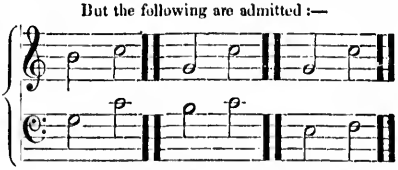
Two fifths, or two octaves, are not to be used in succession. This rule, which has been already explained, is of rigorous application in this species of counterpoint.

It is improper to proceed to a *perfect concord* by *similar motion*, except when one of the parts proceeds by a semitone. It is necessary to explain, that the octave and the fifth are called *perfect concords*, and the third and the sixth *imperfect concords*.

It is wrong, therefore, in two parts, to use such progressions as these—



But the following are admitted :—

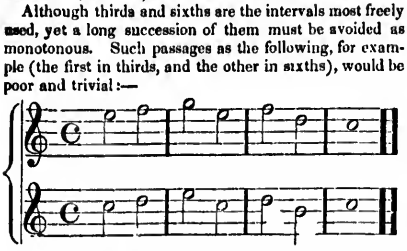


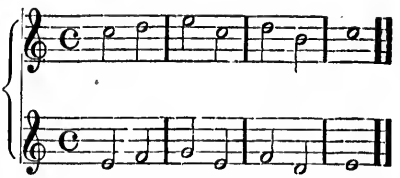
In the melody of each part, considered separately, the intervals ought, as much as possible, to be smooth and easily taken by the voice. This is a rule more of taste than of grammar, and the strictness of its application must depend on the nature of the composition. The ancient masters, who wrote for voices unaccompanied by instruments, did not admit into their melodies the intervals of the sharp fourth, the diminished fifth, nor the seventh. But in modern music, where the voices are supported by instruments, all these intervals are admitted. The *principle* of the rule, however, ought never to be lost sight of, especially in vocal music.

In considering the two parts together, the same principle should be observed in regard to the intervals of harmony. The intervals most freely used are the *major and minor third*, and *major and minor sixth*. The *unison* and *octave* are used seldom, as their frequent use would render the harmony meagre; their use is therefore chiefly con-

fined to the beginning and end of a passage. The *fifth* is used more frequently than the unison and octave, but by no means so freely. The *fourth* must be used sparingly, and generally with the precaution of being prepared and resolved; and the same thing is the case with the second, seventh, and other dissonant intervals.

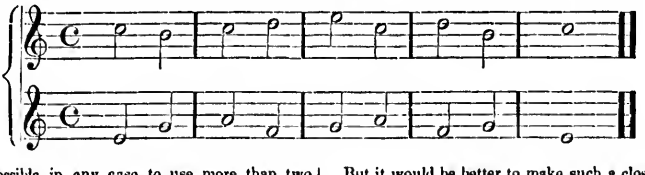
Although thirds and sixths are the intervals most freely used, yet a long succession of them must be avoided as monotonous. Such passages as the following, for example (the first in thirds, and the other in sixths), would be poor and trivial:—



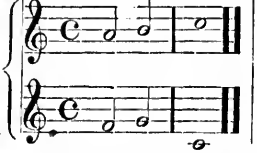


On this account, it is laid down as a rule, that no more than three thirds, or three sixths, ought to be used in immediate succession.

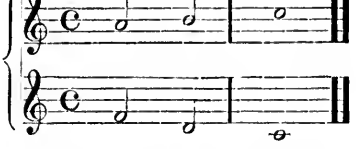
The monotony above exemplified is avoided, and an agreeable harmony produced, by using thirds and sixths so blended together as to prevent the recurrence of too many of the same kind in succession, thus—



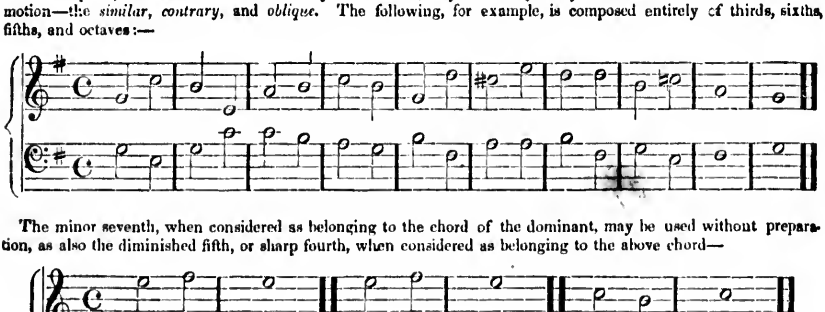
It is impossible, in any case, to use more than two major thirds in succession; and even two major thirds in succession can be tolerated only in one case, which is, when the two upper notes are the sixth and major seventh of the scale, immediately preceding a close; as—



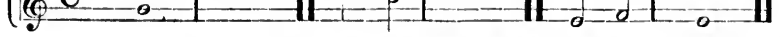
But it would be better to make such a close thus



Counterpoint, even when it consists merely of concords, may be diversified by the use of the different kinds of motion—the *similar*, *contrary*, and *oblique*. The following, for example, is composed entirely of thirds, sixths, fifths, and octaves:—



The minor seventh, when considered as belonging to the chord of the dominant, may be used without preparation, as also the diminished fifth, or sharp fourth, when considered as belonging to the above chord—



Our limited space prevents us from going further into this branch of our subject, and passing over counterpoint in more than two parts, we arrive at

IMITATION, CANON, DOUBLE COUNTERPOINT, AND FUGUE.

The preceding pages contain an exposition of the principles of harmony, which are applicable to every species of composition. It remains to point out several resources which are found essential to the production of beauty and variety; as, without a general knowledge of their nature, so as to be able to perceive them when they are used, it is impossible to comprehend and enjoy the works of the great masters.

Of these resources, the principal are *imitation*, *canon*, *double counterpoint*, and *fugue*.

Imitation is the repetition, in one part, of a phrase or passage which has already been heard in another part. The imitation may be made either in the unison or octave, or in some other interval above or below.

imitation may be made by *contrary motion;* that is, when descending intervals in the one part are imitated by ascending ones in the other, and *vice versa;* and by *retrograde motion*, when the imitation begins at the end of the imitated passage, and goes backward.

Imitations are likewise made by *augmentation:* that is, when the given passage is imitated in notes of double length; and by *diminution*, when this process is reversed. Imitation is *strict*, when the passage is precisely imitated in every interval; and *free*, when the figures of the notes are imitated, so as to produce a general resemblance, without an exact imitation of the intervals.

Canon is that species of composition in which two or more parts are heard successively, in strict imitation. Canon is based upon imitation; but imitations are introduced and abandoned at the pleasure of the composer; whereas the whole piece or movement, called a canon, must be in strict imitation. Canon being just strict imitation, it follows that there are as many kinds of canon as of imitation—in all the different intervals, by contrary and retrograde motion, by augmentation and diminution.

Canons may be in any number of parts; but they are generally in two, three, or four. When they are so constructed as to close with a perfect cadence, they are called *finite*, in opposition to those called *endless* or *perpetual*, which go on till the performers think proper to leave off.

The most admired canon extant is the famous "Non nobis Domine" of William Byrd. It is for three voices (or in three choral parts), the subject, in the first part, being imitated in the second part a fourth below, and, in the third part, an octave below.

The canon, when discreetly used by a musician of real learning and genius, is a fruitful source of beauties. But this species of composition has been grossly abused by musical pedants, in whose hands it has degenerated into a mere trick of inventing and solving riddles and conun[illegible]

[illegible] *interpoint* is that species of counterpoint which is capable of being *inverted* in such a way that the upper part may be made the under, and the under the upper, without detriment to the goodness and regularity of the harmony. This inversion may take place most easily in the octave; that is, an under part, by being raised an octave, may often be placed uppermost, even though the parts had been written without this intention. But if the inversion is made in any other interval—that is, if the under part is raised a ninth or tenth, an eleventh or a twelfth—many precautions must be taken to render the parts capable of being so inverted. Next to double counterpoint in the octave, that in the tenth, and that in the twelfth, are the most practicable and frequently used.

Fugue is the most complex and difficult branch of composition. A general explanation of its principles, however, will enable the student to understand the construction of the choruses of Handel, and the other great ecclesiastical composers, in whose works the grandest specimens of it are to be found.

Fugue consists of a *theme* or subject, given out by one part, and imitated by the others according to certain laws, and carried on with that mixture of unity and variety which these laws are calculated to produce. These laws, moreover, though derived from the practice of several centuries, are by no means arbitrary, but founded on sound principles of reason and taste. The fugue is pre-eminently calculated to express the feelings and sentiments of a great multitude; and its noblest examples are to be found in sacred music—in the oratorios of the great German masters, and the anthems of the English cathedral service.

The fugue consists of certain constituent or elementary parts. First, the *theme* or *subject*, which is a leading phrase or melody, constantly heard, in various forms or imitations, throughout the whole piece. Next, the *answer*, which is the imitation of the subject taken up by another part. The correctness of the answer depends on many considerations, which cannot here be entered into. But the great principle on which it depends is the division of the scale into two portions or phrases; the one extending from the tonic to the dominant, and the other from the dominant to the tonic; the one embracing the interval of a *fifth*, and the other the interval of a *fourth*.

POPULAR METHODS OF TEACHING SINGING AND THE ELEMENTS OF MUSIC.*

Within these few years a considerable change has taken place in the method of teaching music, but particularly vocal music, to large bodies of people. Formerly, a master was employed to teach each person individually: now, the number instructed at the same time is almost unlimited. This, however, could only be effected by a system which would enable *all* to understand what was taught; and this has been attempted by two different plans—that of Mr. Joseph Mainzer, and of Mr. Bocquillon Wilhem.† The plan of Mr. Mainzer is the most simple of the two, but this simplicity may be said to amount to meagreness; for it fails, as far as we can understand, to instruct the pupil in raising or sustaining notes without the assistance of an instrument, and conveys a less perfect knowledge of the theory of music than the other; still, it is a great advance in methods of popular instruction, and we wish it every success. The plan of Mr. Wilhem, which has received the favour of the Committee of Privy Council on Education, and is now extensively taught under the auspices of Mr. Hullah and others, amounts to a regular system of music. Wilhem's method has at least two leading peculiarities. 1st, He uses no musical instrument whatever. 2d, He makes thorough musicians of his pupils as they proceed, not teaching them merely to imitate the sounds given by the pianoforte, flute, or violin; but he teaches how far the voice is to be raised or lowered, from one sound to another, by actual measurement, if such a term may be used.

He has based his method on three great principles: 1st, That the human voice is the origin of all music, and therefore the model for every musical instrument known. Experience has proved, that if we take any given sound as a foundation, and raise our voices by degrees (to us most natural), we can produce seven distinct sounds, each different from the other, and following each other by a regular and definite succession. It is the aim of all instruments to imitate, as nearly as possible, these seven sounds. 2d, Sympathy of voices in large bodies of people. This sympathy has not yet been sufficiently explained; yet the most acceptable of many theories on this point is that of Dr. Arnott, that the vibrations caused in the atmosphere by a large number of voices has the remarkable effect of bringing all to one pitch, and what is still more interesting, that all will follow or be led by those that are correct, and never a correct voice yield to one that is wrong, but maintain its position.

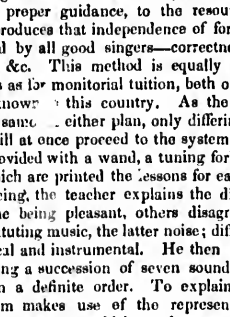
* For this section, Mr. Hogarth, the composer of the preceding pages, is not responsible. It has been appended by the Editors.

† Mr. Wilhem was a professor at the Conservatoire Musical at Paris, and died in the beginning of 1842.

3d, That the study of an art should always be arranged on the constructive or synthetic, not on the analytical method. The constructive method is understood as commencing with the most simple facts, and ascending to the general, through a series in which every step of the progress is distinctly marked, and which enables the pupil, without straining his faculties, to arrive at results which might otherwise have been difficult of attainment.

By making use of no instrument, and leaving every thing, under proper guidance, to the resources of the learner, he produces that independence of foreign aid, so much desired by all good singers—correctness of intonation, time, &c. This method is equally adapted for simultaneous as for monitorial tuition, both of which are sufficiently known in this country. As the instruction given is the same on either plan, only differing in minor details, we will at once proceed to the system itself. The teacher is provided with a wand, a tuning fork, and large sheets on which are printed the lessons for each evening. On commencing, the teacher explains the difference of sounds—some being pleasant, others disagreeable—the former constituting music, the latter noise; different kinds of music, vocal and instrumental. He then proceeds to the scale, being a succession of seven sounds, following each other in a definite order. To explain this more fully, Wilhem makes use of the representation of a ladder (*l'escalier vocal*), which renders sensible to the sight some abstract notions of the first elements of music; namely, the tones and semitones, the diatonic scale, the twelve semitones of the chromatic, the intervals formed by combinations of these tones and semitones, &c. &c.

Major Diatonic Scale.



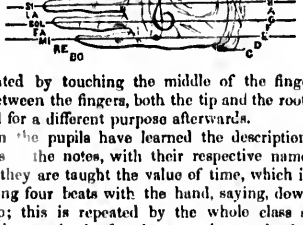
These truths in elementary music are conveyed in a manner calculated to keep the attention of the pupils constantly alive. Sometimes the teacher illustrates his meaning by singing a few notes; at another, by pointing to the large sheets, and then interrogating the pupils individually, to ascertain whether the real meaning has been clearly understood. In the representation of the ladder, there are eight bars, of which the third and fourth, and seventh and eighth, are nearer to each other than the first and second, second and third, fourth and fifth, fifth and sixth, or sixth and seventh; the semitones falling between the third and fourth, and seventh and eighth; the remainder of the spaces representing the tones. To impress on the mind of the pupil the fixed situation of the tones and semitones in the major diatonic scale, he makes use of *manual* signs, the hand being opened to represent the tones, and closed for the semitones, which the pupils imitate, and sing, repeating these manual signs. As sounds are invisible, and cannot therefore be seen, we have certain signs to represent these sounds. These signs, called notes, are next explained, as also the rests, according to their relative values. The pupils are then taught the position of the notes on the stave. The entire compass of the human voice (comprising the voices of men, and those of women and children) is explained by the large stave of eleven lines. This large stave of eleven lines is divided into three parts by the use of clefs, each clef representing certain five lines taken from the large stave.

The Sol clef, being most frequently used, is first learned and practised. To insure the remembrance of the names of the notes, and also the production of the correct sound, the hand is again employed, but in a different manner. The whole hand represents the stave of five lines, each finger a line. The teacher touches each finger, and mentions the name of the relative line in the stave, and which is repeated by all the pupils. The names of the notes in this method are not the same as the English, as it is more convenient to make use of little words, although without meaning, to the letters of the alphabet.

C	D	E	F	G	A	B
Do	Re	Mi	Fa	Sol	La	Si

When the pupils are perfectly conversant with the names and situations of the notes, both on the stave and hand, they learn the sounds according to situation. Many musicians object to the hand, yet Wilhem has considered the preparatory exercises of singing by the hand as of the greatest importance. Each pupil is desired, in Solfaing the exercises, to touch on his fingers the position which the teacher points to, and in this manner the *sight*, the *touch*, the *ear*, and the *voice*, are all equally practised, and so impressed with the sound emitted, and with the position of that particular sound on the stave, that, on again touching or pointing to a similar position, the same sound is immediately recalled to the memory with an astonishing correctness and precision. There is another advantage in the use of the hand; it saves the time of the teacher in practising any difficult passages, by his immediately referring to the position on the hand, repeating the particular passage until it be correctly performed, and having his eye on the pupils, and his ear attentive to their singing, while he is pointing to the notes he desires to have repeated.

Jean Jacques Rousseau attributes to Guido d'Arezzo, in the eleventh century, the first use of the hand to represent music. The principal masters who followed Guido d'Arezzo were Elias Solomon, who flourished about 1274, and Engelbert, in 1331. The hand of the ancients was somewhat different from that now used; but it is unnecessary to state in what the difference consisted. We confine ourselves to the hand, as at present employed, which is as follows. The sounds or notes are



represented by touching the middle of the fingers, or space between the fingers, both the tip and the root being required for a different purpose afterwards.

When the pupils have learned the descriptions and positions of the notes, with their respective names and sounds, they are taught the value of time, which is done by making four beats with the hand, saying, down, left, right, up; this is repeated by the whole class several times; then again the four beats, saying on the first beat semibreve; again four beats, saying minim on the first and third beats; then again four beats, saying crotchet on each beat; but as the word crotchet is rather difficult to repeat quickly, the last syllable is dispensed with, and crotch alone used. Thus, the relative value of each note is more firmly impressed on their minds than before; namely, that a crotchet, being of the value of one beat, the minim two beats, and the semibreve four beats, the minim must be twice as long as the crotchet, and the semibreve twice as long as the minim. The teacher now proceeds to the division of musical passages into

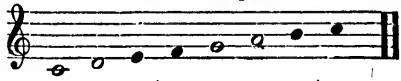
small portions, called bars or measures; some passages being divided into portions, of which each contains four beats; others, into portions or bars, containing three beats, &c.; but as the common time, or four beats in each bar, is the most simple, it is first practised. The pupil is also taught the signatures of the different times; thus, common time, or four beats in the bar, marked C; all others according to the value in the bar, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{12}{8}$, &c. In the exercises on time, &c., no note is used of smaller value than the crotchet, until the pupils have overcome that and a few other difficulties.

Harmony and melody are next proceeded with, the former being different sounds sung at the same time; the latter being different sounds, sung one after the other: the former requires several voices; the latter can be sung by one voice; thus these parts are explained in the most simple manner. To show the difference between harmony and melody, the whole class is desired to give the sounds Do, Mi, Sol, Do, in succession, being the first, third, fifth, and eighth, of the major diatonic scale, forming melody. Having done so, the class falls into four divisions, each division singing one of these sounds; then the whole sing together, each their own notes, and thus produce harmony, forming the common chord of the scale of Do.

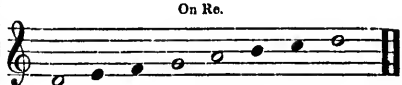
The pupils now commence the study of the Intervals, but before proceeding further, a few directions are given as regards the articulation, the production of sound, the manner of inspiration, &c., which are referred to occasionally. The three different kinds of exercises used after this are, 1st, Solfaing—to sound each note of a passage to its name of sound. 2d, Vocalizing—to sound each note to the same vowel. 3d, Singing—to articulate words while sounding the notes. The teacher now explains that the intervals are named according to the degrees which they contain, as from Sol to La, two degrees, a second; from Sol to Do, four degrees (Sol, La, Si, Do), a fourth; from Sol to Fa, seven degrees (Sol, La, Si, Do, Re, Mi, Fa), a seventh, &c. The pupils are put on their guard respecting the difference between "a unison," and "when in unison." A unison is no interval, and as therefore the practice of the unison would be merely a repetition of one note, its practice is mixed with the interval of the second. The pupil also learns that of each interval, except the octave; we have two kinds, larger or smaller; that they are larger or smaller according to the number of tones and semitones which they contain; thus a second may be major or minor, the former being the tone, the latter the semitone; a third, major or minor, the major containing two whole tones, the minor a tone and a semitone; a fourth, perfect or sharp, the perfect containing two tones and one semitone, the sharp three tones, hence also called a tritone, &c. To each of these intervals exercises are attached for the practice of that particular interval, mixed with exercises on time, accentuation, and others; when the pupils understand each interval, and can sing all the exercises correctly, a song is given, arranged with no interval greater than that just learned, but including all that has preceded it. As a consequence of this arrangement, some of the first songs employed must be very simple indeed; yet as it is for the benefit of the learner that it should be so, no objection ought to be raised to it on that account. Having arrived at the intervals of the fourth, the quaver is first introduced, with a few exercises; again the pupils are desired to make the four beats, but with this difference, that two notes are given or sounded to each beat instead of one, as formerly; showing that two quavers belong to each beat in place of one crotchet, as before. Thus the interest of the learner is always kept alive, and difficulties gradually introduced to enable him to overcome them, without straining his faculties too much. Here and there are introduced other subjects, such as the different Italian words used in music to denote loudness or softness; again, others expressive of quickness or slowness; others, marks of accentuation, the inversions of the different intervals, &c. &c. After having overcome all the intervals from the second to the eighth, there are recapitulary exercises, in which all that the pupil has hitherto learned is indiscriminately mixed together, the major and minor intervals, time, expression, accentuation, inversions, &c. &c.; and strict injunctions are given to the teacher on no account to proceed further until the pupils thoroughly understand and perfectly perform all that has gone before.

All that the pupils have as yet learned has been in the major diatonic scale of Do, but they have also been taught that every musical passage is in *some* particular scale; this sentence alone would imply that there were *many others;* he is now told that each note of the original may become a foundation or a commencement of another scale, and be called the first of that scale; this *first* note of any scale is called the tonic. He also knows that every major diatonic scale must have a succession of tones and semitones in a regular definite order; thus, tone, tone, semitone, tone, tone, tone, semitone. But were he to commence on Re, the note immedistely above Do, and consider it as the tonic, he will find that the tones and semitones do not follow as before—

Scale commencing on Do.

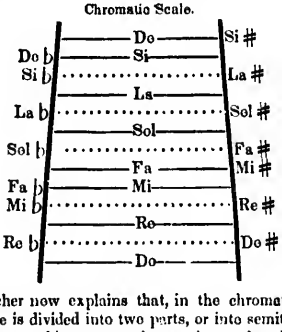


On Re.



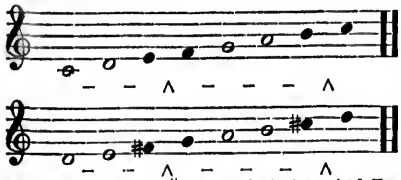
The pupil must remember that the semitones fall between Mi and Fa, or the third and fourth sounds of the scale, and Si and Do, or seventh and eighth of the scale; but on examining the scale of Re, as above, the pupil will find that the semitone falls between the second and third, and the sixth and seventh of *that* scale, which is incorrect. To make this be understood, Wilhem again recurs to the vocal ladder, but a little different from the former—

Chromatic Scale.

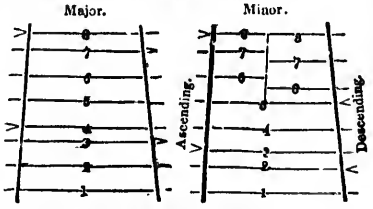


The teacher now explains that, in the chromatic scale, each tone is divided into two parts, or into semitones, by which means thirteen sounds can be produced, each a semitone apart from the other; that a tone can be divided into two semitones in two ways, either by lowering the upper sound or raising the lower; thus, Sol may be depressed or Fa raised a semitone, for which purpose certain characters or signs are required, which, being placed before any given note, raise or lower that note one semitone, namely, the ♯ (sharp), to raise, and the ♭

flat), to lower; but as it is sometimes desired to bring such a sharp or flat sound to its natural state, another character is used, the ♮ (natural). Now, the pupil will observe, that if he place a sharp before Fa, in the scale of Re, it will raise that sound a semitone; and if he place a sharp before the Do, it will also raise it a semitone—



By placing the sharp (♯) before Fa, he has raised Fa a semitone above what it was before, making the difference between Mi and Fa a tone, the difference between Fa ♯ and Sol being altered as a natural consequence to a semitone, by which the regular order is in this instance obtained. Again, in the same manner with the ♯ before Do, the semitone is transferred from between Si and Do to between Do and Re; thus the semitones fall between the third and fourth (Fa ♯ and Sol) and seventh and eighth (Do ♯ and Re) sounds of the major diatonic scale of Re. In this manner the pupil is taught to place the tones and semitones in their proper positions in all the scales. To practise the divisions of the tones, &c., the hand is again employed, the tips of the fingers representing the flat sounds, and the roots the sharp sounds. The teacher now shows that every minor interval can be made major, and every major interval minor, by placing a sharp or a flat before *one* of the notes composing it; also that an interval does not change its character when *both* the notes composing it are made sharp or flat. In practising these intervals, the manual signs representing the tones and semitones are again employed. The various pieces of music to be sung or Solfaed after this, have a more varied character, and consist of rounds, canons, solfeggios, songs, &c., in two, three, or four parts. Some of the airs are written in different keys, to show the effect, and to accustom the pupils to transposition from one key to another. The distinction between the diatonic and the chromatic semitone is next explained; the former being formed by two notes a semitone apart, standing on *different* degrees; and the latter by two notes a semitone apart, but standing on the *same* degree, and bearing the *same* name. The diatonic semitone is therefore a *minor second*; the chromatic semitone a sort of exaggerated *unison*. The pupil now proceeds to the order in which the major diatonic scales follow each other, according to the number of sharps or flats required to place the semitones in their proper positions. A table is then presented to him, showing the order, commencing on Do, ascending by fifths requiring sharps, and descending by fifths requiring flats. This table is used for occasional reference by the pupil. The teacher next explains the minor scale, the difference between the major and minor scales in the succession of tones and semitones ascending and descending, &c.; for which purpose Wilhem employs the vocal ladder, showing that, in the minor scales, the third of the scale is always minor; hence the name. The tones are marked —, semitones <.



Then follows a table with the major scales and their *relative* minors, having the same signatures.

Having hitherto only learned *common time*, with an even number of beats in each bar, the pupil's attention is now directed to time, with an uneven number of beats in the bar, called *triple time*, to practise which three beats are made in each, but in an opposite direction from the former. In the commencement of the study, the pupil is taught the three clefs, but only one has been practised, namely, the Sol clef. Having advanced thus far, Wilhem again introduces the large stave of eleven lines, with its principal divisions, by the Sol, Do, and Fa clefs, and also shows that the large stave of eleven lines can be subdivided into seven staves of five lines each, according to the extent of the different voices. The pupil is next taught how to transpose any piece of music from one scale to another, by changing the signatures, and using different clefs; but it is unnecessary here to present examples of the manner in which this is done; for full information on the subject, we refer to the accessible works of Wilhem and Hullah.

ACCOU[illegible] OF THE HUMAN BODY.

THE external appearance of the human body is necessarily familiar to all. Its internal structure, however, and the manner in which its different functions are performed, are not understood as they ought to be by the generality of people. The more fully that we comprehend the structure of our frame, the more attentive shall we be to its preservation in a state of health, and the more capable of accomplishing that all-important object. The present treatise will therefore be devoted to a description of the human body, in language as popular as the subject will permit, and as concise, at the same time, as possible.

Zoological science places the human being in the class of *Mammalia*, or suck-giving animals, and in the order of *Bimana*, comprising the two-handed creatures of that class. An erect posture is the peculiar characteristic of man, and it is one which gives to his aspect that dignity becoming his high place in creation. By the adaptation of an erect structure, also, his hands are left disengaged, and ready for the numerous operations to which he is inclined by his judgment or urged by his wants. His general stature is between five and six feet. A combination of hard and soft parts forms the material of his frame, the soft portions being arranged, generally speaking, upon and around the more solid parts of the structure. These latter parts consist of a beautiful framework of bones, formed the *skeleton*, which naturally occupies the first place in our description. *Muscles* and *tendons*, which are the organs of locomotion; the *brain* and *nervous system*, or organs of sense, feeling, and intellect; the *lungs*, for respiring the air essential to the maintenance of the principle of life; the *stomach* and *digestive organs*, for the supply of nourishment; the *heart*, *blood-vessels*, and *absorbents*, for the circulation of vital fluids through the body;—these and other important parts will fall to be described after the solid framework on which they rest has received its due share of our attention.

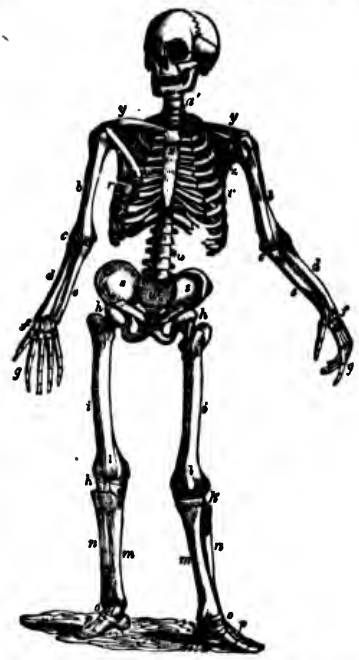
The skeleton comprehends three main divisions, the head, trunk, and extremities, which consist, in all, of 254 bones, joined together in a manner combining great strength with ease and freedom of motion. The whole of the bones are composed of nearly the same materials, namely, earthy matter, chiefly lime, and gelatine or animal glue. The lime gives them hardness and solidity, while the animal matter cements or binds them together, and renders them not easily broken. They differ to some extent in solidity and weight. A middle-sized adult skeleton, weighed all together, ranges between 160 and 200 ounces, or from 10 to 13 pounds avoirdupois. The heaviest bones in the body, in proportion to their size, are the bones of the skull, extremities, and pelvis, or under part of the trunk. Their surface is for the most part smooth, and the interior, beneath a cake or coating of more condensed substance, is porous and spongy. The bones of the extremities are hollow, like pipes, by which arrangement they are rendered at once light and strong. The marrow is contained in the internal cavity. Compact as they are, the bones are nevertheless pervaded by blood-vessels, which, indeed, are essential to their vitality.

The crown or summit of the osseous fabric is occupied by the cranium or skull, which is composed of eight bones, the *frontal*, the *occipital*, and the two *parietal*, constituting the greater part of the outward skull, before, behind, and laterally. The two *temporal* or temple bones, on the under part of each side, and the sphenoid and ethmoid bones, placed at the base of the skull internally, are the remaining bones of the head. The union of these bones is remarkably firm and strong in the adult being. In some cases, the osseous plates are joined by serrated or ragged edges, like the teeth of a saw. In other instances, they overlap each other, like the ridge of a house; the arrangement, in each case, being precisely the one best fitted to ensure strength and stability in the particular part. Altogether, an arch of the most powerful kind is formed, for the safe protection of the important organ within, the *brain*. The bones of the face, situated below and before the cranium, are numerous. Among the facial bones are reckoned the two upper *maxillary* or jaw bones; two *malar* or cheek bones; two *nasal* or nose bones; two small bones, attached to the nose internally, called the *turbinated* bones; two *palate* bones; the two *lacrymal* bones, situated in the orbit; the *vomer*, or ploughshare bone, forming a part of the basis of the nose; and the single lower jawbone or *maxillary* bone of the lower jaw.

The bones of the skull and face rest upon the top of the spine or backbone, which consists of twenty-four separate pieces, called *vertebræ*, firmly and curiously jointed the one into the other. The column of the spine is curved in several places, the most prominent being a curve forwards near the middle of the back. Seven of the vertebræ are called *cervical*, twelve *dorsal*, and five *lumbar*, from being situated respectively in the neck, back, and loins. Each vertebra has various projections and depressions, to admit of a firm union with those adjoining it; and, by the junction of the whole, a long hollow or canal is made, for the reception of the spinal marrow. In the annexed figure, the upper part of the vertebral column is marked *d*, and the lower *a*. The second of the vertebræ of the neck sends upwards a projecting pinion or tooth, which is received into a corresponding depression in the one above, thus forming the pivot upon which the head turns.* The bones of the spine rest upon the *pelvis*, *s e*, a hollow, basin-shaped cavity, which is formed of two large bones, and composes the lower part of the trunk, giving to it firmness and stability. The spine rests on it by means of the *sacrum*, a series of five imperfect vertebræ, consolidated into one piece in advanced life, which sink like a wedge between the pelvic bones of each side. The sacrum terminates in a loose osseous peak, called the *os coccygis*. The strong, hollowed, cup-like bones of the pelvis, are marked by large round depressions on the outer and under surface of each, which form sockets for the two upper bones of the leg. At the top of the spine, immediately below the vertebræ of the neck, are situated on each side the collar-bones or *clavicles*, *y y*, which are long and narrow in shape, and pass in a semicircle or arch from the front of the chest backwards, or, in other words, from the *sternum*, *x* (breast-bone), to the top of the shoulders. On the back of the ribs, at each side, lie the shoulder-blades or *scapulæ*, which are thin flat bones, of a triangular shape. They rest loosely on the back, having scarcely any attachment except by muscles to any of the neighbouring bones. By this means they have a

* A ligamentous band keeps the tooth-like projection of the second vertebra in the depression of the first. Nothing can better show how completely our life, during every instant of its duration, depends on the maintenance of every single part, however minute, in order. If this ligament, scarcely thicker than strong paper, were to give way, instant death, from pressure on the spinal marrow, would ensue. A porter, carrying a burden, dropped down dead. On examination, no cause of death could be found, till this apparently petty ligament was noticed to have given way, producing instantaneously the fatal result.

free and easy motion, and also communicate the same property in part to the arms, the upper bone of which is



attached, on each side, to the scapula. A very small cavity in the latter bone admits the round ball-like head of the humerus, giving to it the most unconfined play of movement, whether of a rotatory kind, upwards, downwards, or sideways. Nothing can be more beautiful than the whole arrangements for permitting the arm to perform the multifarious motions which man requires from it. The *humerus*, a single bone in each arm, *b b*, cylindrically shaped, is united at the elbow-joint, *c c*, to the two bones of the fore-arm, termed the *radius*, *d d*, and *ulna*, *e e*. One of these, the ulna, is attached to the humerus, by a hinge-joint (like that of a common door), while the radius is connected to the same bone by a round button-like head, which, being slightly concave, receives a projecting knob of the humerus, and admits of rotatory movements being performed by the lower part of the arm. These peculiarities of structure are essential to the free use of the hand. At the wrist, the position of the radius and ulna is in some measure reversed, the radius forming with the *carpal* bones, *f f*, a joint like that of a door-hinge, while the ulna is in a measure left loose. The carpal or wrist bones are eight in number. They are of small size, and lie in two rows, being jointed together in a manner that combines great strength with a certain degree of mobility. In the direction of the points of the fingers, they are united with the *metacarpal* bones, forming the palm of the hand, and to which the *phalanges*, *g g*, or finger bones, are attached. Each finger has three bones in it; the thumb has only two.

As has been said, the bones of the pelvis, on each side, are marked by deep cup-like concavities, which receive the heads of the thigh-bones, *h h*, *i i* (*femur*), the upper bones of the lower extremities. As was required by the different nature of the purpose to be served, the ball and-socket joint of the leg is much stronger than that of the arm and permits of much less freedom of motion. The *femur* or thigh-bone is a rounded cylindrical bone, terminating at the knee in a connection with the *tibia*, *m*, the principal bone of the inferior part of the lower extremity. The knee-joint is a hinge one, but permits of a slight rotatory motion when the leg is bent. The tibia has a smaller bone, the *fibula*, *n n*, placed by its side, and over the knee-joint is situated a small bone called the *patella*, *l l*, or knee-pan, to which the principal muscles that move the joint are attached, and which serves to protect the parts against injury. The tibia and fibula form a union at the ankle, *o o*, with the bones of the tarsus, which are seven in number, and constitute the heel or back part of the foot. These again are united to the *metatarsal* bones, *p p*, forming the body of the foot, and five in number. To these again are joined the *phalanges* of the foot, fourteen in all, two being attached to the great toe, and three to each of the others.

The *costæ* or *ribs*, *r r*, proceed from the vertebræ or backbones, and are twelve in number on each side. They bend round in a circular manner from their point of union behind, and seven of them, called the *true ribs*, are joined directly by gristle or cartilage to the breastbone, while the remaining five terminate anteriorly in a common cartilage, which unites with the sternum below. Altogether, the ribs form a large hollow space for the reception of the lungs, heart, and other organs, and protect them from injury. The ribs move in an easy joint formed with the backbone, and, with the intercostal muscles, contract and expand to suit the motions of the lungs.

These are the principal bones forming the skeleton of the human being. All animals have not this osseous framework; it is only found in a certain number of classes, including man, quadrupeds, birds, reptiles, and some fishes, all of which, from the principal feature in their structure, are called vertebrated animals. Some of the other tribes of beings have their framework, corresponding in purpose to bones, on the outside of the body, in the form of a coat of mail. This is the case with the shellfish, as the lobster, and with many insects that have a hard external covering, as beetles.

THE MUSCLES.

The soft fleshy substance of the body, which gives plumpness and form to the whole, is the muscular part, or *muscles*. These are the instruments of motion. And when we consider the various positions which the body and its members assume, the agility and quickness with which the most intricate movements are made, the ceaseless play of the heart, the heaving of the lungs, and the singular rapidity of articulation and speech, we need not be surprised that these muscles, upon which all such movements depend, should be many in number, and deemed important agents in the animal economy. The muscles are of a reddish brown colour; they are composed of accumulated threads or fibres, arranged sometimes in layers, sometimes in a straight position, and sometimes obliquely. They are of an elastic nature, somewhat like a piece of India rubber, and, at the impulse of the will, are lengthened and shortened alternately. A muscle is generally thick or swelled out in the middle; it gradually gets thinner towards the extremities, and, in many instances, passes at one or both ends into a tendon, or tough white substance, which is attached to a bone, and serves the same purpose as a rope or cord, to fix the muscle to the point from which it is intended to act. These tendons are most numerous about the joints, especially the larger joints, where they allow of free and unrestrained action, and yet occupy little space in situations where a large swelling muscle would have been inconvenient. About the larger joints of the body, also, such as the knee, elbow, and shoulder-joints, there are numerous glands, which pour out an

ony substance, that serves to lubricate the joints, and facilitates the play of the tendons. There are from four to five hundred muscles in the human body, all necessary for performing the various movements and operations of the complicated machine. On each side of the backbone there are several layers of strong muscles, which are fixed by tendons to every projection of the numerous bones composing the spine. These muscles keep the trunk of the body erect, and also permit of the various motions of the back. There are a multitude of small muscles about the face, head, and eyes, whose various action imparts that expression to the human countenance which indicates the prevailing feelings and passions of the individual. The tongue is also supplied by intricate muscular fibres, giving to it that amazing volubility of action by which the vast number of sounds composing language are expressed. Many are attached to the lower jaw; but two in particular, the temporal muscles, proceed upwards through an arch formed by a projecting arm of the temple-bone, and are fixed to the tendons of the head. These two muscles are the most powerful in moving the jaws in the operation of chewing the food, and are very large in several animals of prey. Another flat muscle inside the cheek is called the trumpeter-muscle, because it assists in blowing from the mouth and in sounding wind instruments. The chest is supplied with numerous muscles, which move the ribs upwards and downwards in the action of breathing. A large flat muscle, called the diaphragm, stretched across the trunk from side to side, and separating the hollow of the chest from that of the belly, also contributes mainly to the process of breathing. The arm and hand are rolled inward and outward by a set of muscles, which are placed on the outer and inner sides of the respective bones; thus, the outside muscles act in a contrary manner to the inside, and reverse motions may be alternately performed. The muscles of the fore-arm are fixed to the scapula or shoulder-blade, to the cheat, and to the clavicle, at the upper end, and to the bone of the arm at the other. The fingers are moved by muscles situated in the forepart of the arm, and have long slender tendons, by which they are attached. Two beautiful provisions of nature are here observed: at the wrist, a circular ring of tendinous substance binds down the long tendons, which would, in their various motions, otherwise start up from their places. This ring at once keeps them in place and permits their free and unhampered play. The other provision is seen in the construction of the tendons of the fingers. There are two principal muscles which move the joints of the fingers, and two sets of tendons, which are inserted, the one into the middle bones of the finger, the other into the third row of bones, or the extremities of the finger. In order to preserve their free action, and to make them lie in the most convenient manner, there is a loop or slit in the shorter tendon, by which the other passes through to its insertion in the point of the finger. By this means, the longest and strongest muscle moves the extremities of the finger, where the greatest power is wanted, without impeding the action of the other. The muscles which move the lower extremities are thicker and more powerful than those of the arms. Several large muscles, acting in opposition to each other, are situated around the thigh-joints, and move them. They are fixed, one end to the trunk of the body, some pretty far up, especially two, which are spread upon the front of the abdomen or belly, on each side of the spine, while the other ends are attached to the thigh-bone. Several thick muscles, also, are situated at the back of the trunk. Two large muscles compose the calf of the leg, and join to form the tendon of Achilles, which is fixed to the heel-bone; these muscles act powerfully in bending the ankle and in supporting the body in walking. The foot and toes are moved by several long slender muscles, situated in the leg, which have tendons attached to them, and terminating on the toes, exactly like those of the hand and fingers. The pelvis and lower limbs of man differ greatly from those of all other animals in their superior proportional strength, and in the number and fulness of the muscles. This was necessary, as man has been evidently intended by nature for the erect position. In the monkey tribe, whose general form approaches nearest to that of man, the narrowness of the pelvis or hip-bones, and the smallness of the muscles of the lower extremities, clearly show that they were not destined by nature for the erect attitude; in fact, all animals of this class are furnished with four *hands* or *paws*, the hinder pair exactly resembling those in front. When they attempt to walk on the hind extremities, they cannot put the sole to the ground, but press on it edgeways. By the nice balancing of the muscles, and the great force which they exert, man is enabled to stand erect, and to maintain a firm position, or move forward at pleasure, notwithstanding that the body diverges from the perpendicular line of the centre of gravity. The head is also balanced upon the neck by means of strong muscles, whose constant though unobserved exertion is necessary to maintain it in its position; for in young children, when the muscles are as yet weak, and in persons asleep, the head has an inclination to droop, and in the dead body it falls down on the shoulder or breast. The muscles of the neck, therefore, may be said to exercise a power in some degree involuntary, or not under the command of the will, as the majority of the muscles of the body are. But there are other muscles still more distinctly removed from under the guidance of the will. The heart is nothing else than a hollow muscle, which contracts and expands without the consciousness of the being; and, in like manner, the muscles which perform the act of respiration are not moved by the will. This division of the muscles into two classes shows, as perfectly as any thing could do, the care with which our frame is constructed. Had those muscles on which respiration and the action of the heart depend, been placed under the control of the being, their functions would have been liable to be impeded, at every turn, by circumstances. Now, these organs cannot cease to act for the most trifling period of time, without fatal consequences. The arrangement, therefore, which renders their operation involuntary, is one to be admired as essential to life and comfort.

THE BLOOD—BLOOD-VESSELS.

The Blood.—The blood is the medium by which all the solid and fluid parts of the body are supplied with nourishment. In its composition, therefore, will be found the majority of the substances of which the body is composed. The blood consists of a solid coagulable matter, called *fibrin;* of a series of *red globules* which form the colouring matter; and of *serum*, or whey-like matter, which gives the whole the necessary fluidity. From the heart, the centre of the circulation, the blood is conveyed through the body by vessels called *arteries*, and is brought back to the same part by *veins*. The purpose of its thus making the circuit of the whole body, is to supply the necessary materials for increasing the bulk and repairing the daily waste which takes place by perspiration and the perpetual operation of the numerous excretory organs. The blood is restored to its nutritious state by the chyle, a juice formed in the stomach and intestines from the digested food; this chyle reaches the heart by one of the large veins called the left subclavian; from the right side of the heart it goes along with the venous blood to the lungs, and there it is mixed with the oxygen, or vital portion of the atmospheric air, by which process it is converted into bright red arterial blood. In short, there are two distinct circulations of the blood in the system. By the one, the blood is conveyed and distributed over all parts of the frame, imparting, at every pulsation of the heart from which it issues, new life and nourishment to

the whole. After traversing the body, it returns to the heart, deprived of its nutritious properties, and changed in colour from a bright to a dark red. Here the second circulation, which is through the lungs, commences. The blood is poured from the right side of the heart, which has divisions for the purpose, into large vessels which carry it to the lungs, and, spreading out into countless branches, penetrates and permeates their whole substance. Collected again by other vessels of equal number and extent, it is conducted by them to the left side of the heart, to be propelled anew through the frame, restored to its bright red hue, and repossessed of all its vivifying qualities. Both these changes are effected in the lungs. The chyle, which may be called the essence of our food in a liquid state, is conveyed from the stomach through the chest by a duct, which empties itself into one of the veins, immediately before the blood is transmitted through the lungs. It is in these organs that the chyle is thoroughly mixed up with the circulation; and it should be remembered, that this chyle is the only benefit, the only real food, extracted from all the substances received into the stomach, the remainder being entirely useless and excrementitious. From the chyle comes the material of the bones, of the fleshy or muscular parts, of the brain and nervous cords, of the hair, nails, enamel of the teeth, and, in short, of every different structure of the system. The average quantity of blood contained in an ordinary-sized person, is calculated at about 30 lbs. weight. The coloured globules of blood do not enter into the smallest vessels of the body, but only the thinner part of it, which has no colour; thus, in the eye, there are numerous blood-vessels, but these are so minute as not to admit the red parts of the blood; and this is a necessary provision of nature, in order that these organs may retain their pure transparency for the purpose of vision. In inflammation of the eyes, when these vessels are much enlarged, the red globules sometimes enter, and the eyes are then said to be blood-shot. What is called the pulse, is the flow of the blood through the arteries, which is caused partly by the impulse of the heart's contractions or beatings, and partly by the contractions of the coats of the arteries. The rate of pulsation in a person in the prime of life, is from 65 to 75 beats in a minute. In childhood the pulse is much quicker—from 100 to 140 beats; and in old age it again becomes slower than the medium standard. In fevers, inflammations, and other diseases of excitement, the action of the heart is increased sometimes to form 100 to 140 pulsations in a minute.

Blood-Vessels.—These consist of the heart, with its arteries and veins, that branch out through every part of the body, and carry the blood, by constant circulation, through them. The heart is placed in the left side of the chest, a cavity divided into two parts by a thin membrane running perpendicularly down the centre, and supported below by the diaphragm. It is of a round or conical shape, with the base or broad part uppermost, and the point slanting downwards and towards the front surface of the chest. It is of a thick muscular substance, with hollow cavities inside, and numerous cords or pillars of fleshy or tendinous substance stretching through these to give them support. In man and all the more perfect animals that breathe air through the lungs, it is double, or has two distinct sides, each performing separate offices. In fishes, again, the heart is single; in insects there is no proper heart, but a vessel that runs along the back; somewhat like an artery, through which the fluid corresponding to blood circulates through their bodies; other animals, still more simple in structure, have no trace of heart or blood-vessels. For these ends, the heart in man has two sides, a right and left; and each of these sides contains two hollow cavities—the one called an auricle, from its fancied resemblance to a dog's ear; the other a ventricle, or belly. The manner in which the circulation of the blood is effected may thus be described in detail:—Two large veins, one from the upper part of the body, the other from the lower, enter the right auricle of the heart, and carry the blood, which has made the round of the body, into this cavity. Here it is of a dark purple colour, and it is called venous blood, from its coming from the veins. From the right auricle it is sent, by a sudden contraction or forcing together of the two sides of the cavity, into the right ventricle, immediately below the auricle, and communicating with this by a small opening furnished with a valve; by the right ventricle contracting, it is conveyed by the pulmonary arteries into the lungs, the two large cell-formed substances on each side of the chest, surrounding the heart. After passing through the lungs it is returned by the pulmonary veins to the left auricle of the heart; from this it is sent into the adjoining left ventricle; and, by a powerful contraction of this muscular cavity, it flows out by the great artery of the heart, the carotid, which distributes it through every part of the body, again to be returned by the veins: and thus the round of circulation is continually going on.

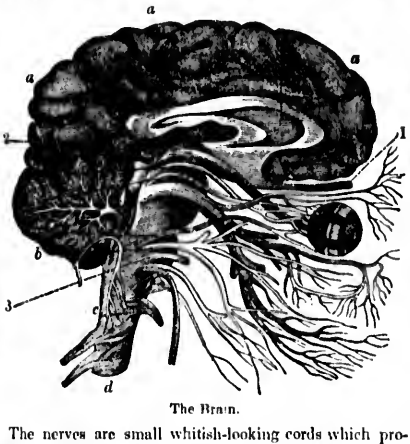
The heart being an extremely thick muscle, the force with which it contracts is very considerable. The left ventricle of the heart, too, although somewhat smaller, is much thicker and more muscular than the right, it having to send the blood through the whole of the body. A beautiful provision is observable in the heart, to prevent the flowing back of the blood into its different cavities during their alternate pulsations. In the passage of communication between the left auricle and ventricle are placed valves, which, when the ventricle contracts to send the blood through the aorta, close accurately, so as to prevent a reflowing into the auricle. There is the same provision between the right auricle and ventricle, and also at the mouth or commencement of the aorta and pulmonary arteries, and the veins which communicate with the right auricle. Some of these valves are of beautiful structure; they are composed of three flaps that join accurately over each other; and to prevent their being pushed by the impetus of the blood beyond their proper position, they have little tendinous cords attached, of exactly the length required. In the child before birth, as it cannot breathe, and therefore the lungs are not used, there is a small hole or communication between the right and left auricles, by which the blood from the veins flows directly through the arteries, and thus avoids going to the lungs; this hole closes up whenever the child begins to respire. The aorta, or great artery of the body, after it leaves the heart, passes upwards in the form of an arch, when it gives off the carotid branches to supply the brain, and face, and arteries to the arms and chest. It then bends downwards, and gives off branches to the stomach and other viscera; and when it comes to the lower part of the belly, it divides into two main parts, which become the arteries of the pelvis, thighs, and legs. The arteries of the body are composed of three coats or coverings, the principal one being a thick muscular ring, which encircles the artery, and which contracts and expands so as to assist in sending the blood onwards. The principal trunks of the arteries lie deep in the fleshy parts of the body, but their ramifications are so numerous and minute, that they pervade every particle of the human structure—bones, gristle, and every other texture. These extreme branches of the arteries being so minute, anatomists have had great difficulty in tracing the exact point at which they pass into veins. That they do so, however, is undeniable, and is partly seen on the surface of the brain. The veins are another system of vessels, which return the blood from the extremities of the body to the heart. They are larger and more flaccid than the arteries, and are distinguished from them by having no pulsation. A large vein generally accompanies the corresponding artery, but the great proportion of the veins lie more towards the surface, and are easily distinguished, swelling out under the skin. The numerous veins from the lower extre-

cities join into one trunk in the belly, which vein, after passing through the liver, as will be afterwards described, joins the right auricle of the heart, the blood from the upper half of the body joining also by another similar vein. In the veins of the extremities that hang downwards, and are apt to be gorged with blood, there are inserted numerous valves, at short distances, which prevent reflux of any kind.

THE BRAIN—NERVES AND NERVOUS INFLUENCE.

The brain, as already mentioned, is contained in the cranium. It is a soft mass of matter, enclosed in certain protecting membranes beneath the bones of the skull. As the organ by which mind acts, and chief seat of the nervous energy, the brain may be described as the most important and dignified of man's bodily parts, and well deserves the most careful investigation. The brain is divided by strong membranes into two main sections—the cerebrum or proper brain, which lies in front beneath the brow and on the top and sides of the head, and the cerebellum or lesser brain, which lies behind. Both are longitudinally divided into halves or hemispheres, and also into lesser parts called lobes. The annexed figure offers a lateral representation of the different parts of the brain, as it lies beneath the skull, with its beautiful and minute radiation of nerves proceeding to the eye and other external instruments of the organs of sense.

The cerebrum or principal part of the brain is indicated by the letters *a a a*. The cerebellum, distinguished by the letter *b*, terminates below in the *medulla oblongata*, *c*, the cylindrical pulpy cord by which a union is formed between the brain and *spinal marrow*, *d*. The latter part is the long cord of soft matter formerly mentioned as lying in the canal formed by the range of the spinal bones. It is round, of the thickness of the finger, of the same kind of substance as the brain, and formed of smaller nervous cords, running parallel to each other: it runs along the whole length of the back down to the pelvis.



The Brain.

The nerves are small whitish-looking cords which proceed from the brain and spinal marrow, and spread out in innumerable branches to every part of the body. A large branch of a nerve generally accompanies every large artery, and every important part of the body has a branch of a nerve sent off to it. The nerves for supplying the organs of smell (1), of seeing (2), of hearing (3), together with the great sympathetic nerves, which give branches to the heart, lungs, stomach, and other important viscera, proceed directly from the brain. The nerves of motion and sensation sent to the various parts of the trunk and extremities, take their origin, with a few exceptions, from the spinal cord. Two sets of nervous branches proceed from the cord on each side, corresponding nearly to the junction of every vertebral bone: and it is found that a branch of these nerves imparts motion, and the other sensation or feeling. The brain has a covering of three thin membranes; the outward one strong and thick, the inner extremely thin and delicate. The nerves, which are soft and pulpy inside, have also a thin external covering which protects them. The nervous branches are never seen or felt in the living body, and what are vulgarly called nerves are the tendons of the muscles, the erroneous title being given chiefly to those about the wrists, fingers, and ankle-joints. Their great numbers and minute divisions are manifest, however, because we cannot prick any part of the body with the sharp point of a needle, without wounding some of them, and thereby causing the sensation of pain. When the nerves are injured in their powers by disease, the sense of feeling in the part is entirely lost. The brain in the lower animals is not generally so large in proportion to their bulk, as in man; and the cerebrum, or upper brain, is often smaller in them than the cerebellum, or lower brain. In many classes of the inferior animals there is no distinct brain, but only nerves running along their bodies and joining into knots or ganglions. The nervous system of insects and worms is of this description. In the polypus and some other similar animals, a distinct nervous system can scarcely be traced.

It may be proper here to make some observations on the functions of the brain, considered abstractly from its anatomy. Man surpasses all other animals in the height and proportions of the forehead, and in the comparative mass of brain in the upper part of the skull. In the human head the lower parts of the face bear a smaller proportion to the forehead than in the brutes. The face is placed in nearly a perpendicular line with the forehead, instead of projecting outwards into a snout, as in the lower animals. The brute face is merely suited for the purpose of animal wants and for defence; the jaws are long and narrow, supplied with thick, strong muscles, and short teeth; there is not the elevated nose which in man forms a distinguishing feature—the arched eyebrows—the exquisitely formed lips, and the rounded chin; above all, there is not that play of varied expression, that air of intelligence, and that indescribable emanation of a rational mind, that ray of divinity, at the appearance of which the most wild and ferocious of the brute creation are awed and subdued. But, besides, the Creator seems to have allotted characteristic external signs to express the passions of the mind, that in social life man might not easily impose on his fellow-man; for the various muscles of the face express the several passions of the mind so faithfully, that they may be even represented in painting. This is said to be the natural expression, and would appear to be understood even by animals; for a dog, on looking to the countenance of his master, easily recognises the mute expressions either of commendation or dissatisfaction. From the action of these muscles being so often repeated, physiognomy arises; the action of the prevailing muscles fixes an enduring expression on the features; and thus traces of frequent anger often remain in the countenance after the passion itself is gone off. With the power of speech and reason, man has also the means of expressing his feelings and passions by laughter and weeping, manifestations which are not found in the lower animals. Weeping proceeds from a deep emotion of the mind, and seems an effort of nature to relieve the system of grief. It usually begins with deep inspirations of the lungs, after which follow short alternate inspirations and expirations, and it is finished with a deep long-drawn expiration, which is immediately followed by an inspiration. When moderate, it certainly relieves the distress arising from grief. Laughter has its rise from some ludicrous ideas impressed upon the mind, and would seem to arise directly from a sort of titillation

conveyed to the branches of certain internal nerves, probably those of the diaphragm; immediately to this succeeds a number of imperfect inspirations and expirations, which seem to be checked by the contraction of the glottis in the throat or larynx Laughter in a moderate degree may be conducive to health, as it gives impulse to, and ultimately promotes the circulation; carried to excess, however, it may prove dangerous, from accumulating too much blood in the lungs. Sneezing consists of one deep inspiration, succeeded by a powerful single expiration, and seems to consist of a convulsive effort of the muscles of breathing to throw off some cause of irritation in the sensitive membrane of the nostrils. The common hiccup is a spasmodic action of the muscles of the stomach, caused by something irritating the stomach itself. Some of the causes by which our mental happiness is either increased or diminished, proceed entirely from the bodily sensations. Any gentle stimulus applied to a nerve seems to cause a feeling of pleasure; strong stimuli, or any causes disturbing seriously the natural condition, produce pain. Itching is akin to pleasure, and in both cases the flow of blood is increased into the part in which either pleasure or titillation is perceived; but when farther increased, it degenerates into pain, or excessive sensations in the nerves. Anger violently excites the motion of the spirits, increases the motion of the heart, the frequency of the pulse, and the strength of the muscles; forces the blood into the extreme vessels; and even sometimes bursts the smaller vessels themselves: passion also increases the secretion of bile. Grief weakens the strength of the nerves and action of the heart, retards the pulse, destroys the appetite, and frequently produces paleness, 'oseness of the bowels, indigestion, and those slow or lingering diseases that take their rise from an interruption of the secreting glands, and a disease of their structure. Fear diminishes the force of the heart, weakens the muscular motions, relaxes the whole system, and, if long continued, causes a general sinking of the body. Excessive terror often increases for the moment the muscular strength, even to convulsions; excites the pulse, interrupts the course of the blood, and in not a few instances has produced sudden death. Love, hope, and joy promote all the salutary actions of the body, gently quicken the pulse, promote circulation, increase the appetite, and aid the cure of diseases. Excessive and sudden transports of joy, however, often prove fatal, by increasing the motion of the blood, and exciting a fit of apoplexy. Shame in a peculiar manner retains the blood in the face, as if the veins were obstructed; when felt in an extreme degree, it has also been known to prove the cause of sudden death.

THE LUNGS OR BREATHING APPARATUS.

In the highest part of the cavity of the chest, on each side of the breast-bone, the lungs are situated. A membrane passing from the breast-bone to the back, divides them into two portions, the right lung and the left lung. The right lung consists of three sections called *lobes*, the upper, middle, and lower; the left lung, rendered smaller in bulk by the presence of the heart in the same cavity, has only an upper and a lower lobe. The lungs have a dark bluish appearance, a familiar example of which is afforded in the *lights* of sheep, that part generally appended to the heart and wind-pipe. Inside they are composed of an immense number of cells, which alternately inflate or collapse as the lungs are filled and emptied of air. When an inspiration is made, and the lungs are filled with air, these cells become expanded; and the blood sent from the right side of the heart and spread over the cells, is exposed through an extremely thin membrane to the air. An important change, as formerly alluded to, here takes place on the blood: from being of a dark purple colour, it immediately changes to a bright

having absorbed or taken up all the oxygen or vital part of the air, and parted with a corresponding volume of carbonic acid gas or fixed air, which it had acquired in its circuit through the vessels of the body. So essential is the matter imparted by the air to the blood for sustaining animal existence, that the breathing cannot be suspended even for a very short period without extinguishing life. It is probable, too, that the heat of the body is generated and constantly kept up, in some way or other, by means of this process of breathing, and the change which the blood undergoes. We know, at least, that the evolution of carbonic acid cannot go on, in ordinary chemical processes, without an accompanying discharge of heat; and hence it is presumed that the vital warmth derived by the body from the blood, may be in this way produced. The lungs, like every other internal organ, are covered with a thin transparent membrane called the *pleura*: this membrane, as well as the substance of the lungs themselves, is liable to inflammation; and hence the name of the disease called pleurisy. The trachea or wind-pipe, the communication between the mouth and the lungs, is a hollow tube, having a series of cartilaginous rings passing round it, to prevent the possibility of its being compressed either by external means, or from the food in the act of swallowing, and, in consequence, the breathing obstructed. It takes its rise from the bottom of the mouth, and passes down in front of the neck, where its strong cartilage may be seen and felt. At its lower part it divides into two parts like the prongs of a fork, one going to join the right section of the lungs, the other the left. Lungs for breathing air are only found in the higher classes of animals. Fishes are furnished with gills, those comb-like substances which lie within a flap on each side of the head; over them a stream of water is constantly sent by inhaling it at the mouth in a similar manner to breathing. The air, which is always present in considerable quantities in water, is thus absorbed by the blood-vessels while ramifying over the gills, and all the purposes of breathing are answered. In insects there are no lungs, nor do they breathe by the mouth, but along the sides of their bodies, by means of numerous holes with small tubes or spiracles leading to a longer middle tube, by which the air enters and mixes with their fluids. When we descend lower in the animal scale, even this substitute for breathing ceases, and probably the vital air is absorbed by such animals by simple pores or openings in the skin.

THE TEETH.—DIGESTING APPARATUS.

The first process performed in connection with the supply of nourishment to the body is that of masticating the food, and this is the office of the teeth.

The Teeth.—These are placed in the upper and lower jaw, to which they are attached by roots, which sink into the porous sockets of the jaw, somewhat in the same manner as a nail is fixed in a piece of wood, though they are retained in place chiefly by the softer parts around. The teeth are composed of bony matter, covered externally with a thin coat of an extremely hard substance, called enamel. The teeth are furnished with nerves and blood-vessels, and have thus vitality like the rest of the body, although possessing it in a less perfect degree than most other parts of the structure. Hence they are very liable to disease and decay. In decaying teeth a blackish spot is first perceived upon the outer crust or enamel; this substance gradually gives way, and then the bone below proceeds to rapid decay. The irritation of the air and particles of the food inflame the nerves and soft pulpy parts inside, and thus the excruciating pain of toothache is produced. The first set, or temporary teeth, begin to make their appearance in the child about the fifth or sixth month, and towards the end of the eighteenth month the whole set of temporary teeth, consisting of twenty, have generally cut through the gums. These teeth continue till about the sixth or seventh year, from which time, till

about the twelfth or thirteenth year, they gradually fall out one by one, and are succeeded by the second or permanent teeth. The roots of the temporary teeth are much smaller, and sink less deep into the jaw than their successors. The rudiments of the second set of teeth begin to form early in cavities below the others, and, gradually growing and pressing upward, displace them. The number of the permanent teeth is thirty-two, consisting of sixteen in each jaw. The four front teeth are called the incisors, and have one long root; on each side next to these is one eye or dog tooth; then there are placed two small grinders on each side, having double roots, and three large grinders, or molar teeth. The last of these is called the wisdom tooth, from its making its appearance latest in the jaw, from the seventeenth to the twentieth year, or even later. By this change and gradual succession of teeth, we have a beautiful provision of nature for permitting the jaws to increase in size, and, at the same time, for preserving the relative positions and regularity of the different teeth; for had the first teeth of childhood been permanent, it is impossible that the jaw could have increased in growth without deranging the order and position of the whole. The teeth of various animals differ according to the kind of food on which they live. In carnivorous, or flesh-feeding animals, the teeth are sharp-pointed, and adapted for tearing their prey to pieces; in those animals called graminivorous, that live on grasses and other herbage, the teeth are of a rounded form, with broad surfaces, and the grinders are furnished with several layers of the hard enamel, following each other in succession, with a slight layer of common bone interposed; so that, when the grinder is worn down by the friction of chewing, it is not rendered useless, but a new layer of the enamel is presented at the worn-down surface. Some animals, as the hare, rabbit, beaver and mouse, have the front teeth of a chisel shape, with enamel only on the outer side of them. These animals are called gnawers, because they chew or gnaw down their food in this particular manner; and by the inner soft part of the tooth being liable to be worn down, while the outer is harder, the enamel is thus always kept with a sharp edge. Some animals have large projecting tusks for defence, as the elephant, wild-boar, &c.; others, as fishes, are provided with teeth, more for holding fast their prey than for mastication. Many have no proper teeth at all, as birds, worms, and other soft formed animals. Man is characterized by having all his teeth set close to each other in a half circle; they are of a medium form, between that of carnivorous and herbivorous animals; the front teeth are adapted for cutting; the canine are sharp, though not of undue length; and the grinders are suited for masticating vegetable and farinaceous matters, as nuts, &c. In short, the form of the teeth of man evidently points out that he is adapted to live on a mixed kind of diet, or a conjunction of vegetables and flesh.

Stomach.—Behind the windpipe, taking its rise also from the bottom of the mouth, lies the œsophagus, or tube which passes into the stomach. This tube expands at the top into what is called the pharynx, forming the whole of the upper part of the throat immediately behind the tongue. Into this cavity the windpipe opens, and, to guard against any particle of the food or drink passing into the windpipe instead of into the passage to the stomach, there is a little tongue or valve which closes accurately over the mouth of the windpipe every time food or drink is swallowed. When the substances have passed, the valve again springs open and admits of free breathing. To show how accurately and precisely every part of the human machine performs its duties, a celebrated writer has instanced this same valve, which, in a multitude of persons dining together, not one time out of a hundred in any one individual instance is at fault. When a drop of fluid or particle of food does by chance insinuate itself into the windpipe, so sensitive is this tube, that a convulsive cough is excited till it is again expelled. There is another little tongue or flap attached to the roof of the palate, and seen above the tongue when the mouth is opened. This, which guards the passage to the nose, is not, however to be confounded with the other, which is farther down the throat, and invisible. The œsophagus, or gullet, passes down through the chest, traverses a ring in the diaphragm, that large muscle which stretches across the lower ribs, and which assists so materially in breathing. Immediately below this muscle, on the left side, is situated the stomach, which is partly sustained in its place by being attached to the œsophagus, or tube from the mouth. The stomach is an oval bag of considerable size, occupying a slanting position immediately below the heart, with its right side overlapped by the left edge of the liver, and extending to the lower end of the breast-bone. The stomach has three coats—an external membranous one, a muscular, and a soft villous inner covering. The upper passage, by which this bag communicates with the œsophagus, is called the *cardiac* opening; the lower, where the first gut commences, is called the *pyloric* orifice.

Digestion.—One of the most important operations in the animal economy is that of digestion, whereby the various substances used for food are dissolved in the stomach, and undergo changes, by which they are formed into matter fit for entering into the composition of the different parts of the body, to nourish its growth, and supply the daily waste which takes place in the system; for such is the constitution of animal bodies, that the substances of which they are composed are liable to constant waste; the solid parts are worn down, and a large quantity of fluid is constantly given off by the exhalent vessels, both from the skin and the surface of the lungs. This is manifest in the sweat and the vapours exhalations constantly passing off by the mouth; and there is also an imperceptible perspiration regularly proceeding from the surface of the body, which has been computed to amount to several pounds in the course of a day. It must be evident, therefore, that if this waste was allowed to proceed but for a very short period, the body would soon be reduced to a state of complete decay. A constant supply of new material is therefore daily needed, to replace that which is wasted; and thus it has been supposed that a human body changes its whole materials many hundred times from the period of its birth till death; and that an individual, as regards his mere corporeal structure, is not at all the same at the period of manhood to what he was when a boy, nor in old age what he was in his prime. Although this change then is complete, even to the bones and most solid parts of the frame, it is brought about so gradually, and with so regular and minute substitution of one particle for another, that it is never perceptible. Man has been called, with relation to his diet, omnivorous, from his being adapted to live on every kind of food, whereas most other animals are confined to one particular description. The carnivorous animals live on flesh alone, the graminivorous on grass and green herbs, and the granivorous on grains and other smaller seeds. These animals never change their respective diets; nor, from the construction of their teeth, stomachs, and intestines, were they ever intended to do so. But in man it is plainly evident, from his anatomical structure, that he was intended to feed on every sort of food promiscuously, or that he could adapt himself to either animal or vegetable fare, as habit or necessity impelled him. Man also differs from brutes in resorting to the arts of cooking, whereby the food is put into a state more fitted for digestion, and for yielding a sufficiency of nutritious aliment. The food being received into the mouth, is broken down and masticated by the teeth. It is here also

reduced into a soft pulp by the saliva, which flows into the mouth by the salivary glands; and thus being sufficiently broken down and softened, it passes into the stomach. The stomach has numerous glands situated on its inner coat or surface, which secrete a peculiar fluid called the gastric juice, which is clear and colourless, with little taste or smell, or sensible qualities. On this fluid depends the important office of digestion. It has the power of coagulating substances in the stomach, of preventing the contents of the stomach from passing into a state of fermentation or putrefaction, and of dissolving the whole into one homogeneous mass. When the stomach is first filled with food, it appears to remain there for a short period without undergoing any change; gradually, however, successive portions of the food, as they come into contact with the gastric fluid, are dissolved; till at length, in a shorter or longer period, the whole is collected into a thin grayish paste, called chyme. In the upper or left division of the stomach, it would appear, from some recent observations, that the food is freed from its superabundant moisture, which drains off by some undiscovered means to the blood-vessels, and from thence to the kidneys. The chyme then, as it is gradually formed, moves to the other extremity of the stomach, called the pyloric, where it passes out to enter the intestinal canal. It would appear, also, that the pylorus, or lower mouth of the stomach, has a sensitive power, whereby it freely permits the digested chyme to pass out, but refuses exit to the undigested matter. The chyme having passed into the first part of the intestines or duodenum, is then mixed with the bile from the gall-bladder, and with the pancreatic juice. Both these substances, especially the bile, seem essential for the conversion of the chyme into proper alimentary matter, but their peculiar action has not yet been satisfactorily explained. That the liver and bile ducts are of the utmost importance, however, cannot be doubted, from their magnitude, and the care with which they are supplied with numerous vessels, and from their being universally present in a great proportion of animals. The chyme having passed through the duodenum, and having been mixed with the bile and pancreatic juice, now changes its appearance and properties, and becomes the chyle, or nutritious matter destined to supply the various parts of the system with nourishment. The digested mass is passed gradually along the course of the small intestines, urged forward by what is called their *peristaltic* motion, which is effected by a successive contraction of their fibrous coats. Here the minute mouths of the lacteal vessels, opening on the inner surface of the small intestines, take up the chyle, and carry it, as has already been described, to the receptacle of the chyle, and then by a duct running up the chest along the spine, called the thoracic duct, it joins the blood-vessels. The refuse of the aliment which has not been taken up by these lacteal vessels passes on through the large intestines, and at length is ejected from the body. Digestion is not brought about, as has by some been supposed, by any mechanical means, as by the grinding powers of the coats or sides of the stomach, nor by heat alone, nor fermentation, nor by the simple resolution of the food into a fluid; but it is evident that it undergoes a series of chemical actions in the stomach and bowels, whereby its nature and properties are completely changed; and thus animal and vegetable substances, however different, are reduced to one peculiar kind of fluid, the chyle, which, though it may be found to vary slightly according to the kind of food, is, in its general properties, always the same. The gastric juice varies in different animals. In those which feed on vegetable matter, it dissolves these substances only; whereas grain and vegetables pass through the stomach of a purely carnivorous animal without undergoing any change. The gastric juice has this singular property, too, that though it readily dissolves dead animal matters, and reduces them in a short time to a thin pulp, it will not usually act on the living fibre; so that, after death, the coats of the stomach have been found dissolved into holes, by the same juice, which, in the living body, had no such effect. This forms a most important fact in medical jurisprudence. A stomach of some kind or other is found in all animals; for it is by this organ that nutrition and growth are solely promoted. There are some very simply formed animals whose whole body consists of an oval hollow bag, or stomach, with a simple outlet for the mouth to take in nourishment, and no other organ whatever. The common polypi have simply a mouth and hollow stomach, with several tentacula, or arms, by which the creature seizes the worms and grubs on which it feeds; these it swallows, abstracts their juices, and then voids the remainder from its mouth. The common leech has its whole body divided into a number of small cells, like a piece of honey-comb; and these receive the water, and sometimes blood, on which it feeds. Flesh-feeding animals have a simple bag for a stomach, and their food is easily and soon digested. Those animals, again, that feed on grass, which is of more difficult digestion, have three and four stomachs, into which the food successively passes after it has been masticated or chewed a second time in the mouth. This is the case with cows, sheep, deer, &c. Birds that feed on grain have first a sap-bag, or crop, into which the food enters, and remains for a considerable time, mixed with a juice somewhat like saliva; here it is softened and rendered moist, preparatory to its passing into the true stomach, or gizzard, which is an extremely strong muscular bag; in this, with the assistance of a number of sharp-pointed pebbles, which such birds always swallow, it is ground down and acted on by the gastric juice. This compensates for the deficiency of teeth in fowls. Crabs and lobsters have no teeth in their mouths; but in their stomachs will be found three or more teeth, which assist in grinding down the tough sea-weed on which they feed. By domestication, the qualities of the gastric fluid may be so changed, that animals accustomed to live entirely on flesh will exist and thrive on a vegetable diet. This is the case with dogs, and many birds. All these peculiarities in the natural history of animals illustrate, at least directly, the uses of the digestive organs in the human being.

THE LIVER, ETC.

The Liver.—Opposite the stomach, on the right side, lies the liver, a large flat substance, of a dark brown colour, divided into two lobes. The liver has a round, convex, upper surface, and is hollow or concave below; it is also thick and solid at the back part, and its edge becomes thinner towards the front, where it lies over a portion of the stomach and bowels. It is suspended in its place by several ligaments attached to the surrounding parts. In the under side of the liver, in a small hollow, is situated the gall-bladder, a small oval bag which contains the bile. A tube from this bladder, called the bile-duct, passes into the upper portion of the bowels, carrying the bile there. The liver is supplied by several branches of an artery in the usual way that the other organs are, but it has also a peculiarity which no other organ of the trunk possesses. The large veins, which return the blood from the lower part of the bowels, before going to the heart, enter the substance of the liver, and there spread into innumerable branches throughout its whole surface. From this venous blood the bile is supposed to be secreted, and after having yielded this substance, the vessels collect again into one large trunk, and join the large vein which carries the blood to the heart. The liver weighs, on an average, from three to four pounds weight, and the quantity of bile which it secretes, taking into account its large supply of blood,

must be very considerable. The greater proportion of animal beings are provided with an apparatus of some kind or other for preparing a supply of bile, and in many the liver bears a large proportion to the other contents of the belly. In some animals, as the horse, the gall-bladder is awanting, there being merely a duct to convey the bile into the intestines. In the lowest classes of animals, all traces of liver or gall-ducts disappear.

The Spleen.—This substance is situated below the stomach, on the left side, betwixt it and the ribs. It is in shape a flat oval, and of a dark iron colour. No duct or opening has been discovered proceeding from it, nor has its use been as yet accurately ascertained. It possibly serves to relieve the stomach of its surplus quantity of blood while this organ is distended with food; and the splenic vessels have also been held by some to contribute to the secretion of the gastric juice. The spleen, it is remarkable, has been frequently cut out from living dogs, without causing any apparent derangement in the health or digestion of these animals.

The Pancreas.—This substance, known under the name of the sweetbread, is a large oblong gland (or *secreting* organ), lying across the back part of the belly, extending between the spleen and the middle of the liver. This gland pours out a substance something like the saliva or spittle of the mouth; and by means of a small duct or canal, empties it into the upper bowels, along with the bile from the gall-bladder, both these substances aiding in digestion, and the preparation of the nutritious fluid to be afterwards mentioned.

Lacteal Vessels.—These are innumerable small tubes, proceeding from the ileum or small intestines, along their whole course, and spreading along the mesentery, where they form an immense number of small knots, or glands, by joining together. These are the vessels which take up the fluid chyle, or milky-like substance, after it has been digested and properly prepared in the stomach and bowels. From these mesenteric glands, the chyle is conveyed by these ducts or canals to another large gland, situated in the loins, on the right side of the aorta, and immediately below the diaphragm, called the receptacle of the chyle. From this receptacle the thoracic duct arises, and passing upwards by the side of the aorta, or great artery of the body, it joins the left subclavian vein, lying under the left clavicle or collar-bone, and thus pours the whole of the chyle into the general circulation.

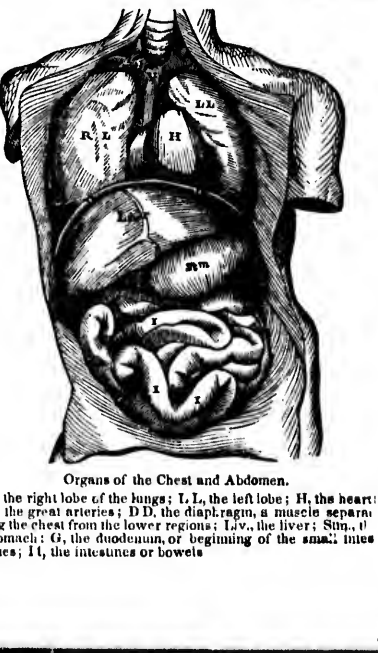
The Kidneys.—These are situated in the loins, one on each side of the back-bone, about one-third up the spine. They are in shape somewhat like a French bean, and their internal structure consists of a number of minute porous tubes. They each at the middle hollow part receive a large artery, and their use is to filter from the blood the superabundant fluid, and salts and juices unnecessary for the system, and transmit these, by means of two small tubes, called the ureters, to the urinary bladder. These tubes enter the back part of the bladder in a slanting direction, which serve the purpose of valves, preventing a flowing back of the fluid when the bladder is full. The bladder is situated in front, immediately above the bone of the pelvis, called the pubis.

The whole cavity of the belly is lined by a thin membrane, called the peritoneum, which is double, being reflected from the sides of the cavity over the whole of the intestinal organs. This peritoneum is liable to inflammation, in the same manner as was mentioned of the pleura, which produces a very violent disease. The coats of the intestines, too, are also subject to the same affection. Dropsy may arise from water being formed between the two folds of the peritoneum.

The Lymphatic Vessels.—These are another distinct set of vessels spread over all the inner cavities of the body, and also throughout the skin, on which they open by innumerable small mouths. Their office appears to be to take up from the blood a thin lymph, which they convey into the receptacle of the chyle and thoracic duct, and also to exhale or carry off from the skin the superfluous moisture of the body. This moisture forms the sweat, and several pounds of fluid are daily drained off from the body in this manner, even when little or no bodily exercise is taken, for perspiration continually goes on insensibly. These vessels are composed of a series of extremely small tubes, and, joining and interweaving, form numerous glands, especially in the groin, armpits, and neck; when swelled by disease, they harden and enlarge, forming knots like a pea or bean. But they are no less numerous on the surface of the inner cavities of the body as on the skin; they are found in the brain, or on the surface of the lungs, where they give out a large proportion of vapour at every expiration of the breath, and in the abdomen or belly. It is a disease or sluggishness of these vessels, whereby they do not perform their necessary duty of taking up all the superabundant fluids, that causes accumulations of water in the chest, belly, and legs. The branches of the lymphatics of the lower half of the body join the receptacle of the chyle; those of the upper part enter the thoracic duct just before the latter pours its contents into the subclavian vein.

THE BOWELS.

From the lower or pyloric orifice of the stomach, the duodenum, the first portion of the intestinal canal, takes its origin. This gut passes below the liver and receives the bile-duct, and the duct from the pancreas, when it terminates in the jejunum, which again passes into the ileum, or principal portion of the small intestines. These are of great length, and occupy a great part of the abdomen, being folded and twisted backwards and forwards in many intricate windings. At the end of the ileum, the colon, a large gut, makes an arch upwards towards the right side, and across the belly, and descending at the back part, ends in the short bag, called the cæcum, which joins the rectum, the termination of the intestinal canal. The whole length of the intestines in man is generally about six times that of his average height, or from thirty to thirty-six feet. In all animals that feed on vegetables, the intestines are of great length; whereas, in those that derive their nourishment from animal food, they are of much shorter proportions. Two membranous substances,



Organs of the Chest and Abdomen.

R L, the right lobe of the lungs; L L, the left lobe; H, the heart; V, the great arteries; D D, the diaphragm, a muscle separating the chest from the lower regions; Liv., the liver; Stm., the stomach; G, the duodenum, or beginning of the small intestines; I I, the intestines or bowels

called the omentum and mesentery, run along nearly the whole length of the intestines, and serve as a means of their attachment and proper suspension in their places. The bowels have three coats—an external one, common to them with the other viscera, a muscular coat, and an internal mucous covering.

It is of the greatest importance to health that the bowels, through which all rejected matter from the stomach is to pass, should be kept in an easy open condition, and that there should be a free passage through them once every day. When nature fails in this respect, a small quantity of medicine, under proper advice, may be taken; and the irritation which it causes usually leads to the desired result.

THE SENSES.

Man possesses five senses—sight, hearing, smell, taste, and touch, each of which acts through the medium of appropriate instruments, and all regulated by and acting in connection with the brain.*

Sight—the Eye.—The eye is the exterior instrument of sight, and is a most beautiful and ingeniously constructed object. The eye may be compared in its structure to a telescope, the purpose of both being to collect the rays of light proceeding from the surface of bodies, to concentrate these rays, by means of a refracting lens, into a focus, and, therefore, to form a very small image or picture of the object before them. The human eye is placed in a large hollow or socket in the upper bones of the face, surrounded by fatty substance, and the various muscles necessary for moving the eyeball and eyelid. At the upper and outer angle of the eye-socket is placed a gland, which secretes the tears that serve to moisten the delicate surface of the eye, to wash off any dust or other substance, and to keep the eye continually wet and transparent, for the purpose of perfect vision. The tears, after spreading over the eyeball, collect at the inner angle, where, at each corner of the eyelid, both above and below, there is a small opening visible, which carries the tears down a passage into the nose. The edges of the eyelids are also supplied with glands, which pour out a mucous that prevents them from adhering together; and these, when irritated and inflamed, are often the seat of disease. The membrane which covers and imparts the white colour to part of the eyeball in front, is called the sclerotic coat. The middle transparent part of the eye in front is called the cornea, which is filled with the aqueous humour of the eye. Immediately behind the cornea is seen a circular fringed-like substance, which varies in colour in different individuals, being blue, black, hazel, &c.; and hence it is called the iris, or rainbow curtain. This iris has the property of opening and closing, according to the quantity of light which falls upon the eye; and thus the pupil, a black circle contained within the iris, is enlarged or lessened. Behind the iris is situated the crystalline lens, in shape resembling the small lens or ground glass of a common telescope, but of unequel swell on each side, being more flattened before than behind. This lens is contained within a capsule, or thin covering of delicate membrane. A familiar example of the lens of a fish's eye is presented every day in that white globular substance found in such eyes after boiling. The heat coagulates the lens, which is of the same nature as the white of an egg; and in the fish it is nearly a circular body, to adapt the animal's vision to the dense medium of water. The lens is the substance which receives the rays of light entering the eye, and refracts or bends them inwards, whereby they are collected into one point upon the back chamber of the eye, or retina, and thus a minute pictur of the object seen is formed. If a bullock's eye is taken when fresh, and a hole cut in the skin covering the back part, and then presented to the light with a piece of white paper put opposite the hole, a representation of the objects in front of the eye will be distinctly traced on the paper. When through disease the lens becomes of an opaque white colour, and will not transmit the rays of light, the affection is known as the cataract, producing blindness. The fluid filling the lens is called the crystalline humour. Behind the lens is the back chamber of the eye, filled with a fluid, called, from its thickness, the *crystalline* humour. Over this back chamber the retina is spread out like a lining or covering. It is covered over with a black pigment, the better to prevent the intermixture or reflection of the rays of light. On this membrane the optic nerve, which comes from the front part of the middle brain, and enters the eyeball at the back part, spreads out in numerous branches; and here the small images of the outward objects presented to the eye are painted in mininture. All these objects are painted on the retina in a reversed position, or turned upside down, the same as happens in a common microscope; and how they are perceived in their upright position through the medium of sensation, is a curious question, not easily admitting of explanation. Each eye, too, forms a distinct impression of every object, and yet things are not seen double, but both eyes combine to give one impression to the brain or seat of perception. Besides the numerous muscles which roll the eyeball in various directions, to adapt it to the various positions of vision, there seems also a power, in the cornea or front portion of the eye, whereby it can flatten or become more convex according as the object viewed is at a greater or less distance from the eye, thus adapting itself to the focus of vision in a similar manner as the joints of a telescope are drawn out or pushed inwards. When the cornea is, from its natural form, of too rounded or convex a structure, distant objects are always seen imperfectly, hence causing what is called nigh-sightedness; on the other hand, when it is too flat in form, near objects are then seen indistinctly. This change occurs generally to the cornea as old age approaches, and hence spectacles, or artificial rounded lenses, to aid the flatness of the eye, are in such cases made use of with the desired effect. From the different densities of the three humours composing the eye, the refraction, or breaking of the light into the various coloured rays, is avoided. This for a long time was a great objection to telescopes, till different kinds of glass were joined together in the lenses, thus imitating the resources of nature in the eye. The eyes are supplied by two large optic nerves, proceeding by separate trunks from the brain; they join together for a short space within the cranium, where they again separate, and each entering an opening at the back part of the orbit, spreads out into branches over the retina. Sometimes these nerves lose their power of sensibility, and total blindness is occasioned without any perceptible disease of the eye: this is called *amaurosis*, and is in most cases incurable. All the larger and more perfect animals are possessed of eyes. Birds have in general very acute vision, especially birds of prey, to enable them to distinguish their victims at a great height in the air. They have also a third eyelid, or transparent membrane which covers the eyeball when they are darting suddenly through the air, and which thus protects the delicate organ of the eye from injury, at the same time that it allows the transmission of a sufficient quantity of light. Fishes have eyes of a somewhat different

* What may be called a *sixth* sense is almost if not altogether demonstrated, namely, the *muscular sense*, or that by which we are made sensible of the condition of our muscles, as acted upon, for the moment, by gravitation and the resistance of matter, in order to enable us by our powers of voluntary motion to command these muscles. Sir Charles Bell has thrown much light on this subject by his discovery of distinct origins for the nerves of feeling and motion, although they are found undistinguishable, in their substance, in the same sheath. Hunger and thirst are *sensations* also, and so perfectly different from all others, that they have been held by some to be the effects of a seventh sense.

form from land animals, to adapt their vision to the denser medium of water, through which the rays of light pass to their eyes. Insects have great numbers of small eyes clustered together, and most probably they are of microscopic structure. Many of the inferior animals, as shellfish, worms, &c., have no eyes.

Hearing.—The ear is the instrument of this sense. The outer part of the ear is formed so as to collect and transmit the currents of air into the passage which leads to the drum. This passage is of a winding description, and, besides being defended at its mouth by a number of small hairs growing up in it, there is also a waxy substance constantly secreted, which keeps the whole moist, and is an effectual bar to the entrance of insects or other offensive substances. At the inner end of this winding passage is the thin membrane or drum, which is stretched out on four small bones, and which, by its vibrations, conveys, through the medium of the nerves, the sensations of sound. There are also attached to these small bones several muscles, which, by their contraction and relaxation, modify the tension of the thin membrane, and prevent sounds from acting too strongly on it, or render it tighter, in order to be even sensible to feeble vibrations. Behind the cavity of the tympanum, or drum, there is another passage which leads from the ear to the mouth, called the *Eustachian tube*, the object of which is most probably the same as the holes in the common drum, to allow the air to escape from behind, and thus promote the vibration of the membrane of the tympanum; for it is found, that if such holes are not made in a drum, little or no sound will be produced; and in the human body, when this tube, leading to the mouth, is choked up by the inflammation of a common cold, deafness is produced. There is another cavity called the vestibule of the ear, covered over also by a thin membrane: on this membrane the nerves of hearing are expanded, and convey the sensations of sound to the brain. The sense of hearing is very acute in some animals, especially those that live by prey. In the lower orders of beings the sense is awanting, but is compensated in a considerable degree by the extreme acuteness of feeling, or touch, which is so diffused over their bodies as to make them sensible of the least agitation in the air by which they are surrounded.

Smell.—The nose is the instrument of smell, and is of comparatively simple structure. The bones forming its inner cavity are of a spongy nature, or rather are composed of a number of very thin plates, covered with a soft membrane, over which the branches of the nerves of smell are minutely exposed. The effluvia proceeding from bodies, and which imparts their peculiar odour, must pass in a stream or current through the nose before the odour is perceptible. If the air is perfectly still, and no current allowed in the nose by suspending the breathing through that organ, the strongest smells will make no impression. In some animals the sense of smell is acute and powerful, beyond the conception of human beings; thus a dog, by the acuteness of this sense, will distinguish the footsteps of his master amid those of a hundred other people, and can thus trace him for miles, although he has been a long while out of sight; pointers also scent game at a great distance. On the other hand, this sense is entirely denied to many of the lower animals. In man it is in many cases very imperfect, and may be blunted, or even extinguished, by disease. In colds affecting the delicate membranes lining the nostrils, the smell is very much diminished.

Taste.—The sense of taste is nearly allied to that of smell. The nerves of taste are spread over the upper surface of the tongue, and are raised up in innumerable small points, like the pile of velvet. In the lion these papillæ are very large, and easily distinguishable. No other part of the mouth is endowed with the property of tasting, except the tongue, as may be proved by touching any part of it with a piece of salt or sugar, when no sensation of taste will be communicated until the tongue has come in contact with the part so touched. That the taste or flavour of many bodies is heightened by the accompanying effects on the organ of smell, is evident; because, if the nose is stopped up so as to prevent the exercise of its functions, many substances having different flavours will tas alike. This is the case with the various kinds of wines, but especially with the ardent spirits. It is almost impossible to distinguish between the flavours of different kinds of spirits if they be tried in the dark, and with the passage to the nose accurately shut up. The tongue and whole cavity of the mouth and throat are kept moist by the saliva, or spittle, which continually flows into them from repositories placed around the cheeks and under the tongue, called salivary glands, which communicate with the mouth by means of small ducts. This saliva flows in greatest quantity during meals, and may even be excited by the sight of food when the appetite is good. It is of essential service in moistening the food, and preparing it for the process of digestion in the stomach. The sensation of taste is in all probability diffused among every class of beings, however low in the scale of existence, although it is probable many animals possess little of it in their mouths, especially when these are formed of hard, horny, or even earthy substances, as in many insects—the lobster, crab, &c. —and where any organ corresponding to a tongue is wanting. Even many birds that feed on grain and hard bodies, not chewed or broken down in the mouth, must have little sensation of taste.

Touch.—The sensation of touch is diffused more or less over every part of the body, but is most perfect at the points of the fingers, which in man are generally used to examine the figure and texture of bodies. For this purpose they are furnished with a large supply of very minute blood-vessels and nerves. It would appear that there are different nerves that convey the sensation of touch, distinct from those which are the nerves of motion; and that these proceed in pairs from the spinal marrow; and that, moreover, the sensation of heat or cold may be perceived very distinctly, in cases where the pricking of a needle or contact of other bodies is never felt. The sense of touch may be said to belong to every animated being, and is one great characteristic of animal existence. Vegetable bodies possess a certain degree of life, and show what is called irritability of their fibres; but they have no sensation, properly so called; they are not sensible of pain or injury, as the lowest and simplest sentient animal is; neither have they the compensating perceptions of pleasure. It is probable, however, that sensation is not by any means equally acute in all animals; some feel more intensely than others, and it is a happy provision of nature that it should be so. The lower insects and reptiles, from their structure and habits, are continually exposed to injury; and did they feel it as acutely as the larger animals, the degree of animal suffering throughout nature would be excessive. Many animals bear the loss of limbs with impunity, and have the power of restoring these lost members in a very short time. It is probable that, according to the perfection of the nervous system, is the acuteness of animal sensation.

On thus reviewing the different parts of the human body, it will be observed that most of its organs are double. On a line being drawn in the middle, on each side will be found parts which are exactly similar to the corresponding side. This is the case with the brain, which is a double organ, having two series of nerves proceeding out from each side of it to go to the respective sides of the body. There are two eyes also, each reflecting a distinct image on the retina; yet the nerves communicate so that only one impression is conveyed to the sense The arms are double to suit the various purposes for which they are employed, and so are the lower limbs, as

essential requisite for the support of the body, and for progressive motion. The lungs, too, may be said to be double, having two distinct lobes; and it sometimes happens that one of them is entirely shrunk or diseased, and yet the important office of respiration is still carried on. The stomach, the liver, and some of the other viscera of the abdomen, are, however, single, their several offices being common to the whole body.

THE HAIR AND NAILS.

The hair grows out from the skin somewhat in the manner of a vegetable production. Hairs are fixed by roots in the skin, from whence, by a series of minute vessels, they drew nourishment, and continually increase in length. They possess no sensibility, however, and unlike the other parts of the frame, may be cut off without producing the least pain. Hair is of different colours in different individuals—is fair in those of light complexion, and deep black in the swarthy. As old age approaches, and even in many young persons, where there is a particular disease in the hair, or dryness in the skin, this colour changes to gray and white. The colouring matter of the hair is contained in the centre, which is of a hollow form, and consists of an oily substance, in which carbon or charcoal, in minute particles, is more or less mingled. The nails are somewhat like hair in their production and composition; they are, like hairs, insensible to the touch, and may be cut or pared without producing pain. They receive nourishment from the blood-vessels of the extremities, and have a constant growth or renewal of their substance. Nails serve as a defence to the tender parts of the fingers; in animals they form formidable weapons of attack. The horns of cattle are exactly of the same nature as nails, and are chiefly composed of animal gelatine.

The manner in which the various secretions take place in the system, that are to form hair, nails, wax for the ears, blood, perspiration, &c., cannot but excite our admiration; for the whole is a chemical process of the most perfect kind, and such as art possesses no power to imitate.

THE SKIN.

An external compact membrane or skin covers the whole body. The outer skin, or cuticle, is unprovided with any blood-vessels or nerves, and consequently is insensible; in this manner it is well suited for a protection to the parts beneath; it is pierced by innumerable minute pores, which are the mouths of the exhalant vessels: it is thicker in the palms of the hand and soles of the feet than in any other parts of the body. Below the outer skin is a thin membrane, called the *rete mucosum*, which, assuming different hues in different nations, gives rise to the variety of colour in the human race. Some have held this membrane to be double, but this is not established. In Europeans it is white, passing into yellowish brown; in native Americans, of a copper colour; in Negroes, of a deep black. The common belief is, that climate has the effect of modifying the colour of the skin, as the black skin only occurs in tropical regions, and it is found that there it is a protection against the scorching influence of the sun's rays. Negroes will remain cool and comfortable exposed to a sun which would be intolerable to a white-skinned person. Their free perspiration seems to be of great service. Immediately below this network is the *cutis*, or true skin, an extremely sensible membrane, so thickly studded with minute blood-vessels and branches of nerves, that the smallest-pointed needle cannot prick it without touching many of them. On the points of the fingers, lips, and other parts of the body, these vessels are very numerous; and hence these parts are endowed with exquisite feelings of touch. Below the skin is situated the cellular membrane, which is a network, whose interstices are filled with fat, and it thus serves to fill up the spaces between the muscles, and to make up the shape, and preserve the symmetry, plumpness, and beauty of the whole frame. In cases of emaciation, this fatty matter is sometimes entirely taken up by the absorbent vessels—as after a tedious fever or other lingering disease—when the rough outlines and indentations of the muscles, and the projections of the bones, become painfully apparent.

SLEEP.

The various functions of the body are divided into voluntary and involuntary. When we eat we perform a voluntary motion, but digestion is performed without the action of the will, or is involuntary. The whole interior functional operations are involuntary, and go on whether we are awake or sleeping.

As a constant supply of food is necessary to repair the waste of the grosser parts of the body, so sleep is essential for the repose and renovation of the finer and more subtile nervous energy. Mere rest alone will not recruit the animal frame, but sleep, or a profound oblivion of feeling and sensation, and of every external circumstance, seems essentially necessary at every periodical revolution of the day. Toward the close of a day of exertion, the muscular powers which have been employed in motion, and in sustaining the body erect, begin to suffer particularly; the eyes become dim and heavy, and the eyelids close involuntarily; the lower jaw falls down; the circulation of the blood through the lungs is sluggish, hence frequent yawning is caused; the head nods forwards; all external objects affect us less and less; the thoughts become confused; and at last the profound oblivion of sleep ensues. We are unconscious of the exact moment when we pass into sleep, but occasionally it happens that immediately afterwards we are awaked by a convulsive start, which is caused by the sudden breaking in of the powers of volition, when as yet but newly and imperfectly lulled to rest. Sleep is quite essential to existence. Deprive a person of sleep, and the body sinks under the privation more rapidly than under famine. Indeed, no circumstances, however urgent, will prevent the approaches of sleep for any length of time; and under the severest calamities, and even while in the hour of battle, or when suffering from extreme fatigue, or cold, or hunger, sleep steals upon us to steep the senses in oblivion. Healthy sleep is so performed as to resemble, in all that regards self-consciousness, death itself. Sometimes, however, the mind exerts its activity, though it is but a partial exertion; and hence dreams, or thoughts of sleep, are made up of all incongruous associations, such as thoughts of the past day and incidents of long bygone years; scenes of actual experience, and others totally imaginary, being all mixed up and jumbled together. In sleep the heart continues to beat with regularity, and the circulation of the blood is carried on throughout the body; the lungs perform their functions, the stomach digests, and the bowels, and all the glands for secretion, carry on their operations; in short, every thing is carried on connected with the sustenance of the body and the existence of the vital powers; but for the most part all other powers, such as those over which we have a control in our waking hours, are at rest. This is not always the case, however, as walking during sleep, or somnambulism, is a peculiarity to which some individuals are liable. Dreams are most common when the sleep is imperfect or too long continued, and thus they occur frequently towards morning, or through the night, if the stomach is loaded and oppressed with food, or the mind harassed and deeply impressed with cares and solicitudes. In a state of health and serenity of spirits, the most profound and most refreshing sleep is during the first period of the night. When asleep, the circulation and breathing are both somewhat slower than when awake, hence the animal heat becomes diminished; and this is the reason why more clothing is required in bed than during the day. This is the reason, too, why a pe

son lying down to sleep out of doors, or on a sofa, with the usual allowance of clothes, feels chill and uncomfortable on awaking. Digestion, too, would appear to go on less vigorously during sleep; and hence the impropriety of going to bed with a full stomach. During the night and darkness is the most natural and obvious time to select for repose, and it is only the absurd encroachments of fashion that have wellnigh turned day into night. By going early to bed the damps and colds of night are avoided, which is of essential consequence, especially for the delicate. There is also a natural connection of the functions of the body with the periods of day and night, which makes sleep taken in the first part of the night peculiarly refreshing. The absence of every irritation of the head and other parts of the body—the perfect rest of the mind and external senses—have also great influence in promoting sleep. Again, a variety of causes which weaken and debilitate the body incline to sleep; such as great losses of blood, cooling medicines, purgatives, coldness of the atmosphere; and narcotics, such as opium and tobacco, drinking largely of wine or spirituous liquors, by first causing great excitement, and afterwards a corresponding debility of the system, also predispose to profound and lethargic sleep. Injuries of the head, by pressing on or otherwise interrupting the functions of the brain, also induce sleep; and great corpulency, by retarding the return of blood through the veins, and thus keeping up a pressure upon the head, is generally accompanied by a disposition to sleepiness.

The period required for sleep, by different individuals, depends much upon temperament and peculiarities of constitution, as well as on mode of life and habit. While some cannot sleep beyond five, six, or seven hours, others, again, cannot well do with less than eight or nine hours. Children sleep more than half of their time, and require it, and thrive under it; while adults need much less repose. On a general average, eight hours has been reckoned a good allowance. Certainly sleep beyond this does no good, and often does harm. In order to enjoy grateful and uninterrupted sleep, it is necessary that due exercise shall have been taken during the day; that temperance in food and drink shall have been observed; that strong tea or coffee, which have a stimulating effect on the system, shall not have been taken within an hour or two of going to bed; and that there has been no supper, or a light one. It is true, gluttony and intoxication produce sometimes deep sleep, but it approaches more to an apoplectic stupor than the calm repose of the temperate.

THE SEXES.

In almost all animals the sexes are distinguished by a difference of form and texture of their bodies; and in many, a superior gloss of colour in the hair or fur, or a superior brilliancy of the plumage, very generally characterizes the male of the species. In most animals, too, the males are of superior size, and endowed with greater muscular strength. In the human species man is marked by a larger and more muscular body than the female; his chest is square and capacious, and particularly at the shoulders, whence it tapers gradually downwards; his bones are large, and his joints firm and sinewy; his muscles are round, tense, and conspicuously marked: his limbs thick and fleshy, and his arms powerful; his skin is firm and tense, and his hair strong, crisp, and often curly. The female figure, again, is smaller, less powerful, and, in every respect, more delicately formed; the bones are less projecting, the muscles softer, less conspicuous, and more smoothly blended one into the other; the shoulders are narrow and rounded; the greatest breadth of the body being at the pelvis, from whence it gradually tapers upwards; the skin is soft and delicate; the hair smooth, and of a silken appearance. The mental qualities and dispositions differ somewhat also. Man is commanding, resolute, daring, adventurous, addicted to deep and abstract thought, as well as to high and imaginative speculations. Woman is gentle, submissive, timid; with a mind, perhaps, little inferior in compass to man, she is more commonly distinguished for acute penetration, nice and delicate discrimination, refined and chastened taste, and elegant and playful fancy. It was the opinion of Plato, that, with regard to the mind, there is no natural difference between the sexes, but in point of strength. "When the entire sexes are compared together," says he, "the female is doubtless the inferior but in individuals, the woman has often the advantage of the man." With warm and tender attachments, pure morals, and high religious feelings, she is admirably calculated for the sacred charge of watching over and training up the young, and of instilling into their tender and susceptible minds the beautiful lessons of early wisdom —of faith, truth, and charity. All nations, as they have advanced in civilization, have uniformly increased in that respect and refined attention which is due to the softer sex; and one of the most powerful minds and of the most splendid endowments has been the foremost to appreciate those superior qualities which are to be found in a gentle and unsophisticated female. The late Professor Dugald Stewart thus introduces a quotation from a well-known traveller, which affords a just and beautiful estimate of the tender disposition of woman:—"From the greater delicacy of their frame, and from the numerous ailments connected with their temperament, combined with their constant familiarity with distresses which are not their own, the sympathy of woman with the sufferings of others is much more lively, and their promptitude to administer relief, wherever it is possible, is much more eager than the generality of men. To the truth of this remark every day's experience bears witness; and, from the testimony of travellers, it appears that the observation extends to women in all the different stages of society."

TEMPERAMENTS.

There are certain conditions of the bodily frame which evidently give rise to varieties of the human constitution, and which have been called temperaments. These have been peculiarly the object of attention to Dr. Spurzheim, and others of the phrenological philosophers. As their views on this subject seem to us of a very clear order, a passage is here extracted from one of the journals devoted to that science. "Dr. Spurzheim," says the journalist, "recognises four primary or cardinal temperaments, to which he considers all individual cases may be advantageously referred, either as pure, or much more frequently consisting of two or more combined. I shall first give Dr. Spurzheim's brief Description of them, and shall afterwards enlarge upon each in detail.

"'1. The lymphatic, or phlegmatic temperament, is indicated by a pale white skin, fair hair, roundness of form, and repletion of the cellular tissue; the flesh is soft, the vital actions are languid, the pulse is feeble, and the whole frame indicates slowness and weakness in the vegetative, affective, and intellectual functions.

"'2. The sanguine temperament is proclaimed by a tolerable consistency of flesh, moderate plumpness of parts, light or chestnut hair, blue eyes, great activity of the arterial system, a strong, full, and frequent pulse, and an animated countenance; persons thus constituted are easily affected by external impressions, and possess greater energy than those of the former temperament.

"'3. The bilious temperament is characterized by black or dark hair, yellowish or brown skin, black eyes, moderately full but firm muscles, and harshly expressed forms. Those endowed with this constitution have a strongly-marked and decided expression of countenance; they manifest great general activity and functional energy.

"'4. The external signs of the nervous temperament are fine thin hair, often inclining to curl, delicate health,

general emaciation and smallness of the muscles, rapidity in the muscular actions, vivacity in the sensations. The nervous system of individuals so constituted preponderates extremely, and they exhibit great nervous sensibility.'

"The pure lymphatic temperament is characterized by a pallid complexion, soft skin, and mostly free from hairs, the hair flaxen, the pulse weak and low; a general tendency to corpulence, and a deficiency of expression in the face. Instances of pure lymphatic temperament are more rare than either of the others, and perhaps are never to be found, except amongst females and habitual invalids, when past middle age, who, from the want of exercise, have lost all trace of some other temperament which they may have possessed in youth. The mental characteristics of the lymphatic temperament are soon told; an insurmountable tendency to indolence, an aversion to exertion of either body or mind, form the hopeful traits. It is, therefore, obvious that the restraining faculties, Cautiousness and (in some of its manifestations) Secretiveness, are the only organs with the operation of which it will correspond; while all the other propensities, and the intellectual faculties, will be enervated and restrained by it.

"It has been generally supposed that the sanguine constitution is produced by the perfection or redundancy of the circulatory system: and it seems such a natural supposition, that it is difficult for us to allow its proper force to the fact, that individuals of other temperaments are frequently found who can bear loss of blood, by phlebotomy or otherwise, as well as those of sanguine constitutions, and in many instances much better. There is, however, one anatomical peculiarity which appears always to attend the sanguine. Their skin is much less disposed to transpiration than the bilious or nervous; and, in consequence, Dr. Prichard in a work lately published, considers that individuals possessing it are much better calculated to bear cold than others. The Fins, who, as a nation, are decidedly sanguine, bear extraordinary cold winters much better than their more bilious neighbours the Laplanders. Dr. Prichard adds, that as the sanguine temperament is very rare in those warmer countries, near the spot where man was first placed by his Creator, he considers the sanguine temperament as the result of a natural adaptation to external circumstances, analogous to the white hares and other animals of northern regions; but, if this is the case, it is difficult to imagine how it is that Laplanders should continue tawny, while the Fins, situated farther south, are fair. The most striking moral feature of the sanguine temperament appears to be a tendency to enjoyment of the present time, with little inclination to regret the past or to dread the future; and, in general, to look at either past or future no more than is necessary to happiness. The bilious temperament is characterized by a decided cast of features, complexion inclining to brown, dark eyes, and black or dark brown hair, with the muscles firm and well marked, and the figure, in general, expressive of vigour, with every motion significant and decided. In combination, it is frequently traced in a slight yellowness of the skin, which can only be detected by comparison, or an extraordinary acute perception of colours; for example, you may frequently find two persons, particularly ladies, the one with dark hair and eyes, the other with flaxen hair and blue eyes. The complexions of both would be denominated fair; on observing them near each other, however, it will be seen that the fairness of the dark-haired one differs considerably from the clear snowy whiteness of the sanguine.

"With respect to the nervous temperament, it manifests itself in a remarkable quickness to learn and readiness of comprehension, but little tendency to sensual gratification, and an extraordinary power of passing from one subject to another."

MAN ADAPTED TO LIVE IN ALL CLIMATES.

Man has this superiority over all other animals, that he can inhabit every different region of the globe, however extreme the degree of temperature. He is found under the scorching sun and amid the arid plains of Africa, as well as in the frost-bound regions of Spitzbergen; and he is found to live and thrive under these different extremes, not only after a gradual naturalization of ages, but can even move from one country to another, and undergo a vicissitude of climate with comparative impunity. Thus we see, even from our own country, emigrants going forth, and naturalizing themselves amid the cold regions of the north, onward to the very verge of the equator. The Esquimaux and the Canadian savage will prosecute their usual employments of the chase in a temperature where mercury freezes into a solid mass, and where even brandy congeals to ice in apartments containing fires; while the African negro, again, feels quite at his ease in a burning climate, where the thermometer in the shade ranges from 90° to 100°, and upwards. Man has an equal facility in adapting himself to the pressure of the atmosphere attendant on low or elevated situations. In Mexico, he is found living in elevated regions, from 6000 to 8000 feet above the level of the sea; and the hamlet of Antisana, in Quito, is 15,500 feet above the level of the ocean. On the contrary, we find almost all animals only adapted to live in the regions in which they are naturally found; and if they are removed from such localities, they seldom enjoy the natural period of their lives. Even the dog and the horse, the domesticated companions of man, degenerate and change their natures under extreme varieties of temperature; and the monkey tribe, which, in the structure of their bodies and in the substances on which they feed, approach the nearest to man, become sickly and diseased, and never propagate their species, when removed into any of the colder regions of the globe. In order to enable man thus to subsist in regions having such a diversity of natural productions, he is endowed with the power of feeding on and digesting every possible variety of food—he is, as compared to other animals, in respect to diet, omnivorous. We thus find the Greenlanders and inhabitants of frozen regions living almost exclusively on the fat and flesh of land and sea animals, the only species of food which the barren and ungenial nature of the climate affords, but one, nevertheless, which, from its stimulating and nourishing nature, is the very best for enabling them to live under such an extreme depression of temperature. The inhabitants of hot countries, again, will be found living on rice, fruits, and other vegetable substances, which the warm and genial soil produces in abundance, and which, from their nature, are less heating and stimulating than an animal diet. In the intermediate and temperate regions, a mixed diet of animal and vegetable food is preferred. Much discussion has arisen whether man be more a flesh-feeding or herb-eating animal; experience demonstrates that he is equally adapted to become both—that he will live on an almost purely animal diet, as well as on one purely vegetable; although, were we strictly to compare the form of his jaws and teeth, and the general structure of his intestines, with those animals that live on nuts and other fruits, and farinaceous or mealy substances, as, for instance, the monkeys, the near approach of these to the human structure would indicate to us that at all events a farinaceous diet is the most suitable to his natural organization. We thus find among all civilized nations that bread, and the grains and mealy roots, in some shape or other, have always a preponderating share in every meal. But the art of cooking, which man exercises even in the first dawnings of civilization, enables him to change the nature of his various food, and to render it more suitable both for digestion and the purposes of nourishment, and thus gives him a

wonderful superiority over all the rest of the animated world. Indeed, it is by this improved mode of preparing his food, perhaps, as much as by original strength and perfection of frame, joined to the other comforts of civilization, that he is enabled to brave the vicissitudes of climate, and to prolong his life to a longer period than the great majority of other animals.

Man has been formed with a naked skin, with the evident intention that he should clothe himself by his own labour and ingenuity. Almost all the larger and more perfect animals have a covering of hair, of feathers, or of down, which is at stated periods renewed, and in some animals in greater length and abundance at particular seasons, to suit the variations of temperature. But man can always adapt his clothing to the climate he inhabits, or to the varying alterations of the seasons; and he can at all times, by his own industry, vary or renew his suits. Man, too, builds for himself a comfortable habitation, to protect him from the inclemency of the weather, and is not contented with a burrow under ground, or the casual shelter of the woods and coppices, as is the case with the animals of the forests. It is true the architecture of bees, and some other animals, is curious, ingeniously combined, and admirably suited to their necessities; but in comparative taste, splendour, or even convenience, how far are all these surpassed by the houses, and temples, and cities of mankind! Though man is naturally defenceless and unarmed, how soon does his ingenuity enable him to obtain a mastery over the beasts of the field and forests, and furnish him with weapons of defence against all his enemies! How soon does his ingenuity enable him to improve and cultivate the soil—to drain marshes, cut down woods, level mountains—to select and cultivate the best species of grain, and the most wholesome and nourishing vegetables, for food—to invent tools and engines, by which he acquires a command over the sea and land, by which he erects bridges, constructs machinery, and launches the towering vessel upon the wide ocean! And, lastly, with what skill he constructs instruments of art and science, by which he can examine and investigate the most minute objects of nature, as well as bring within his sphere of observation other planets and other suns in the vast dome of the universe.

INFANCY.

At the moment of birth, the infant begins to exercise an independent existence, whereas before it formed a part, and was nourished by the vessels, of its parent. A general similarity takes place in the embryo growth of most animals, and the familiar instance of the chick in the egg may be taken as an example. The egg is composed of a centre part, or yolk, and of the albumen, or white part surrounding it. In this white part, a small darker speck may be seen floating, from whence the first rudiments of the chick are derived. In a few days after the hen has sat on the egg to impart to it the necessary heat, a small whitish spot will be observed, which is the first rudiments of a brain; in a few days more, vessels will be seen spreading out from a central heart, and forming a network all around; gradually an appearance of a head is seen, with indications of brain and spinal marrow; the eyeballs next are formed, then the several parts of the [illegible], the projections of the wings and legs, and [illegible] the skin and rudiments of the future feathers. During these periods of incubation, the chick has been nourished by the yolk of the egg, which has gradually been absorbed by its vessels for this purpose. At last, when its growth is perfected, and the whole contents of the egg converted into the materials of its body, the little animal begins to pick a hole in the shell, and, by repeated efforts, bursts from its shelly prison, and assumes an independent life. The infancy of man is of much longer duration, and of a much more helpless nature than the same state in any other animals. A child cannot walk till it is at least twelve months old; and even for a considerable time after that period, it has to be fed and tended with the utmost care; whereas, after a very short time, the young of most animals are able to provide for themselves; in a great many, a few minutes after birth they are able to walk about, to search for and distinguish the teat of their mother, and to pick up the food that is suitable for them; and having remained under their maternal protection for a short space, they leave their parents, and never know or distinguish them more. It is very different with the infant: during a long and helpless period of childhood, it is tended by a fond mother, who anticipates all its wants; while it, on the other hand, watches her smiles, and imitates her most minute actions; and thus a reciprocal bond of union is established, by which not only every species of knowledge and experience is acquired for the conduct of after-life, but those moral ties and affections established which constitute the great boast and solace of human society. Man proceeds from infancy to maturity by a slower and more gradual expansion of the bodily structure than any other animal, and this may be one reason of his superior organization, his greater fitness for supporting labour and fatigue, and the longer period to which his life is extended. From infancy upwards, the mental powers also gradually expand. This is also different from animals; for in them the faculty of instinct at once is perfected, and never afterwards increases or undergoes any change. In childhood, the mental faculties are constantly active, and on the alert to catch new information, inquisitive to know every thing, and imitate every gesture. The facility with which children acquire the knowledge of words, and in a few months master a language, is very astonishing, when we reflect for a moment how much time and pains it takes a grown-up person to become a proficient in any unknown language: and our astonishment will be heightened when we consider, that, in the case of children, they have not only to acquire the words and their proper applications, but even to master the articulation of sounds, with all their infinite combinations. The age of puberty, or that period when boyhood terminates and manhood commences, varies somewhat in different climates, according to their high or low temperature; the mean period may be reckoned about fourteen years; and, between twenty and twenty-five, the growth of the body generally terminates. About the age of thirty, man may be said to be in his full vigour, with his mental and bodily powers completely developed. Females arrive earlier at a state of maturity than males: in warm climates females are full grown as early as their ninth or tenth year; in more temperate regions, about their fifteenth or eighteenth year. The proportion of male children born to that of females, is as 21 to 20; there is thus a small superabundance of males; but, from various causes, it so happens that there is generally rather a superabundance of females actually existing in society. Among these causes may be mentioned, the greater hardships and labours to which men are exposed, the effects of war, and, on the whole, the longer life enjoyed by females. This regular proportion of male and female births throughout mankind in all ages, and in all parts of the world, shows the admirable design and precision of an unerring nature.

OLD AGE.

We have seen that there is, within the animal frame, a system of operations, by which a constant supply of nourishment is afforded to make up for the daily waste and decay, and that every part is constantly undergoing a renewal. To view a man in the full vigour of life, then, we might suppose that, excepting accidents, he was calculated to go on, in the course of existence, for an indefinite period. The principle of life, however, seems to

have limits set to its duration, beyond which it fails to keep in healthy motion the animal faculties. The apparatus of life is evidently destined but to last for a certain time. Old age creeps on apace, and the vital flame burns fainter and fainter, till at last it sinks in the socket, and is seen no more. The commencement of decay is perceptible even in youth itself. The child at first grows quickly, from the soft and yielding state of all its vessels; but gradually these begin to thicken and get harder—a greater proportion of earthy matter is adding to the bones. The extremities grow large, while the heart itself does not increase in an equal degree; hence the circulation becomes less and less quick, till the period of full growth. When the growth of the body can proceed no farther, a degree of fatness not unfrequently occurs. This proceeds from the superabundant nourishment produced from the food, which, from the impetus or force of the circulation being more lessened by the greater extension and resistance of the body, accumulates in the cellular textures and by the sides of the extreme vessels. In every part of the body, the induration produced by approaching age becomes conspicuous—in the bones now wholly brittle, in the skin, in the tendons, in the glands, in the arteries, and in the brain itself, which gets firmer and drier. Moreover, the arteries continue to get denser, narrower and even shut up in their minute branches. At the same time, the nerves become more and more callous and insensible to the impressions of the senses, and the muscles to irritation; thus, the contractile force of the heart, and the frequency of its pulsations, are diminished, and, of consequence, every force which impels the blood into the ultimate vessels. The quantity of humours is diminished in the denser body; the moisture which lubricates the solid parts everywhere manifestly decreases. Nor is the quantity of humours only diminished; they themselves likewise become vitiated. They were mild and bland in children; they are now acrid, salt, and fetid, and loaded with a great quantity of earthy matter. This circumstance of the superabundance of earthy matter is evident in the gouty concretions in the joints of old people, in the frequency of stone, and in the arterial tubes, and even the heart itself, being frequently converted into real bone. The rigidity of the whole body, the decrease of the muscular powers, and the diminution of the juices, constitute old age, which sooner or later comes upon all men—sooner, if subjected to violent labour, or addicted to pleasure, or fed upon a too scanty or unwholesome diet; but more slowly, if they have lived quietly and temperately, or if they have removed from a cold to a moderately warm climate. There are three obvious divisions of human life—a period of youth, including the period before the age of 30; of maturity, from 30 to 50; and of old age, commencing about the period of 50 or 60. David speaks of the age of man being, in his time, only threescore years and ten, or in rare cases fourscore years, which may be reckoned the average limit of human existence. After the period of 50 or 60 years, varying of course in different constitutions, the marks of old age begin to make their appearance. The skin becomes more lean and shrivelled; the hair changes to a gray colour, or baldness occurs; the teeth drop out, and, in consequence of this, the lower parts of the face, about the mouth and jaws, incline inwards; the muscular motions of the body become less free and elastic—this is especially seen in walking, old people generally treading on the whole base of the feet, and hence have a shuffling gait; the blood circulates slowly; the animal heat is diminished; the pulse occasionally intermits, and the whole energies of the animal frame become lessened; the eyesight begins to fail, and dulness gradually comes over all the senses; the memory undergoes a remarkable change—while recent events pass through the mind and make no impression, the occurrences of early life continually suggest themselves, and are minutely called to remembrance.

Although usually seventy years is the extreme period of human life, yet a small proportion of those born ever reach even this; a few rare instances occur where one hundred years or upwards are attained. The famous Parr lived to the age of 150 years; he married at the age of 120, and, when 130, was able to thrash, and to do every description of farmers' work. He was at last brought from the pure air and the homely diet of the country, into the family of the Earl of Arundel, in London, where he drank wine and lived luxuriously. The sudden change of diet and circumstances, however, proved quickly fatal to him. Henry Jenkins, another poor man, lived to the astonishing age of 169 years, and retained his faculties entire. Some time ago, a statement appeared of the ages of the resident pensioners of Greenwich Hospital, which contained at the time 2410 inmates. Of this number, 96 had attained to or passed the age of 80; one only was above 100; 15 were 90 or more; and 80 were 80 or upwards. About 42 of the 96 were of aged families, and in some of this number both parents had been aged. Longevity has in a great number of cases been found to be hereditary. Eighty of the 96 had been married; 79 were in the habit of using tobacco in some form or other, and 48 had drunk freely; 20 were entirely without teeth; 52 had bad, and 14 good teeth. But the oldest man in the house, who was 102, had four new front teeth within the five preceding years. The sight was impaired in about one half, and hearing only in about a fifth part of the number. Old people are not generally inclined for much exercise, nor is it suited to their stiff joints and impaired vigour; for the same reason they cannot endure much cold. Cheerful company, especially the company of the young, is peculiarly grateful to old people. Innocent amusements and recreations are also of great consequence, and the mind should be exercised in some useful or amusing pursuit. Cities, or at all events constant and agreeable society, are favourable to the condition of old age. In lonely, secluded country places, the mind sinks prematurely into a total gloom and blank, for want of sufficient stimulus and variety to keep up the vigour of thought and play of ideas. Few deaths occur from what is commonly called old age, or a gradual and simultaneous decay of all the functions. It may be said to happen when the powers gradually decay, first of the voluntary muscles, then of the vital muscles, and, lastly, of the heart itself; so that, in an advanced age, life ceases through mere weakness rather than through the oppression of any disease. The heart becomes unable to propel the blood to the extreme parts of the body; the pulse and heat desert the feet and hands, yet the blood continues to be sent from the heart into those arteries nearest to it, and to be carried back from them. Most commonly, however, some one part gives way, and disease gradually coming on, cuts off the lingering flame of existence. Thus the body, after having grown up to maturity, and flourished in its prime, sinks to the earth, and moulders into the elements of which its several parts are composed.

CONCLUSION.

The admirable structure of the body of the human being—its superiority in every respect to that of the lower animals—afford a most perfect proof of design in the all-wise Creator, and is one of the most striking instances of the impossibility of our formation being the result of blind chance. Paley, after going over a great number of examples of this kind of design in a Creator, proceeds to state that, in all instances wherein the mind feels itself in danger of being confounded by variety, it is sure to rest upon a few strong points, as per

baps upon a single instance. Among a multitude of proofs, it is *one* that does the business. If we observe in any argument (he continues), that hardly two minds fix upon the same instance, the diversity of choice shows the strength of the argument, because it shows the number and competition of the examples. There is no subject in which the tendency to dwell upon select or single topics is so usual, because there is no subject of which, in its full extent, the latitude is so great, as that of natural history applied to the proof of an intelligent Creator. Perhaps the most remarkable instances of mechanism in the human frame are—the pivot upon which the head turns, the ligament within the socket of the hip-joint, the pulley or trochlear muscles of the eye, the epiglottis, the bandages which tie down the tendons of the wrist and instep, the slit or perforated muscles at the hands and feet, the knitting of the intestines to the mesentery, the course of the chyle into the blood, and the constitution of the sexes as extended throughout the whole of the animal creation. To these instances, the reader's memory will go back, as they are severally set forth in their places; there is not one of the number which I do not think decisive; not one which is not strictly mechanical; nor have I read or heard of any solution of these appearances, which in the smallest degree shakes the conclusion that we build upon them.

The works of nature require only to be contemplated. When contemplated, they must ever astonish by their greatness; for, of the vast scale of operation through which our discoveries carry us, at one end we see an intelligent Power arranging planetary systems, and, at the other, concerting and providing an appropriate mechanism for the clasping and reclasping of the filaments of the feather of the humming-bird. We have proof, not only of both these works proceeding from an intelligent agent, but of their proceeding from the same agent; for, in the first place, we can trace an identity of plan, a connection of system, from Saturn to our own globe; and, when arrived upon our globe, we can, in the second place, pursue the connection through all the organized, especially the animated, bodies which it supports. We can observe marks of a common relation, as well to one another as to the elements of which their habitation is composed. Therefore one mind hath planned, or at least hath prescribed, a general plan for all these productions. One Being has been concerned in all."

VEGETABLE PHYSIOLOGY.—BOTANY.

GENERAL ECONOMY OF VEGETATION.

EVERY one is acquainted with the usual forms of vegetables, either as herbs or trees, for they exist in all situations suitable to their growth and constitute not only a highly ornamental covering provided by nature for the exposed surface of the earth, but, as is well known, are an inexhaustible source of nourishment to the animal races.

Plants are in the main easily distinguishable from animals, and the consideration of them falls under different sciences. Yet it is not easy to say where the animal world ends, and the vegetable world begins. The two seem to melt into each other in the class of existences called *zoophytes*, which appear a combination of both plant and animal.* We are not, however, to suppose that the highest class of plants are thus connected with the lowest or simplest class of animals, and that the organic world is consequently one continuous chain. The two systems may be rather said to be united at a point near the base of both, above which they rise side by side. Apart from this connection, plants are to be distinguished from animals by not only certain external appearances, but by the absence, in them, of what animals possess, an *internal principle* not easily described, but traceable in certain very remarkable results, namely, motion from place to place, a selection of advantageous circumstances, and a power of adapting means to ends.

Of the nature of life, or the vital principle, science does not profess to be able to give an explanation. In using the term, we only mean that power or quality resident in certain structures, by which they are enabled to incorporate with themselves those nutritive particles of matter which they require, and to reproduce structures of their own species or type. The most simple forms of life are observable in plants whose economy is limited to mere absorption of nutrition and reproduction; and it is only when we come to the link that unites vegetables with animals, that we find any thing sensitive, a nervous energy, or spontaneous locomotion. With respect to the powers of reproduction, it must be carefully impressed, that neither plants nor animals come into existence without a parentage. It was at one time supposed that some kinds of animals, as, for example, maggots, locusts, and myriads of smaller creatures, were produced from external causes alone, such as putridity, or a certain state of the atmosphere; but such notions have long been abandoned by men of science, and it is placed beyond the possibility of doubt that all animals and vegetables whatsoever, notwithstanding any mystery that may attach to their appearance, are the offspring of others of their own type.

The method of reproduction, as will be afterwards shown, is different in different plants, but, as a general principle, it may here be stated that the parent vegetable is charged with the function of liberating germs or seeds, which vegetate as soon as brought into a condition fitted for their growth. A seed is like an egg in character, for it possesses in itself that amount of nourishment which will enable it to subsist in the ground during germination, or until it draws the means of existence from the soil and atmosphere. Most kinds of seeds, being contained in husks or shells for their preservation, are able to retain their vegetative power for a long period of time, if entirely excluded from heat, air, and moisture; thus, on turning up soil that had been covered centuries ago, a new order of vegetation is always observed to arise from the long-buried seeds.

It may be further mentioned, as a provision in the economy of vegetation, that, while each species of plants is incapable of being transformed by reproduction into any other, it is possible, in some instances, as in the animal species, to produce a hybrid or mixed breed, and, with the additional means afforded by cultivation, plants and fruits may be improved in quality to a very high degree. Thus, the common sour crab, growing wild in our fields and hedges, is the uncultivated original of the different varieties of the apple. Yet, to sustain this improvement, constant culture, transplanting, crossing, or grafting are required. The plant is only improved as

* See art. ZOOLOGY.

respects itself, and if its seeds be allowed to grow up without culture in a poor soil, they will produce plants exactly resembling their humble original.

The term of vegetable existence, from the period of germination till the final decay of the plant, is extremely various: some plants are annuals, or grow but for one year or season; while others are perennial, and continue their growth from year to year; trees are among the longest lived plants, some being known to exist for upwards of two thousand years. The reproductive powers of plants are likewise very varied; but it may be stated, in general terms, that in each case nature has provided effectual means of perpetuation, either by means of roots or seeds, or by both. This power of reproduction is strikingly observable in such plants as the potato, which propagates by oviparous seeds pendant from its stalks, and by the tubers clinging to the roots in the ground. In most instances, the artificial deprivation of the seeds before they arrive at maturity, incites the reproductive powers of the roots, and they increase in bulk, or throw up new plants at a distance from the parent stem. When annuals have ripened their oviparous offspring (grain in the ear, for instance), the object of their growth is accomplished, and they forthwith droop and decay.

The development of vegetable life is greatly dependent on certain concurring agents, among which, in a particular manner, are included *heat*, *air*, *moisture*, *light*, and *soil*. Each of these agents, however, is limited to a certain range, and this range is different in different plants, so that excessive heat and excessive cold, and also the extremes of drought and humidity, are always unfavourable to vegetation generally, though not to all kinds of vegetables. Thus some mosses and other plants, whose parts are few and little developed, continue to grow in very cold weather, and even under the snow; others which generally contain much juice in their substance, but which are covered with an epidermis so compact that it resists the action of heat, and prevents any evaporation of the juice of the plant, live in situations where the heat is extreme, and during that part of the year when excessive drought renders the common vegetation as inactive as it is in polar countries during the depth of winter.

The condition of the atmosphere as respects temperature, moisture, and other qualities affecting vegetable life, is comprehended in the term *climate*. No two places at a distance from each other can be said to have the same climate, because each is subject to particular influences not affecting the other to the same degree. That district will possess the most genial climate, and be best adapted for the perfection of vegetable life, which at once lies most fair towards the sun, and is exposed to the action of refreshing rains, or is moistened in some other way. A free exposure to the sun throughout the year is equal to several degrees of latitude nearer the equator, other circumstances being favourable. The more free the exposure, the more readily will most plants blossom, and yield a rich fruit; so well is this understood in the grape countries on the Rhine, that the right bank of that river, which faces the sun, is reckoned to be much more valuable than the left, and commands a higher price for its wines.

The character of the vegetation in tropical and extreme northern and southern climates, is of the most opposite kind—the one luxuriant and continuous, the other only for a short period during summer. In the tropical regions there is always about twelve hours of sunshine, and nearly the same length of darkness; and when the air is clear, the action of the sun is generally sufficient to occasion a suspension of the powers of many vegetables, or what is sometimes called *a sleep of plants*, during the heat of the day. But, unless for local circumstances, the chief of which are alternate successions of drought and rain, there is nothing in the mere solar action which can affect vegetation there very much more at one time of the year than at another; and therefore, considered with reference to the sun alone, the vegetation there is not only generally ever-green, but ever growing, ever-flowering, and ever-ripe and in fruit.

In the extreme northern and southern latitudes, a portion of one half of the year is continual day, and a corresponding portion of the other half continual night; and when the continual day approaches, if part of the heat of the sun were not occupied in melting snow and ice, and turning into vapour the water which clouds the atmosphere and mitigates the ardour of the solar heat, the action of the sun in those high latitudes would at these times be excessive. As it is, vegetation, during the short period that it acts, is more vigorous in such parts of the polar countries as are out of the range of the cold produced by melting snow or ice, than it is in any other part of the world; and even in Lapland, we have the expansion of the bud, the blowing of the flower, the ripening of the fruit, and the preparation of the new bud, in little more than half the time in which these operations take place in the temperate climates. This state of things requires a suitable character in the vegetables placed in those countries—they must be capable of withstanding equally the ardour of summer and the rigour of winter. For this purpose, such vegetables as stand exposed to the air at both seasons, form complete buds, encased in a hybernaculum, composed of a number of scales of a resinous or gummy consistency, with thin strata of dry air between them; and buds so shielded are proof against the utmost severity of cold. The more lowly plants of such places are defended by the snow which covers the ground; and thus, though the action of the vegetable world is limited in its annual period, and also in the number of species in which it is displayed, it is as perfect in its system, and as secure in its continuance, as in the tropical regions. Between these extremes, there is a regular gradation; and taking that and local observation along with us, we are in possession of at least the elements upon which a geography of plants may be formed.

While heat, variously modified, serves as a prime exciting cause of vegetable life, air and moisture, or water, are elements in which the vegetables feed and exist. The soil in which the plants have their roots, and the atmosphere in which their branches and leaves flourish, are the great laboratories of nature, whence these elements are drawn. To understand properly how plants derive nourishment from these sources, it is necessary to appeal to *chemistry*, or that branch of science which recognizes the elementary properties of matter. The following are a few leading principles, briefly stated:—

"The substances which constitute the principal mass of every vegetable are compounds of carbon with oxygen and hydrogen in the proper relative proportions to form water. Woody fibre, for example, is composed of such compounds of carbon with the elements of water. In another class of substances containing carbon as an element, oxygen and hydrogen are again present; but the proportion of oxygen is greater than would be required for producing water by union with the hydrogen. The numerous organic acids met with in plants belong, with few exceptions, to this class. A third class of vegetable compounds contain carbon and hydrogen, but no oxygen, or less of that element than would be required to convert all hydrogen into water. These may be regarded as compounds of carbon with the elements of water and an excess of hydrogen. Such are the volatile and fixed oils, wax, and the resins. The juice of all vegetables contains organic acids, generally combined with inorganic bases or metallic oxides; for these metallic oxides exist in every plant, and may be detected in its ashes."*

* Liebig's Organic Chemistry.

Nitrogen also forms a portion of most plants, being an important ingredient in the substance called gluten, or the starchy material of farinaceous vegetables. It is chiefly drawn in the form of ammonia from the soil to which animal manures have been applied. In general, carbon is the fundamental and principal element in plants, and this is derived chiefly from the atmosphere. The carbon exists in the atmosphere in the form of carbonic acid, or in a state of union with oxygen; and therefore, before appropriating the carbon, plants must necessarily decompose the atmosphere. This process is actually performed by the vegetable kingdom. Plants possess the power of separating the carbon of the carbonic acid from the oxygen, and, seizing upon the carbon, return the oxygen to the atmosphere.

The process of decomposition and appropriation is performed by the leaves and other green parts of plants, these constituting the breathing apparatus. But, for the performance of this remarkable chemical action, aid from the sun's light is necessarily required. While vegetables are in a considerably darkened shade during the day, and in darkness during the night, carbonic acid is accumulated in all parts of their structure; and the assimilation of the carbon and the exhalation of oxygen commence from the instant that the rays of the sun strike them. As soon as a young plant breaks through the surface of the ground, it begins to acquire colour from the top downwards, and the true formation of woody tissue commences. Plants thus improve the air by the removal of carbonic acid, and by the renewal of oxygen, which is immediately applied to the use of man and animals.

The growth of plants, and their transformation of elementary properties in the soil and atmosphere, must hence be regarded as a protracted and various process in the chemistry of nature, proceeding on fundamental laws. In order that the process may not be defeated, pure atmospheric air, and also the sun's light, must be allowed in their proper proportions, independently of pure water. The air best adapted for robust vegetable growth is that of an ordinary density, near the sea's level. Generally speaking, the more elevated the station of the plant is, its action is the less, because the air is the less dense, therefore colder, and is understood to have greater evaporative power; but mountainous countries are generally much better supplied with humidity than plains; and therefore the dwarfed growth of plants in such situations must be considered as resulting much more from their diminished action than from any excess of evaporation. Hence, as we ascend the slopes of mountains which are of sufficient elevation for having their summits covered with perpetual snow, we find upon them plants resembling those of a succession of latitudes, gradually getting colder than the mean temperature of that which answers to the level of the sea, in the same latitude as the mountain. So that, upon very lofty mountains near the equator, the Andes in upper Peru, for example, we meet with something resembling the succession of plants in the whole quadrant, from the equator to the pole. But it is a resemblance only, and not an identity; because, although it be possible to find upon the side of such a mountain places which have the same mean temperature for the year as is found in every parallel of latitude, yet both the daily and the seasonal distribution of the sun's action are very different; and it necessarily follows that the habits, and even the characters, of the vegetables are equally so.

Humid air supplies some vegetables with all the nourishment which, from their situations, they can possibly obtain; and therefore we may conclude that it is capable of affording some nourishment to every vegetable. But the air also acts as a drain upon vegetables, in removing out of their structure a portion, and sometimes a very large portion, of that water which is necessary for the purposes of growth; and in proportion as the air is more humid, it must perform this function less perfectly. We must therefore suppose that there is a certain degree of moisture, and of evaporative power jointly, in the air, which is best adapted to the healthy action of plants, but what this is must depend upon the nature of the plant, and must therefore be ascertained by direct observation. Indeed, this is one of the circumstances which tends to the local distribution of the different kinds of plants, as we find them in a state of nature; but, like the others, we cannot so separate it from co-operating causes as to obtain the law of its action. There is one other circumstance connected with the air which is worthy of notice, and that is, whether it be more generally stagnant or in motion. It is perfectly evident, that the action of stagnant air upon a plant must be every way less than that of moving air, whether we suppose the action to be of one kind or another; and therefore, up to a certain point, motion in the air must be favourable to the growth of vegetables. Of this there have been proofs by direct observation, in the same part of the world; and when we examine different parts of the world, we find proofs which are much more striking: thus, for instance, the trade wind of the Atlantic sets constantly against the shores of Brazil and Guinea, and up the valley of the Amazon, until its motion is gradually destroyed by the dense mass of vegetation over which it passes.

The Oriental isles, and the southern part of the Malay peninsula, are in like manner exposed to a constant current of the air; and those two regions are, in respect of the number, the variety, the beauty, and the activity of their vegetable productions, the very gardens of the two hemispheres. Even when the current of air is an alternating one, the return of which is actually unfavourable to vegetation, such a situation is still highly favourable upon the whole. Of this we have striking examples in the valley of the Mississippi, the Malabar coast of India, and even in the British islands, and, generally speaking, along the whole of the west coast of Europe, where the advantage is not counteracted by some local cause.

Winds are therefore to be considered as performing an important part in the economy of nature. From northern and southern latitudes, where there is a small supply of sun's light during winter, with weak vegetation, and consequently a superabundance of carbonic acid in the atmosphere, the winds convey the deleterious material to tropical regions, where, by means of the brilliant sun's light and strong vegetation, it is readily and profitably consumed. Streams of wind in a contrary direction, or from the equator to the poles, in the same manner bring to us the superabundance of oxygen produced from tropical plants. While heat, moisture, air, and light, variously modified in the multifarious climates on the globe, produce the extraordinary diversity of vegetable growth, another set of circumstances affect the life of plants, and these relate to the nature of the soil in which they are placed. Although properly belonging to GEOLOGY, we shall present a short exposition of what soils usually consist.

The soil is mainly composed of particles which have been disengaged by various means in the course of time from the rocks on which it rests. In some instances, and more particularly on hills, it is composed chiefly of pulverized materials from the rocks immediately at hand or beneath; but in many others, the pulverized matter has been washed down from high into low grounds, or transported by floods from great distances. The action of the air and water on rocks in dissolving them, and the power of the latter element in transporting the disengaged particles, are the principal causes of the present arrangement of the soil.

Notwithstanding the different appearances which the earthy covering of the globe exhibits, it is composed

almost entirely of four substances, formed by an original union of simple elementary matters. These four substances, washed at a former period from rocks, and more or less compact from influencing circumstances, are called primitive earths, and are named *clay*, *sand*, *lime*, and *magnesia*. Clay is variously named alumine or argillaceous earth; sand is sometimes termed silex, silica, or silicious earth; and lime is commonly called calcareous earth. The distinctive characters of all these substances are well known. Besides these four earths, which either in a soft or hard state constitute the soil and subsoil, the upper stratum or mould contains the relics of decayed vegetable and animal substances, also certain metallic bases, generally oxide of iron. The particles of decayed vegetable matter, sometimes termed *humus*, and known as food for new vegetation, are understood to be in reality a deposit of carbon gained by plants from the atmosphere. Ammonia, as already said, is also an ingredient in fertile soils.

The whole of these circumstances, modified in a variety of ways, influence vegetable growth, and require to be studied by the cultivator of plants. It has long been remarked that plants have a tendency to exhaust the soil in which they grow, and to exchange their situation for one more suitable to their wants. The following propositions on this subject have been laid down by two eminent French chemists, Yvart and Pielet:—1. That every plant has a natural tendency to exhaust the soil; 2. That all plants do not exhaust the soil equally; 3. That all plants of different kinds do not exhaust the soil in the same manner; 4. That all plants do not restore to the soil the same quantity nor the same quality of manure; 5. That all plants differently affect the growth of weeds. From these fundamental principles the following conclusions are drawn:—1. However well a soil may be prepared, it cannot long nourish crops of the same kind in succession, without becoming exhausted; 2. Every crop impoverishes a soil, in proportion as more or less nutritious matter is restored by the plant cultivated; 3. Perpendicular rooting plants, and such as shoot horizontally, ought to succeed each other; 4. Plants of the same kind should not return too frequently in a circle of cropping; 5. Two plants equally favourable to the growth of weeds ought not to succeed each other; 6. Such plants as greatly exhaust the soil, as grains, should only be sown when the land is in good heart; 7. In proportion as a soil is found to exhaust itself by successive crops, plants that are least exhausting should be cultivated. It may be added, that a successive change of crops has a tendency to destroy noxious insects, as those which are produced by one crop cannot be supported by another of a different description.

Nature, when unassisted, invariably makes an effort to change the crops of plants. When a forest in North America is burnt down by accidental fires in the summer season, trees of quite a different kind spring up from long concealed seeds in place of those which have been destroyed. When, in ordinary circumstances, one kind of plant has exhausted the soil in its neighbourhood, it pushes its roots to as great a distance as possible in quest of food, and there sends up shoots, while a new race of plants grows upon the spot which it has vacated. The seeds of certain plants, such as the dandelion, thistle, &c., are furnished with downy wings, by which they are rendered buoyant, and carried away from the parent plant by the slightest wind. The seed-vessels of other plants, such as the whin, when ripe, burst open with considerable force, and scatter the seeds to some distance from the place where the old plant grows. In these, as in a thousand other circumstances, we find that one of nature's great primary laws is that of perpetual change—an alteration from one condition and appearance to another, in endless succession and variety. In the artificial cropping of the ground, the farmer, for his own sake, is impelled[*] to take a lesson from nature, and to study what species of plants he can most advantageously produce in succession from his fields. Hence, *ration*, or the *rotation of crops*, as it is differently termed, is a matter of first importance in husbandry.

A long course of experience and scientific inquiry have proved that all soils are capable of being improved by art, and supplied with restoratives suitable to the demands of the proposed vegetation. These artificial restoratives receive the name of *manures*, and are commonly in the form of animal excrements, these containing ammonia, one of the bases of vegetable structure, in greater or lesser abundance. Some idea of the powers of restoration from substances of this nature in a due state of putridity or decomposition, is obtained from the fact, that, from every pound of ammonia which evaporates, a loss of sixty pounds of corn is sustained. Potash, soda, gypsum, and other materials, also constitute manures, or bases, whence are drawn fertilizing principles in vegetation.*

CLASSIFICATION OF PLANTS.—LOWER FORM OF VEGETATION.

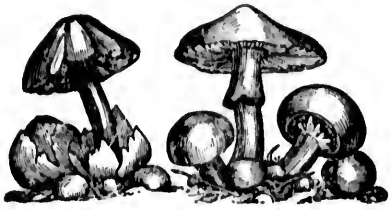
According to the latest researches of naturalists, about 80,000 plants of distinct specific forms have been discovered, but it is believed that as many more remain to be made known, and additions to the list are constantly taking place. For the sake of order and classification, as in the case of the Animal Kingdom, all plants, from the lowest to the highest forms of vegetation, are arranged in a progressive series of groups or families, the members of which possess a common resemblance, or are otherwise allied in character. This very necessary classification belongs to Botany—a term from the Greek, signifying a plant—and an outline of the plan adopted is given in the latter part of the present article. Here it is only necessary to mention, that, according to the Linnean system, the whole Vegetable Kingdom is arranged in two grand divisions, namely, plants having visible flowers (*Phænogamia*), and plants having no visible flowers (*Cryptogamia*). The whole are also divided into classes, orders, genera, and species, each species containing a number of varieties.

The lowest forms in which vegetables make their appearance are those of the *cryptogamia*,† among which are included the *fungi*, the *musci* (mosses), *hepaticæ* (liverworts), *lichines* (lichens), *algæ* (seaweeds), and *filices* (ferns), &c. The fungi, which may be placed at the very bottom of the vegetable scale, are observable in a great variety of forms, and, among others, mushrooms, toadstools, puff-balls, the fungous dry-rot, fermentation, mildew, and mould. We may take the last mentioned as about the lowest in the group. Mould, as most persons are aware, makes its appearance on the surface of various familiar objects—decaying paste, fruit-preserves, cheese, and old shoes. It never appears on any thing which is new or fresh, but is always a harbinger of decay, and may be considered a first step towards the decomposition of the substance into its constituent elements. How vegetation should appear in so secluded a situation as the inner cracks in cheese, or in a jar of preserves placed carefully away in a cupboard, or on the leather of an old boot in the remote corner of a bedcloset, is at first sight incomprehensible; but a consideration of the reproductive powers of fungi at once explains the circumstance. The whole of the fungous tribe possess the most extraordinary productive powers.

* To students who desire full information on this highly important branch of vegetable economy, and particularly all who are to be engaged in agricultural pursuits, we recommend the careful study of "Organic Chemistry," by J. Liebig: to be had of G. H. Zieber & Co., Philadelphia.

† A term signifying *hidden marriages*, or, by a liberal interpretation, plants whose means of reproduction are concealed, not obvious, as in the case of flowers.

Instead of propagating by the ordinary and slow process of elaborating and throwing off seeds, they increase by the dispersal of their entire substance. Every particle in their mass is a germ, or technically a *spore*, which, though smaller in bulk than a particle of fine dust, and



Fungi.

generally so minute as to be invisible to the naked eye, is the embryo of a new plant, and will develop its powers of vegetation as soon as placed in an appropriate situation for its growth. In this manner, a toad-stool, having performed its office and exhausted its means of nourishment, shrinks, dries, and dissolves in millions of atoms, which, being liberated and floated away in the atmosphere, are deposited in every imaginable situation. Some are inhaled into the lungs of animals, while others enter into the fabric of trees and herbs, and, in short, they find admission into every exposed and penetrable substance. There is, however, a distinct principle in fungous vegetation, that it can develop itself only in decaying bodies. Decay, or liability to decay, is necessary for its fructification; and when this condition ensues, and other circumstances are suitable, the embryo expands and rises with surprising rapidity into notice.

A very remarkable kind of fungous vegetation is known to make its appearance in wine cellars, the substance which supplies the growth being the vapour from the wine in the casks or bottles. If the cellar be airy and dry, the vapour escapes, and no fungous vegetation is manifested; but if it be somewhat damp and secluded from air and light, the fungous growth becomes at once apparent. Round every cork a mould-like vegetation will exhibit itself, and the vapour from the casks rising to the vaulted roof, will there afford nourishment to great festoons and waving banners of fungi. In the wine vaults of the London docks, this kind of vinous fungi hangs like dark woolly clouds from the roof, completely shrouding the brick arches from observation. On a small piece being torn off and applied to the flame of a candle, it burns like a piece of tinder. Should wine escape from a cask in a moist and ill-ventilated cellar, it will altogether resolve itself into fungi of a substantial kind. A circumstance of this nature once came under the notice of Sir Joseph Banks. Having a cask of wine rather too sweet for immediate use, he ordered that it should be placed in a cellar to ripen. At the end of three years, he directed his butler to ascertain the state of the wine; when, on attempting to open the cellar door, he could not effect it, in consequence of some powerful obstacle. The door was therefore cut down, when the cellar was found to be completely filled with a firm fungous vegetable production, so substantial as to require an axe for its removal. This appeared to have grown from, or to have been nourished by, the decomposed particles of the wine, the cask being empty and buoyed up to the ceiling, where it was supported by the surface of the fungus.

The disease called rust, which affects grain in the ear, particularly in moist seasons, is well known to be a fungous vegetation, proceeding from germs which had previously existed in the substance of the plants. In a dry season, and on a favourable soil, rust rarely makes its appearance; certain conditions are necessary for its development, and it is to obviating these that the farmer must look for exemption from this destructive malady in his crops. It is now placed beyond a doubt that rust arises in many cases from the over-manuring of fields; the grain is overloaded with nourishment, and the dormant fungi, brought into a condition of development, speedily show their destructive properties. The tendency to rust may be neutralized by steeping the seeds before sowing in a corrosive solution, or strong brine, but the same end may be better secured by not over-manuring, or by a free use of saline manures. Salt, as is well known, is an enemy to corruption, and, when applied to the soil, it prevents the injury which plants receive from the fungus tribe. Skilful agriculturists are now fully aware of these facts.

Offensive in appearance as nearly all fungous vegetables are, and injurious as they may sometimes be to the crops of the husbandman, they perform a highly useful office in creation. Existing only by the absorption of fœtid exhalations, and rapidly depriving them of their insalubrious properties, they execute duties analogous to those of certain tribes of insects (maggot-flies, for instance), and in this respect have been appropriately associated with these animals as the "scavengers of nature." On this point in their economy, a naturalist observes as follows:—

"The peculiarity of their agency consists in their power of suddenly multiplying their numbers, to a degree which could only be accomplished in a considerable lapse of time by any larger beings; and then as instantaneously relapsing, without the intervention of any violent disturbing cause, to their former insignificance. If, for the sake of employing on different but rare occasions a power of many hundreds or thousands of horses, we were under the necessity of feeding all these animals at a great cost in the intervals when their services were not required, we should greatly admire the invention of a machine, such as the steam-engine, which should be capable at any moment of exerting the same degree of strength, without any consumption of food during the periods of inaction; and the same kind of admiration is strongly excited when we contemplate the powers of insect and fungous life, in the creation of which nature has been so prodigal. A scanty number of minute individuals, only to be detected by careful research, and often not detectable at all, are ready, in a few days or weeks, to give birth to myriads, which may repress or remove the nuisances referred to. But no sooner has the commission been executed, than the gigantic power becomes dormant; each of the mighty host soon reaches the term of its transient existence; and when the fitting food is used in quantity, when the offal to be removed diminishes, or fewer of the spores find soil on which to germinate; and when the whole has been consumed, the legions before so active all return to their latent unnoticed state, ready, however, at a moment's warning, again to be developed; and, when labour is to be done again, again to commence their work either in the same districts, or to migrate in clouds like locusts to other lands. In almost every season there are some species, but especially in autumn there are many, which in this manner put forth their strength; and then, like the spirits of the poet, which thronged the spacious hall, 'reduce to smallest forms their shapes immense.'"

It will now be understood that mould is a fungous vegetation, produced by a previous deposit of germs in the tissue or on the surface of the object on which it grows. The proximate cause of its development is generally damp, and, without this condition, the embryo remains in a dormant state. Still, it may be asked, how cheese happens to have green mould at its very centre: the reply is, that the fungous germs floating in the atmosphere had various opportunities of finding admission into this article of diet.

They may have been deposited on the grass of a field; the grass was eaten by the cow, and the germs were so lodged in the milk; or, what is more probable, the germs fell upon the curd, and there lay concealed till a certain dampness in the cheese brought their vegetative powers into operation. It is well known that the exposure of curd for a day to the atmosphere will have the effect of producing cheese liable to mould. The mouldiness of Stilton cheese is produced, we believe, by practising this device. Those who wish to make sweet cheese, not readily liable to mould, should avoid exposing the curd to the atmosphere.

A fully more surprising instance of fungous vegetation in a secluded situation, is that which occurs in the fermenting of yeast, and other substances. Fermentation is, in a respect, a chemical process, forming a first step towards dissolution, but the action is also vegetative. The whole mass of matter gradually assumes the condition of active vegetative growth. The fungous germs which had been incorporated in the material, begin to live and expand, each being a plant which grows and gives rise to new plants of the same species. A popular author observes of fermentation at this stage in its progress—"If a small portion of the fluid be examined at intervals with a powerful microscope, it is seen that each of the little vesicles contained in it puts forth one or more prolongations or buds, which in time become new vesicles like their parents; these, again, perform the same process: so that within a few hours the single vesicles have developed themselves into rows of four, five, or six. This is not the only way, however, in which they multiply; for sometimes the vesicles are observed to burst, and to emit a number of minute granules, which are the germs of new plants, and which soon develop themselves into additional cells. By the time that five or six vesicles are found in each group, the fermentation is sufficiently far advanced for the purposes of the brewer; and he then takes measures to check it, by which the vegetation of the yeast is suspended. The groups of vesicles then separate into individuals resembling those which first constituted the yeast; and thus, a greatly increased amount of this substance is the result of the process."*

We may learn from these observations that the germs of fungi, necessary to produce dry rot, mould, fermentation, and other species, are dispersed throughout all organic matter. Every thing we eat, drink, taste, or which ministers to our wants, contains the germs of fungi, and all that is required to bring them into visible operation are certain conditions of decay, heat, and moisture.

It is generally allowed that the algæ embrace the most minute forms of vegetation (not of a fungous character). One of those forms is that which has vulgarly been called *red snow*, or *bloody rain*. A shower of red-coloured rain or snow is by no means a rare phenomenon in the northern parts of Europe, or within the arctic circle; and the tinging matter, which has been accurately examined, is found either to proceed from the incorporation of vegetables or animalcules, both too small to be seen by the naked eye. The colouring vegetable matter is an aggregation of an infinitude of plants either sucked up by a water-spout into the atmosphere, or overtaken while carried along by the winds, and brought down by the falling drops. On the stones by the side of brooks, we may sometimes observe a similar reddish colouring matter, which, if not caused by metallic ores, will generally be found to be a primitive kind of vegetation. When touched, it feels slippery, and on examination by a microscope, it is observed to consist of myriads of plants, each consisting of a small vesicle or globule, which, on arriving at maturity, expands, bursts, and liberates plants of its own species. This excessively humble plant is classed with algæ, as being the nearest to it in character, although these plants are for the most part of a large size, and grow principally on rocks in the sea.

The object which nature has in view by the germination and dispersal of the algæ, mosses, and lichens, is clearly that of preparing the way for a higher order of vegetation. It cannot possibly escape our observation, that the tendency to vegetate is a power restless and perpetual. We hew a stone from the quarry and place it in a damp situation, on the ground or in a wall, it is all the same which, and shortly a green hue begins to creep over it. This is the commencement of a vegetable growth, produced by germs floated in the atmosphere, and being attached at random to the stone, have been brought to life through the agency of the moisture. Other stones equally exposed, but in dry situations, have also received a clothing of these germs, but circumstances not being suitable, they have not been developed: give the moisture, and they will immediately appear. We hew another stone from the quarry, and build it into the pier of a bridge just within the surface of the water. Shortly, the same kind of green algæ will appear; but the wet being in greater abundance and more continuous, the growth will become more luxuriant. Instead of the simple green hue, we have the addition of long filaments resembling green hairs, which float and accommodate themselves to the water around. This kind of plants, which are known to naturalists as the confervæ, propagate, like others of the cryptogamia, by a rupture of their tissue, and the liberation of germs, which become plants of the same species. Of course there cannot be a doubt that all open ponds, lakes, and running waters, abound in germs capable of producing this green filamentous vegetation.

The inquiry may perhaps here be made—supposing that nature designs this species of growth to be a forerunner of a higher order of vegetation, how is that result to be brought about? To answer this, we must take an expansive view of the subject, and not confine ourselves merely to one department of science. Nature is incessantly working out vast ends by humble and scarcely recognisable means. It seems to be a principle that nothing shall remain stationary or unchanged. The whole surface of our planet is every instant altering in its features. Mountains are being washed down into the plains, rocks are mouldering into soil, the sea is filling up at one place and encroaching on the land at another, and water-courses are constantly shifting their outlines. The duty of filling up seas, ponds, lakes, and rivers, is consigned to divers means within the animal and vegetable economy, and one of these is the growth of algæ and other aquatic plants. Take a pond of water, and shut off its means of supply from rivulets and springs, and then observe what an effort nature will make to fill it up. The sides and bottom become speedily covered with a luxuriant crop of confervæ; other plants, which grow only in water, begin to make their appearance, their seeds being wafted thither by winds; at length the superficial matting of herbage is able to support the weight of birds, grass grows, there is alternate vegetation and decay, and finally the pond is filled up. This routine is observable in many small lakes which are fed by weak springs, and, except for an artificial clearing out occasionally, they would in a short time become dry land. What, indeed, are the extensive peat-mosses but lakes and pools choked with vegetable matter, which remains in a half-consumed condition. Thus we see that the green hair-like ooze which grows upon stones in the water, humble and apparently insignificant as it is, performs a distinct part in creation necessary to work out the important designs of Providence.

The algæ are the vegetation of the deep, and grow as immense forests in the rocky bed of the sea, where they furnish food for animals, and assist in filling up and altering the channels. On being decomposed, they afford an alkali to soap manufacturers, and are exceedingly useful

* Popular Cyclopædia of Natural Science.

in furnishing iodine, a substance which is now used in medicine for reducing glandular swellings.

Algæ.

Lichens are a numerous family of plants, and put on various appearances. Their usual aspect is a dry scaly crust of a grey or yellow hue, and their appropriate place of growth is on old walls, gravestones in churchyards, and rocks; they are also seen growing on the trunks of old trees. Their structure is very simple; each plant consists of a membranous scale, or *frond*, divided into lobes, and they cling to the object on which they grow by means of small filamentous roots, which insinuate themselves into the most minute crevices. Growing usually as parasites on some kind of hard substances, they derive their nourishment exclusively from the atmosphere, and only require pure air and sun's light, with a fair proportion of moisture, for their subsistence. Their whole economy being rudimental and simple, they are capable of living at great altitudes on mountains, where the air is too thin for the growth of the higher orders of plants; on this account the lichens are found flourishing beyond the limits of every other kind of vegetation, even to the very verge of perpetual snow. At these great heights they cannot be said to be of any service in preparing soil for plants of a superior order, but they at least help to bray down their rocky beds, and level mountains with the grounds beneath. From the atmosphere they have the power of secreting oxalic acid, which, acting chemically on their rocky base, causes small hollows sufficient to gather rain from the atmosphere; and the moisture finding its way into crevices, the rock is split by frost, and in time moulders into fragments. The tenacity with which they adhere to their situation, renders it difficult to scrape them from stones by art; but as light and air are essential to their subsistence, they may be easily removed by covering them over for a short time with a turf or quantity of earth. Gravestones, whose inscriptions have been obliterated by lichens, may by this expedient be completely cleared from their growth. Liverworts are a superior kind of lichens, possessing leafy fronds, and expanding to greater dimensions; they also seem to grow best in situations somewhat damp.

Lichen.

In our comparatively mild climate, we have little experience of the lichenous family of plants which appear to flourish best in those cold regions of the globe where almost every other living thing would perish. In the extreme northern parts of the American continent, there are found on the rocks a kind of lichen called by Canadian voyageurs *tripe de roche*, from its resemblance, when boiled, to tripe, and in which cooked state it forms a meal when more nutritious food is wanting. Another kind, called reindeer moss, is common in the arctic regions, where it grows to a foot in depth, and is the chief resource of the reindeer. The celebrated Iceland moss is also abundant in these regions, and may be reduced by cooking to a fine mucilaginous substance.

The name *moss*, however, is misapplied to these and most other lichens and liverworts. Mosses are plants a stage higher in structure and functions, and generally require a greater quantity of heat, air, moisture, and soil for their growth. With moss, plants commence the rudimental characters of root, stem, branches, and leaves. Mosses have a bright green colour, a proof of the activity of their leaves or breathing apparatus; and their slender stems, with minute feathery branches, are among the most elegant structures of vegetable growth. Mosses fructify in a peculiar manner. On examining a soft green mass of moss, we may at certain seasons observe a forest of small thin stalks raised considerably above the general level. These are the seed stems. At the top of each is a small pouch containing the seed, and covered over with a lid or veil, which drops off when the fructifying matter is ripe, and suffers it to escape. By being elevated in this manner, and freely exposed to the wind, means are afforded of scattering the seeds over the recumbent moss, and for their being blown to places at a distance. The object seems to be, to keep up an active fresh vegetation on the surface of the moss, while a corresponding decay is going on beneath, and adding deposits of new soil. The whole economy of the plant is beautiful, and it will be remembered that it so much affected the feelings of Mungo Park, in one of his moments of desolation in the wilderness, as to inspire him with an energy sufficient to carry him over his difficulties.

Moss.

HIGHER FORMS OF VEGETATION.—PHYSIOLOGICAL STRUCTURE.

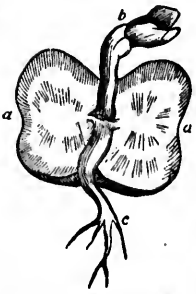
From the humble class of cryptogamous plants, we ascend to the second great division in the vegetable kingdom, called the PHÆNOGAMIA, or plants which flower, and possess the attributes of distinct seeds, roots, stems, branches, and leaves.

Seeds.—A seed, upon being placed in the ground, in due time sends forth two shoots, one ascending and forming the stem, and the other descending and forming the root. The annexed figure gives a representation of the germination of a dicotyledonous or two-lobed seed: *a a* the seed lobes, *b* the leaf-germ, *c* the root spreading into fibres.

The time required for vegetation varies much in different species; thus the mustard takes little more than one day, whilst the rose, the hazel, &c., require two years. When a seed begins to germinate, it enlarges until it bursts its shell. As soon as the embryo stem has reached the open air, its leaflets are expanded, and begin to perform all the functions of leaves.

Roots.—The root (*radix* in Latin) is commonly defined to be that part of a plant which attaches itself to the soil where it grows, or to the substance on which it feeds, and is the principal organ of nutrition. Exceptions to this definition occur, as in the case of some vegetables which grow floating loosely in water, as duckweed and others, having no root at all. As the nourishment of a plant is derived from the earth, the root is that part which grows in an opposite direction to the stem, and is buried in the ground. A root consists of several parts, which have been called the body or *caudex*, the collar or life-knot, the branches or radicles, when such exist, and the

rootlets or small fibres, which seem to be indispensable in all roots. The body of the root assumes various forms; it may be globe-shaped, as in the turnip; conical or tapering gradually from the collar to the attenuated fibre, as in the carrot; fusiform, or tapering at both ends, as in the radish; this latter may be abrupt, that is, as if the lower end had been cut off, exemplified in the devil's bit scabious; fibrous, or consisting of small thread-like fibres,



which proceed directly from the collar, as may be seen in most grasses; tuberous, when the fibres bear globe-shaped bodies filled with starchy matter, as in the potato; fasciculated, when the fibres swell slightly in the middle; bulbous when the round lobe consists of coats or layers, such as may be seen on cutting an onion across. A corm is similar in form to a bulb, but is not composed of layers; a palmated root consists of a number of oblong tubers proceeding from the collar like the fingers from the body of the hand, as in the dahlia. Tuberous roots, such as the potato, are considered by some modern botanists as merely underground stems, from the circumstance of their having eyes, or buds, from which branches will spring. The crown, collar, or life-knot, as it is variously called, is that part which lies between the stem and the root. It is the most essential portion of the whole; for, if it be removed or seriously injured, the plant will inevitably die; whilst the small fibres or rootlets, although an essential part of a plant, may be destroyed at pleasure, so long as the crown remains, for it readily reproduces them. When it is of a slender make, as the seed form, it dries up and the plant soon dies. Such plants are termed annuals, as the poppy, mignonette, and others. The crown, however, in some cases, by proper treatment, may be rendered so strong that annuals can be brought to grow two years, when they are termed biennials; or for three years, when they are called perennials. The fibrous root consists of a quantity of long thin fibres, of different lengths and thicknesses, and having still finer ones springing from them, as in the case of wheat, barley, and most grasses. These small fibres or rootlets bear a resemblance to the branches and leaves of the stem. Fibrils consist of a central fasciculus of vessels, enclosed by a cellular cortex and cuticle. Like the leaves of trees that are not evergreen, they are annually produced; in some cases dying and falling off like leaves, in others becoming thicker, harder, and forming radicles or root-branches. The spongelets, as they are called, which take up nourishment from the soil, are situated at the extremity of these rootlets. They are minute spongy bodies, of an oblong shape. We have an instance of rootlets falling off like leaves in those arising from bulbs—such as the lily, the onion, the tulip, &c., which are pushed off and perish like leaves by buds containing the rudiments of the rootlets to be evolved next season.

Roots have a remarkable tendency to grow downward, or in the direction of the earth's centre, and, from experiments, it is likely that this tendency is an effect of gravitation. The precise direction, however, is very much influenced by the condition of the soil. Both root and rootlets extend as if in quest of food, and this will penetrate sideways or obliquely to great distances. When plants are by any means prevented from fructifying by seeds, they almost invariably increase by extending their roots, from distant points of which new plants will spring up

The stem or stalk.—When a plant shows itself above the ground it evidently manifests a strong tendency to the light. Light, in fact, is essential in bringing it to maturity, and in giving the green colour to its leaves The stem, with a few exceptions, is always above ground, and is the perpendicular pillar from which various lesser growths, such as branches, shoot off laterally. "The stem," says Rennie, "is divided from the root by the part called the crown or collar. The space between the collar and the first leaf or bud is termed the bole; but the great body of a stem is called the trunk. The stem of grapes, corn, and reeds, is termed the straw; the stem of palms, ferns, mushrooms, and sea-weeds, is termed the stalk; the stem of such flowers as the primrose, the daisy, the snowdrop and the lily, is termed the scape, though flower-stalk is certainly better; the running stem, as in the strawberry and cinquefoil, is termed a runner; a shorter runner that does not root, as in the house-leek, is termed an offset; a longer one that does not root, as in the cucumber, a violet; and a small stem proceeding laterally from a root or stool, a sucker."

The stem, it will be observed, assumes many forms and characters as to bulk, structure, position, place, and duration. It appears as a tuber (*Gladiolus*, 1), a bulb (the onion, 2), a scape (*Dodecatheon*, 3), a culm (*Arundo*, 4), or as a woody column (the palm, 5). It varies in size from that of a bristle to a trunk of many feet in diameter.

When a trunk bears permanent or perennial branches, the plant is termed a tree; when permanent branches arise, not from a trunk, but from the root, the plant is termed a shrub; when small and much branched, a copse shrub; when furnished with woody branches that are not permanent, as in the tree mignonette, it is termed an under-shrub; and when the whole stem is not woody, and dies down every year, at least as far as the crown of the root, the plant is termed an herb; when a trunk is formed like the underground stem of the iris, of the hardened bases of leaves which have withered and fallen, and is not taper, but all of one thickness, giving off no branches, as in the date and cocoa, the plant is termed a palm.

Buds, which have various forms, but are generally oval or roundish, consist of the young shoots either of leaf, flower, or twig, and proceed from what is called the axil of a leaf. They are usually formed either early in summer or in autumn, and are so contrived as to preserve from injury the delicate foliated structure within. The outside is composed of tough scales, which are frequently covered with a gummy resin, and they are internally kept warm by a downy substance interposed between the leaves. Buds are in most respects like bulbs, the scales being composed of cellular tissue, with distinct fasciculi running through it. This separation of the vascular fasciculi is the feature which distinguishes these scales from leaves. The inner scales perform the functions of leaves, until these are perfected and fully expanded, when they drop off; but in some trees, as in the apple and the almond, they are converted into leaves; whilst in others, as the rose, they are converted into the pellicles, or foot-stalks of the real leaves which spring out

of them. When the central part of a bud contains leaves only, it lengthens upwards as it expands into a branch; thus a leaf-bud and a branch-bud may be said to be the same. When it contains a flower, this is situated as in the bulb of the tulip, in which small bulbs are formed on the edges of the crown of the root between the scales, which gradually enlarge at the expense of the scales, are detached, become perfect bulbs, and send up leaves and flower-stalks. With respect to the manner in which the leaves are folded—they may be plaited, as in the palm or birch; doubled, as in the rose and oak; embracing, as in the iris and the sago; double embracing, as in valerian, teasel, &c.; double compound, as in carrot, mimosa, &c.; rolled inwards, as in grasses; tiled, as in privet, lilac, &c.; rolled outwards, as in rosemary, primrose, &c.; rolled lengthways, breadthways, rolled from the tip to the base, or wrapped round the stalk.

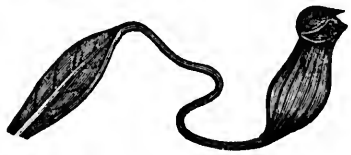
The buds of trees, being in a state of great sensibility, and feeling the first warmth of the sun, the vitality of the continued shoot is roused into action; it attracts the moisture contained in the neighbouring cells charged with nourishing matter; the rising sap also enters its vessels; it gradually swells, and bursting the enclosing scales, pushes into the light and air, unfolding its leaves successively as it advances, until the whole tree becomes green.

Leaves.—Leaves are the grand ornament of plants, and from their numbers, position, and delicacy of organization, they are designed to effect an important office in the vegetable economy. Springing from the branches, and exposed in profusion to the atmosphere, they perform the functions of a breathing apparatus analogous to that of the lungs or gills of animals. A similar purpose, at least, is designed, for the circulatory sap of plants, like the blood of animals, requires to be exposed to the atmospheric influence, in order that it may be suitable for nutrition. This purpose is accomplished by the agency of the leaves, to which the sap, on rising from the roots, through the stem and branches, is propelled or attracted, and there both air and light exercise their beneficial influences. Gaseous qualities, however, are emitted as well as inhaled by the leaves; and that they allow the escape of aqueous fluid is well known. Leaves are thus indispensable to the growth of plants, and care should be taken not to injure them; for defoliation either naturally, or by art or accident, instantly arrests the growth, and the failure or diminished expansion of foliage is a certain sign of debility.

A leaf consists generally of two parts, the petiole, or leaf-stalk; and the lamina, or that part which is broad and thin. Sometimes, however, as in the rose tribe, stipules are attached to the base of the petiole. The leaf-stalk is that part which connects the leaf with the branch, and at the base will be found slightly hollowed, in which a bud rests. Sometimes the leaf-stalk is wanting, as in the sow-thistle and catch-fly, and in this case the leaf is said to be sessile or sitting. The lamina, or broad part of the leaf, is frequently of a different colour on the under side to what it is on the upper. This is exemplified in the common silver-weed (*Potentilla anserina*), the leaves of which are hoary on the lower side and green on the upper. Leaves are either *caducous*, falling in summer; *deciduous*, falling in autumn; *persistent*, remaining till pushed off in the following spring; or *perennial*, when of still longer duration, as in evergreens.

Some leaves are of a very remarkable shape, which none of the foregoing characters can describe. The most remarkable of these is the pitcher plant (*Nepenthes distillatoria*), which is seen in the annexed cut. The leaves of this plant are sheathing at the base, and at the end of the proper leaf is a petiole or stalk, several inches long, which is terminated by a bladder-like vessel furnished with a lid. This vessel is always filled with water, which appears to be distilled from the plant itself.

With regard to the manner in which leaves project from the branches, and their distribution over the woody cylinder to which they are attached, every possible variety may be observed. They may be opposite, that is, two leaves growing on either side of the branch, the one directly opposite to the other; alternate, when one leaf springs out on one side of the branch, and another on the opposite side a little above it, and so on; whorled or *verticillate*, when a number of leaves grow round the stem from a common knot or joint, as in the bed straw. The distribution of alternate and opposite, however, is not regular; for in some instances it will be found that the leaves on the lower part of the stem are alternate, whilst those on the upper part are opposite.



The leaves of most plants possess a power of motion, which is the effect of what is termed irritability or vitality. Thus the leaves of the aspen (*Populus tremula*), from a peculiar formation of the petiole, never rest; and those of the sensitive plant (*Mimosa pudica*) close themselves up on the slightest touch. The flowers of many plants also possess this irritability, closing when night approaches. There is a numerous description of plants which have few or no leaves, as the torch and melon thistles; but their stems are much dilated, presenting a large superficies of parenchymous exterior to the air and light; or they are profusely covered with spines, which, no doubt, conjointly do the office of leaves. It may be remarked, that such plants as the common garden rhubarb, which requires much moisture, are provided with very broad leaves, which catch the rain that falls upon them, and also, by their umbrageous quality, preserve the ground round the stalks from being parched by drought.

Green is the most general colour of leaves, but some are red, or purple, or yellow; some appear nearly white, in consequence of being clothed with short woolly or silky hair. They differ much in substance and structure; some are immensely thick and fleshy, as those of the genus aloe, others remarkably thin, as those of the beech. The texture of the surface is also very dissimilar; some are rough, prickly, and wrinkled, others smooth and glossy. Whatever be their form or appearance, it is found, by minute microscopic observation, that the interior of the fine membranous substance consists of cells and passages suitable to the due exposure of the sap, the inhaling of air, and the absorption of humidity from the atmosphere. The fine downy hair which grows on the leaves is understood to be of service in collecting dew at night, and supplying it to the plant.

Glands.—It is doubtful whether the bodies which usually receive this appellation (*glandulæ*) really exist in the vegetable system. There are, however, minute organs, differing in structure from the common texture of the part where they are situated, which separate some peculiar matter from the ordinary proper juice, and which may be regarded as glands. If this be admitted, these glands occupy the interior and exterior of stems and leaves, vary greatly in form and attachment, and perhaps in structure, although any attempt to demonstrate this can scarcely be depended upon. Internal vegetable glands are generally seated in the substance of leaves, with a small excretory duct or channel opening upon the surface of the leaf. These furnish the little drops of essential oil found on many leaves, as, for instance, that of the black currant. In some leaves, when the cells are swelled with fluids

nese d icts are pressed upon and closed, so that the leaf exhales no odour, although a powerful odour is exhaled as soon as the withering of the leaf opens the ducts. This is the case in sweet-scented meadow-grass, whence new hay derives its odour. External vegetable glands are either with or without a foot-stalk; and all these glands are cellular, with the cells more regular than those in the substance of the leaf, and arranged in circles: a cord of vessels can generally be traced into the substance of the gland. Bristles are sometimes the excretory ducts of glands, as exemplified in borage, the nettle, &c.

Flowers.—A flower consists of several distinct parts, the calyx, corolla, stamens, disk, nectarium, pistillum, and receptacle. A flower is essentially constituted by the presence of sexual organs, either male or female. When there is only one of these present, the plant is termed unisexual; but more commonly these organs are both present in the same flower, which is in this case termed a hermaphrodite. In some instances, although the same plant bears both male and female organs, it is not hermaphrodite, as these organs occur in different flowers; in others, again, the male and female flowers exist only in different plants. Lastly, male, female and hermaphrodite flowers are sometimes found mingled together, either on the same or on different foot-stalks. Sometimes the male or female organs alone, protected in a small scale, constitute the flower; but in general they are surrounded and protected by the corolla and calyx. All these are commonly borne on a stalk called the peduncle (from *pedo*, to prop or support), which, expanding at its extremity, forms the receptacle or torus, as it has been called, upon which the whole of the parts above mentioned are supported. What is called the berry in strawberries, appears to be nothing more than the receptacle bearing the naked seeds on its surface. It is called common, when a number of florets rest on one receptacle. The round button which is exposed when the downy seeds are blown from the head of the dandelion, is an instance of the common receptacle.

The *calyx* is the external leafy envelope surrounding the flower, and in which it rests as in a cup. Sometimes it is entire, but more frequently it is divided into segments (*sepals*), which are more or less separated from each other. It is most commonly green, but in some flowers it is highly coloured.

The *corolla* is the true flower or blossom, and consists of several divisions or leafy parts, called *petals*, which are almost all articulated at the base, and consequently fall off at the earliest manifestations of maturity or decay. The extensive variety of tints in the flowering part of plants, is a remarkable circumstance of vegetable economy; and what may be the precise use of such gayety of colour, has formed the subject of philosophic inquiry. Independently of the exceeding beauty to the eye, which is certainly a matter for pleasing gratulation, it is believed that the lively colours are useful in attracting insects, these creatures incidentally performing an office in the reproductive economy, and in carrying off saccharine exudations.

The lower part of the single petal of a corolla is called the claw, corresponding to the stalk of the leaf; and the broad part is called the limb. The corolla is frequently furnished with certain appendages, attached either to the throat or to the base of the petals, called nectaries. These are placed in different parts of the corolla; in the common auricula they surround the edge of the throat; in the ranunculus or butter-cup tribe, they appear like scales at the bottom of the claw; and in the monkshood, in the form of a spur behind the corolla. They receive the name of nectaries from the supposition that they secrete honey, and they are always found to contain a clear, sweet-tasted fluid.

Stamens, &c.—Within the beautiful corolla are observed several small filamentous objects, on some of which are particles of fine coloured matter like dust. These are parts of the reproductive organization, and consist of stamens and pistils. In general, a stamen consists of two parts, in most cases of a filament (from *filum*, a thread), which is usually white, and always of an anther, which is usually yellow or purple. It has been shown that the stamens are always next to the petals, that is, between their base and the base of the seed-organ. It is upon the number and arrangement of the stamens that systematic botanical arrangements have principally been founded. The following are a few characteristics of the number, length, position, direction, &c., of the stamens. The number of stamens in each flower varies from one to twenty, or more. In length, they are equal or unequal, and this disproportion is sometimes symmetrical, sometimes not. In position they may be opposed to the divisions of the petals, or they may alternate with them. Sometimes they protrude beyond the corolla, at other times they are wholly included within it. Their direction may be erect, pendant, or horizontal, and their summit is variously inclined to or reflected from the centre of the flower. The filament which supports the anther is most commonly straight and filiform; sometimes, however, it is otherwise. It varies, from being as small as a hair to be large and flat like a petal, and its summit is either pointed or obtuse. On the summit is that essential part the *anther*, which is generally formed of two small membranous sacs, attached immediately to each other, or united by an intermediate connecting body. In form, anthers are subject to great variety, and, like the filaments, they sometimes cohere so as to form a sort of tube. Their colour is often yellow, orange, violet, white, &c., but never green or truly blue.

The pollen contained in the anthers consists of numerous regularly-figured small particles, which possess in different plants a very different figure, size, and colour. The number of particles in a cell, which is very small, sometimes amounts to many thousands. In some flowers the pollen consists of transparent grains; in others

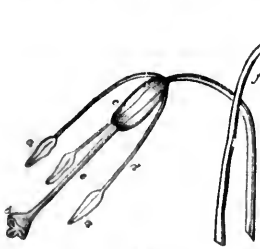


Fig. 9.

a a Stamens. *b* Stigma, or Summit. *c* Ovary, or Seed-Bag. *d* Filament. *e* The Style.

Fig. 10.

f Peduncle. *g* Calyx. *h* Corolla.

they are of a white, purple, blue, or brown, and more frequently of a yellow colour. When a grain of pollen is dropped into water, it swells and bursts, and a minute quantity of matter escapes, which is supposed to be the fecundating principle of the pollen.

We may illustrate the action of the pollen from the anthers, by referring to the annexed small engraving. *a* is the filament or stalk of the stamen, *b* is the anther on its summit, and *c* is the pollen or dust in the act of being shaken down upon the stigma or upper part of a pistil, of which we observe three in a group.

In this figure, it may be remarked, that the anther is a roundish-shaped body, delicately poised on the filament, and ready to vibrate and shake its dust on objects beneath or near it.

In the larger engraving, figs. 9 and 10, the different parts of the flowering structure are combined, as they are frequently seen in nature.

The pistil is a kind of tube with a communication from the stigma, through its style or stalk to the ovary or seed-bag beneath, and down this the pollen is permitted to exercise its influence. The seed-organ or ovary occupies almost always the inferior part of the pistil, and it is there that the process of fructification is fully effected. When cut open it exhibits one or more cavities or cells, in which are contained the rudiments of the seeds or ovula; and it is in it that the change of the ovula into perfect seeds is effected. It is of various forms, but most commonly ovoidal. It is generally seated upon the receptacle, together with the stamens, but frequently it is placed below the flower. Its cavity consists of one or more cells, in which the ovula or rudimentary seeds are found. It may be remarked, that the pistils spring from a nectary or disc in the centre of the flower, and surrounded by the stamens.

The precise mode of fructification is nowhere clearly stated. The stigmatæ are in all cases moistened with a clammy fluid, which causes the grains of pollen to swell, burst, and discharge their minute granules. Some suppose that these are taken up by spongelets in the summit, similar to those of the root, while others allege that the fluid matter in which the granules float is sucked up. It has been discovered that the grains of pollen, when shed on the summit, in a few hours shoot out one or more delicate tubes, which by some philosophers are supposed to extend down as far as the seed-organs, and to expand around and between the nascent seeds. Some believe them to convey thither the granules, which at least enter into the tubes; others, however, deny that this is the case. The seed-organ lies at the base of the pistil, and contains the seeds either nascent or advanced to maturity. It bears a very strong resemblance to the egg-organ of birds and insects, and its parts have accordingly received from naturalists the same scientific names. The seed-organ is usually of an egg-oblong form, and is always composed of an outer membrane, a middle membrane, and an inner membrane, all intimately united. As every seed derives its nourishment from the inner membrane, there must be a communicating point; and this point being always on the verge of the membrane, may be so termed; that on the seed being termed the seed-scar, but popularly, though improperly, named the eye. In some species the verge bears a number of smaller verges, to each of which a seed is attached, by means of the verge cord or seed-stalk. All these parts are obvious in an unripe pea or bean.

Fig. 11.

Fig. 12.

Seed-vessels are various in form; as, for example, in the case of the pea, fig. 11, the vessel is a shell or pod, and in the case of the apple, fig. 12, it is the body of the fruit.

All fruits, in reality, are but so many vessels or receptacles for the seeds, and the various forms in which they appear are individually suitable to the purposes of their growth.

Structural arrangements.—Vegetable, like animal structures are composed of solid and fluid parts. Few of the latter are considered simple in their composition, as they contain more or less of a gelatinous matter, which frequently imparts to them a consistency approaching to that of a solid body. The gum which we often see exuding from trees, is an instance of the viscidity of vegetable fluids. Many of them, also, contain minute globules of matter, which thicken them to a considerable degree. It has next been discovered that these often cohere and form solid masses, or unite in lines so as to constitute fibres. These, again, collect together, and compose various kinds of texture. The solid parts of a vegetable are membrane and fibre, which form the tissues referred to, and their varied combinations in the bark, wood, pith, and medullary or marrow rays. The fluid elements are watery solutions of the soluble materials of the soil, which, by chemical and mechanical agency, as well as the influence of the principle of life, are decomposed, and again united in different proportions, so as to form new substances, or, in other words, the solid components, the textures, and secretions of the vegetable.

The elementary parts of the vegetable structure appear to consist of minute bags, bladders, or vesicles, the coats of which are transparent membranes of extreme tenuity. If a very thin slice of the stem of any plant be put into a drop of pure water, and examined by the microscope, it will be found to consist chiefly of these cells. Their size differs very considerably, from even the thousandth part of an inch to the thirtieth. Although in their original state they possess an oval or globular form, yet, by being variously compressed, they are made to assume other forms, such as twelve-sided figures, or six-sided, like a honey-comb, and pass by insensible gradations into the tubular structure. These various modifications of the same elementary texture have received separate technical names, which, however, it is unnecessary to specify. By the concurring observations of modern botanists, these cells consist of separate vesicles closed on all sides, and destitute of inlet or pore. It seems to have been satisfactorily established, that the partitions which separate them, however thin, must consist of a double membrane, formed by the adhesion of the coats of the two contiguous vessels, and that the fluids gain access not by means of regular apertures, for none can be detected, but by exuding through the substance of the membrane. As from the shape of the cells the coats cannot be supposed to unite at every point, the spaces thus formed have been called *intercellular passages*, *canals*, &c., and they are supposed to perform an important part in the function of nutrition. The nature of the matter contained in the cells and the intercellular spaces, differs according to the part in which it exists, and the peculiar powers of the plant. Sometimes they are filled with certain liquids, the products of vegetable secretion; at other times the contents are simple watery sap, and occasionally they are only filled with air. Air tubes and cells are most frequently met with in the centre of stems and in leaves, rarely in roots, and never in the woody part of plants. Although some plants consist entirely of cells, yet as already observed, the greater number of them have, in addition to these, numerous

ducts or vessels, consisting of membranous tubes of considerable length, interspersed throughout every part of the system. With regard to the origin of these, Dr. Roget observes: "There can be little doubt, indeed, that the vessels of plants take their origin from vesicles, which become elongated by the progress of development in one particular direction; and it is easy to conceive, that, where the extremities of these elongated cells meet, the partitions which separate their cavities may become obliterated at the points of junction, so as to unite them into one continuous tube with an uninterrupted interior passage. This view of the formation of the vessels of plants is confirmed by the gradation that may be traced among these various kinds of structures. Elongated cells are often met with applied to each other endwise, as if preparatory to their coalescence into tubes. Sometimes the tapering ends of fusiform cells are joined laterally, so that the partitions which divide their cavities are oblique. At other times their ends are broader, and admit of their more direct application to each other in the same line, being separated only by membranes passing transversely; in which case they present, under the microscope, the appearance of a necklace of beads. When, by the destruction of these partitions, their cavities become continuous, the tubes they form exhibit a series of contractions at certain intervals, marking their origin from separate cells. In this state they have received the names of *moniliform*, *jointed*, or *beaded vessels*. Traces of the membranous partitions sometimes remain where their obliteration has been only partial, leaving transverse fibres. The conical terminations occasionally observable in the vessels of plants also indicate their cellular origin."

Those parts of plants which do not exhibit the form of either membranes or cells, are comprehended in what is called the *vascular system*, which constitutes almost the entire bulk of the more solid parts of trees. If a branch be cut transversely early in spring, the sap will be found to exude, and cover the whole of the cut surface, which, if examined, will be found to consist of a vast number of exceedingly small fibres, vessels, or pipes, through which the liquid portions of the vegetable ascend or descend. These are, as it were, the veins and arteries of the plant. Indeed, whilst the tissue of cells above described may be said to constitute the flesh of plants, the tissue of fibres may be said to stand for the bones and other firm parts of the system. In animals, the fluids are conveyed to and from a central reservoir called the heart; but such an organ does not exist in the vegetable kingdom. The fluids enter by innumerable mouths at the root, and are conveyed by the vascular system to all parts of the plant fitted to receive them. There is little variation in the diameter of the vessels, and their general form is cylindrical. Their minuteness is quite astonishing. In a piece of oak of about the size of 1-19th of an inch, 20,000 vessels have been reckoned to exist. Hedwig measured the largest vessel in the stem of a gourd; it appeared 1-12th of an inch in diameter through his instrument, which magnified 290 times; so that its real diameter was the 3480th part of an inch. The vessels of plants do not, like those of animals, exist single, but are collected in bundles, or fasciculi as they are called, which sometimes contain hundreds of vessels. They occasionally also ramify; that is, some vessels shoot off from one parcel to unite with another, and afterwards return to that which they had left. By this ramification a reticulated appearance is frequently produced, especially in the bark and leaves of plants. They do not ramify like the vessels of animals from greater into less; but, by the division of a greater fasciculus into several smaller fasciculi, they at last become single, and thus their ramification is effected. It is generally supposed that they do not open into one another; that is, actually unite and be lost in each other, forming that kind of connection which anatomists call inosculation or anastomosing (from a Greek word which signifies to open the mouth.)

These vessels have been named according to the functions which they perform, or the appearances which they assume. There appear to have been two kinds of vessels discovered in plants, the straight and the spiral. Grew describes the former as straight hollow threadlets, fifty times finer than a horse hair, forming a larger tube, as if we should suppose a walking-cane composed of small straws. Leuwenhoeck describes them as composed, like the quills of birds, of two transparent tissues, one placed lengthways and the other across, with no lateral communication. It is the opinion of the highest authorities that both fibres and straight vessels take their origin from spiral vessels. The first is called the simple spiral. If the fleshy scale of any bulb, for instance, that of the lily, be cautiously broken, and the parts separated, the spiral vessels will be observed like screws, partially unrolled. They consist of opaque silvery shining fibres, twisted in a spiral manner, so as to form a hollow cylinder, the spires being generally in contact. This hollow tube is sometimes formed of one continuous fibre, sometimes of several parallel fibres adhering together. The fibres are tenacious, and in some plants elastic. They differ much in size in different plants, and at different stages of the growth of the same plant. They stretch through the whole of its length, from the roots to the leaves and flowers, following the various curvatures of the stem. Grew found that they alternate with the straight vessels in every part of the wood, and surround and ensheath them in the leaf-stalk, the leaf, the flower, and the fruit. The straight vessels are said to be formed in spring, the spiral vessels in summer. These spiral vessels undergo various transformations. In many cases the inner fibres of the tube, instead of forming a continuous spiral, appear in the shape of rings succeeding one another at regular intervals, and constituting what are called annular vessels (from *annus*, a ring). This is considered a primary form of vessel, and, from the two simple varieties of vessels described, more complex forms are elaborated as the plant advances in age. In the punctuated vessel the spires are separated to nearly equal distances from each other, and the intervening spaces are filled up with a membrane sprinkled over with small obscure points or dots.

This is the largest with respect to the diameter of the vegetable vessels; it is at first transparent, but becomes opaque by age. A fourth variety of vessel, which has the same origin as the last, being formed of rings, is that in which the separations are not filled with membrane, but with small productions proceeding from these rings themselves. These ramifications often have the appearance of network, whence they derive the name of *reticulated* spiral vessels. It is impossible, in the present limited treatise, to go into a definition of the varieties and purposes of these vessels; and it will suffice to say that the spiral vessels, in all their variety, serve the office of conveying the sap throughout the whole of the plant. Besides the vessels already enumerated, vegetables contain certain organs denominated *glands*, which are composed of closely-compacted cells, and which perform the function of *secretion*; that is, the conversion of the nutritious joices into particular products for various purposes in the economy of the plant.

Among the parts associated with or arising from the elementary structure already mentioned, are the pith, the wood, the bark, and the epidermis or skin. The pith is that soft, light, and spongy sort of substance which occupies the centre of the stem (hence sometimes called the heart), where it is commonly surrounded by a circle of vessels, which construct for it an appropriate canal. When seen in its most perfect form, it is found to consist entirely of cellular tissue rather loose in texture, as

in the alder, or compact, as at the knot of the ash. The wood (*lignum*) is that hard cylinder which immediately surrounds and envelops the pith, and is enclosed by the bark. It is essentially composed of vessels, and of cellular tissue combined in an infinite variety of ways, and exhibiting every diversity of form. If a tree of several years' standing be cut transversely and examined, it will be found to consist of a number of cylinders, enclosing one another like so many layers or concentric circles disposed around an axis. By the number of these the age of the tree may be determined.

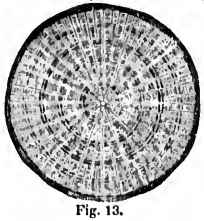


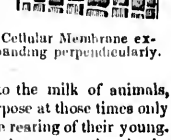
Fig. 13.

Fig. 13 is a section of a stem five years old, having the pith in the centre, and a cylindrical layer for every year of the growth, and the bark on the outside. The outermost layer, which is spongy and less durable than the inner or heartwood, is called alburnum. The whole are traversed by rays or lines diverging from the centre of the stem to its circumference. These are called medullary rays, or silver grain, and they are composed chiefly of large cells, extending transversely, or in the direction of the diameter of the tree, and composing by their union continuous vertical planes the whole length of the trunk. They are called medullary (from *medulla*, marrow), because they were supposed to be processes of the pith, or a continuation of it, which is not the case. Their use appears to be to keep upen the communication between the bark and the pith, which the formation of the wood would otherwise have destroyed. The bark resembles wood in its component parts, being made up like it of vessels and cellular tissue, intimately connected with each other. As in trees a new layer of vessels is annually added to the wood, so a similar but much thinner layer is also made to the bark, to which the name of *liber*, or inner bark, is usually applied, the old layer being pushed outwards. Between the vessels thus annually produced, a considerable portion of cellular tissue is interposed, the cells being commonly filled with juices. The whole is surrounded by an outer zone or envelope, to which the name of skin, epidermis, cuticle, or rind, has been given. It is an extremely thin membrane, and extends over the surface of every part of the plant excepting the spongelets of the roots, and the summit of the pistil in flowers. The rind of plants is similar to the skin of animals in the functions in which it performs. It is, no doubt, intended to protect the more sensible organs beneath. As the scarf-skin of the hand becomes indurated by hard labour, so the rind of the tree, if exposed to a stormy climate, becomes rough, whilst the rind of the same species of plant, if reared in a sheltered situation, like the hands of a delicate lady, remains smooth. As the plants grow, the rind stretches, and sometimes to a considerable extent; but in cases in which it is not easily stretched, as in the elm, it breaks up into innumerable cracks. The birch, and some other trees, "cast their bright skin yearly, like the snake." The rind is transparent and colourless where it is very thin; but it is usually of a brown or gray colour when thick. Various opinions are entertained respecting the origin and structure of this membrane. Some philosophers hold it to be continuous with the bark, and formed of the outer side of its cells. Others describe it as a separate membrane, composed of minute cells, or "bladders," as Grew calls them, which shrink and are dried up as the plant grows older. This opinion is now supported by the highest authorities. There has in some instances been found a very delicate, transparent, and apparently inorganized, membrane on the outside of the rind. Whether it possessed pores, or, as they are sometimes termed, glands, was long a disputed point, but their existence has lately been incontestibly proved. They are a sort of minute bags opening on the outside by an oval slit with a raised border, which contract when water or moisture is applied, and expand in dry air, or when exposed to sunlight.

Having already defined what constitutes the chemical elements of plants, as well as the nature of the food which they derive from the atmosphere and soil, nothing more need here be said on the subject, and we pass on to a short account of the methods by which the ascent and descent of the sap are effected.

The various matters held in solution by the fluid enter the plant in a perfectly crude state. The liquid rises in the stem of the plant, undergoing little or no perceptible change in its progress, and is in this state conducted to the leaves, where it experiences various important modifications. By causing the roots to imbibe coloured liquids, the general course of the sap has been traced with tolerable accuracy, and it is found to traverse principally the ligneous substance of the stem; in trees, its passage is principally through the alburnum, that is, the wood last formed, and not through the bark, as was at one time believed.

The course of the sap varies under different circumstances at different periods of vegetation. At the time when young buds are preparing for their development, which usually takes place after the genial warmth of spring has penetrated beyond the surface of the earth, and expanded the fibres and vessels of the plant, there is created an urgent demand for nourishment, which the roots are actively employed in supplying. As the leaves are not yet completed, the sap is at first applied to purposes somewhat different from those it is destined to fulfil at a more advanced period, when it has to nourish the fully expanded organs; this fluid has, accordingly, been called the nursling sap. It does not rise through the alburnum, but through the wood which is immediately contiguous to the pith, and thence passes, by unknown channels through the layers of wood, to the buds, which it nourishes. In this circuitous circulation it is supposed to undergo a change, or becomes assimilated, in which state it is fitted for entering into combination with the plant, or becoming incorporated with the new organization. This nursling sap has been compared to the milk of animals, which is prepared for a similar purpose at those times only when nutriment is required for the rearing of their young.



Cellular Membrane expanding perpendicularly.

The nutrient sap, which, as we have seen, rises in the stem, and is transmitted to the leaves without any change in its qualities or composition, is immediately by the medium of the stomata, or orifices which abound in the surface of those organs, subjected to the process of exhalation. The proportion of water which the sap loses by exhalation in the leaves, is generally about two-thirds of the whole quantity received: so that it is only the remaining third that returns to nourish the organs of the plant. It has been ascertained that the water thus evaporated is perfectly pure, or at least does not contain more than a 10,000,000th part of the foreign matter with which it was impregnated when first absorbed by the roots. The water thus exhaled, being dissolved by the air the moment it escapes, passes off in the form of invisible vapour. Hales made an experiment with a sun-flower, three feet high, enclosed in a vessel, which he kept for fifteen days, and inferred from it that the daily loss of the plant by exhalation was twenty ounces; and this, he computes, is a quantity seventeen times greater than that lost by insensible perspiration from an equal portion of the surface of the human body.

The comparative quantities of fluid exhaled by the same plant at different times are regulated, not so much by temperature, as by the intensity of the light to which the leaves are exposed. It is only during the day, therefore, that this function is in activity. De Candolle has found that the artificial light of lamps produces on the leaves an effect similar to that of the solar rays, and in a degree proportionate to its intensity. As it is only through the stomata that exhalation proceeds, the number of these pores in a given surface must considerably influence the quantity of fluid exhaled.

By the loss of so large a portion of the water, which in the rising sap had held in solution various foreign materials, these substances are rendered more disposed to separate from the fluid, and to become consolidated on the sides of the cells or vessels, to which they are conducted from the leaves. This, then, is the first modification in the qualities of the sap which it undergoes in those organs.

The sap having undergone in the leaves the double processes of exhalation and aëration, is thereby elaborated into a fluid corresponding to the blood of animals, and fitted for becoming incorporated with the vegetable organs. The crude fluid which enters the leaves is called the ascending sap; and after it leaves them, in order to be distributed throughout the plant, it has been called the returning sap. It still contains a considerable quantity of water, but a large proportion of that which has not been exhaled by the leaves, and its elements, oxygen and hydrogen, has combined with certain other substances, so as to form proximate vegetable products, of which gum is the simplest, and generally the most abundant. The returning sap descends from the leaves through two different structures. In exogenous plants, the greater portion finds a ready passage through the liber, or innermost layer of bark, and another portion descends through the alburnum, or outermost layer of the wood. With regard to the exact channels through which it passes, the same degree of uncertainty prevails as with regard to those which transmit the ascending sap. De Candolle maintains, that in either case the fluids find their way through the intercellular spaces; other physiologists, however, are of opinion that particular vessels are appropriated to the office of transmitting the descending sap. The nature of the forces which actuate the sap in its descent from the leaves, and its distribution to different parts, as well as those powers which contribute to its motion from the roots to the leaves, are involved in equal obscurity. The hypothesis that it resulted from capillary attraction is now generally abandoned.

SECRETION AND EXCRETION IN VEGETABLES.

The modifications which the returning sap undergoes, and its conversion into gummy, saccharine, amylaceous, or ligneous products, are effected by the simpler kinds of cells. But there are other cellular organs in which greater changes take place in its nature, the agents for effecting which are unknown, and are therefore referred generally to the vital energies of vegetation. The process is termed secretion, and the organs by which it is conducted, glands. The matter secreted is sometimes retained in the cells, and sometimes appears on the outside as an excretion, for the plant has the power of throwing out by the root those superfluous or noxious matters which, if retained, would injure it. This explains the fact why plants render the soil where they have long been cultivated less suitable to their continuance in a vigorous condition than it originally was; and also why plants of a different species are frequently found to flourish very well in the same situation, where this apparent deterioration of the soil has taken place.

The vessels in which the fluid secretions are contained are of a peculiar kind, and exhibit ramifications and junctions resembling those of the blood-vessels of animals. We may also discover, by the aid of the microscope, that the fluids contained in these vessels are moving in currents with considerable rapidity, as appears from the visible motions of their globules; and they present, therefore, a remarkable analogy with the circulation of the blood in some of the inferior tribes of animals. This curious phenomenon was first observed by Schultz in the chilidonium, in the year 1820; and he designated it by the term *cyclosis*, in order to distinguish it from the real circulation, if, on further inquiry, it should be found entitled to the latter appellation.

The circular movements which have been thus observed in the milky juices of plants, have lately attracted much attention among botanists; but considerable doubt still prevails whether these appearances afford sufficient evidence of the existence of a general circulation of nutrient juices in the vegetable systems of those plants which exhibit them; for it would appear that in reality the observed motions of the fluid are in every case partial, and the extent of the circuit very limited. The cause of these motions is not yet known: but probably they are ultimately referable to a vital contraction of the vessels, for they cease the moment that the plant has received an injury, and are more active in proportion as the temperature of the atmosphere is higher.

BOTANY.

Various eminent individuals have attempted the classification and naming of plants, each of whose arrangements is called a *system*, and possesses certain peculiar features. The three systems which have been most esteemed, and wholly or partly adopted, are those of Tournefort (1656—1708), Linnæus (1707—1778,) and Jussieu (1699—1777).

THE SYSTEM OF TOURNEFORT.

Tournefort founded his system on the absence or presence, the figure, situation, and proportion, of the *corolla*. This part of the flower is always, when present, the most conspicuous and imposing, and attracted the notice of the earlier botanists, as it does that of children now, more than it really deserved; because, in fact, no part of the flower is more subject to incidental change than the corolla. He divided the vegetable kingdom into two principal parts, namely, herbs and trees; the primary divisions he subdivided into twenty-two classes, the first seventeen of which comprise the herbs, and the other five the ligneous vegetables; these are again separated into one hundred and nineteen sections, but without names or titles being applied to them, as in those of other botanists. The characters of the sections were not always sufficiently defined; and consequently the young botanist often met difficulties in arranging plants in their proper places. Though now known to be imperfect, the system of Tournefort possesses great merit. His labours, considering the state of the science when he lived, were indeed great, and far surpassing those of either Linnæus or Jussieu. In fact, Tournefort was pioneer to both, and amassed, and in many cases assorted to their hands, the materials of which both their systems are formed.

THE LINNÆAN, OR SEXUAL SYSTEM.

The sexuality of plants had been discovered long before the time of Linnæus; but, as far as is now known, he was the first who suggested the idea of classifying plants according to the numbers, connection, and stations of the male and female organs. From the moment the idea occurred to him, he was indefatigable in the completion of a system which, no doubt, he fondly flattered himself was founded in nature. His great acquirements as a scholar, his love of natural history, his station among learned men, and his connection with many learned so

stics, eminently fitted him for achieving this great and laborious work.

The plan of the Linnæan system of botany was intended to comprehend the whole vegetable kingdom, which was arranged in two grand divisions, namely, plants having visible flowers (*Phænogamia*), and plants having no visible flowers (*Agamia* or *Cryptogamia*). The whole are included in twenty-four classes; and these classes are subdivided into orders, genera, and species. The terms used to express the classes are compounded of the Greek numerals and the word *andria*, signifying man. These classes are subdivided into orders, which are designated from their number of pistils by Greek numerals also, with the addition of the word *gynia*, which signifies woman. The following is a summary of the distinguishing traits of the respective classes:—

1. Monandria, with one stamen—Marestail.
2. Diandria, with two stamens—Speedwell.
3. Triandria, with three stamens—Grasses.
4. Tetrandria, with four stamens—Bed-straw.
5. Pentandria, with five stamens—Primrose.
6. Hexandria, with six stamens—Snowdrop.
7. Heptandria, with seven stamens—Water plantain.
8. Octandria, with eight stamens—Heath.
9. Enneandria, with nine stamens—Flowering-rush.
10. Decandria, with ten stamens—Pink.
11. Dodecandria, with eleven to nineteen stamens—Agrimony.
12. Icosandria, twenty or more, inserted into the calyx—Rose.
13. Polyandria, twenty or more, inserted into the receptacle—Poppy.
14. Didynamia, two long and two short—Foxglove.
15. Tetradynamia, four long and two short—Wallflower.
16. Monadelphia, filaments combined in one set—Geranium.
17. Diadelphia, filaments united into two sets—Pea.
18. Polyadelphia, filaments united into more than two sets—St. John's Wort.
19. Syngensia, anthers united into a tube, flowers compound—Thistle.
20. Gynandria, stamens situated upon the style, above the germen—Orchis.
21. Monœcia, stamens and pistils in different flowers on the same plant—Spurge.
22. Diœcia, stamens and pistils in separate flowers on different plants—Willow.
23. Polygamia, stamens and pistils united or separate, on the same or on different plants, and having two different kinds of perianth—Orache.
24. Cryptogamia, stamens and pistils not visible—Moss.

A more minute analysis of the system is as follows:—

Flowers with stamens of a fixed number, and equal in length.

First Class, or Monandria, having one stamen.—If they have one pistil, they are of the first order, or Monogynia; if two pistils, they are of the second order, or Digynia.

Second Class, or Diandria, having two stamens.—If they have one pistil, they are of the first order, or Monogynia; if they have two pistils, they are of the second order, or Digynia; and if three, they are of the third order, or Trigynia.

Third Class, or Triandria, having flowers with only three stamens.—If they have one pistil, they are of the first order; if two, they are of the second order, and if three, of the third order.

Fourth Class, or Tetrandria, having flowers with only four stamens equal in length.—If they have one pistil, they are of the first order; if two, of the second; three of the third; and if four, of the fourth order, or Tetragynia.

Fifth Class, or Pentandria, having flowers with only five stamens.—Those having from one to four pistils are named as in the preceding classes; those having five pistils belong to the fifth order, or Pentagynia, and if they have many pistils, to the sixth order, or Polygynia.

Sixth Class, or Hexandria, having flowers with six stamens.—As they have one, two, or three pistils they belong to the first, second, or third orders; if they have six pistils, to the fourth order; and if many pistils to the fifth order.

Seventh Class, or Heptandria, those having only seven stamens.—If they have one or two pistils, they are classed as before; if four pistils, they belong to the third order; and if seven pistils, to the fourth order.

Eighth Class, or Octandria, having flowers with only eight stamens.—If they have from one to four pistils, they rank in the order corresponding to the number.

Ninth Class, or Enneandria, those having only nine stamens.—If they have one pistil, they belong to the first order; if three, to the second; and if six, to the third.

Tenth Class, or Decandria, having only ten stamens.—If they have one, two, or three pistils, they belong to the first, second, or third orders; if five, to the fourth; and if ten, to the fifth order.

Flowers with stamens of rather uncertain number, but of fixed insertion.

Eleventh Class, or Dodecandria, having flowers with from eleven to nineteen stamens inserted into the receptacle.—If they have from one to five pistils, they belong to the orders corresponding to these numbers; and if they have about twelve pistils, they belong to the sixth order.

Twelfth Class, or Icosandria, having flowers with twenty or more stamens inserted into the flower-cup or the blossom.—If they have one, two, or three pistils, they belong to the first, second, or third orders; if five, to the fourth order; and if many pistils, to the fifth order.

Thirteenth Class, or Polyandria, those having flowers with from twenty to one hundred stamens inserted into the receptacle.—If they have from one to six pistils, they are classed as before; if they have many pistils, they belong to the seventh order.

Flowers with two of the stamens shorter.

Fourteenth Class, or Didynamia, having flowers with four stamens, two longer and two shorter, inserted on a one-petalled blossom.—If the four seeds appear not to be in a seed-vessel, they belong to the first order, or Gymnospermia; but if they appear to be concealed in a seed-organ, they belong to the second order, or Angiospermia.

Fifteenth Class, or Tetradynamia, having flowers with six stamens, four longer and two shorter, the blossom with more petals than one.—If the seed-organ is a short pod, they belong to the first order, or Siliculosa; and if a long round pod, to the second order, or Siliquosa.

Flowers with stamens united by their filaments.

Sixteenth Class, or Monadelphia, having flowers with the filaments of all the stamens united at the base into one bundle.—If there are three stamens, they belong to the first order, Triandria; if five stamens, to the second order, Pentandria; if seven stamens, to the third order, Heptandria; if eight stamens, to the fourth order, Octandria; if ten stamens, to the fifth order, Decandria; if eleven stamens, to the sixth order, Endecandria; if from twelve to twenty stamens, to the seventh order, Dodecandria; and if more than twenty stamens, to the eighth order, Polyandria.

Seventeenth Class, or Diadelphia, having flowers with the filaments of all the stamens united into two bundles.—If they have five stamens, they belong to the first order, Pentandria; if six stamens, to the second order, Hexandria; if eight stamens, to the third order,

Octandria; and if ten stamens, to the fourth order, Decandria.

Eighteenth Class, or Polyadelphia, having flowers with the filaments of all the stamens united into three or more bundles.—If there are from twelve to twenty-five stamens unconnected with the flower-cup, they belong to the first order, Dodecandria; if the bundled stamens are inserted in the cup, to the second order, Icosandria; and if there are more than twenty-five stamens unconnected with the flower-cup, to the third order, Polyandria.

Flowers with stamens united by their anthers.

Nineteenth Class, or Heptandria, having flowers composite, with all the anthers in a floret united into a tube, whilst their filaments are not united. If all the florets are equal, they belong to the first order, Polygamia æqualis; if the florets of the circumference have pistils without stamens, to the second order, Polygamia superflua; if the florets of the circumference have neither stamens nor pistils, to the third order, Polygamia frustranea; if the florets of the circumference have pistils without stamens, and those of the centre stamens without pistils, to the fourth order, Polygamia necessaria; and if the florets have a partial flower-cup all within a general flower-cup, to the fifth order, Polygamia segregata.

Flowers with the stamens and pistils united.

Twentieth Class, or Gynandria, having flowers with the stamens inserted upon the style or seed-organ. If they have one stamen, they belong to the first order, Monandria; if two stamens, to the second order, Diandria; if three stamens, to the third order, Triandria; if four stamens, to the fourth order, Tetrandria; if five stamens, to the fifth order, Pentandria; if six stamens, to the sixth order, Hexandria; and if eight stamens, to the eighth order, Octandria.

Flowers of only one sex.

Twenty-first Class, or Monœcia, having flowers, some with pistils only, and some with stamens only, on the same plant. There are nine orders, taken from the number and bundling of the stamens, as before.

Twenty-second Class, or Dioecia, having flowers with pistils only, or with stamens only, on two separate plants of the same species. There are nine orders, founded as in the preceding class.

Twenty-third Class, or Polygamia, having flowers with both stamens and pistils, and also with only one of these, both on the same and on separate plants of the same species. There are three orders.

No flowers apparent on the plants.

Twenty-fourth Class, or Cryptogamia. Stamens and pistils, if present, cannot, from being very minute, be ascertained. The class contains five orders—Ferns, *Filices;* Mosses, *Musci;* Liverworts, *Hepaticæ;* Seaweeds, *Algæ;* and the Mushrooms, *Fungi.*

To these Linnæus added another class, or rather appendix, which he called *Palmæ*, the flowers of which were not sufficiently known in his time to admit of their being properly placed in the system. They are now distributed into the various classes and orders of the sexual system; they are still kept separate by Jussieu, who has, as Linnæus did, arranged them into an order by themselves, under the old name. In fact, the genus *Palmæ* is of all others the least associable with the Linnæan plan of arrangement; being as distinct a tribe of plants in their structure, forms, and manner of growth, as can be found in the whole vegetable kingdom. Still there were stations provided for them in the sexual scheme, where they have been placed by late writers; but, as already observed, they do not associate well with the genera among which they are ranked. For instance, who would imagine that the cabbage palm (*areca oleracea*) and the Scotch pine (*pinus sylvestris*) were any way allied to each other? Yet the Linnæan botanist must unite them, because their flowers are respectively monœcious, and their stamens are united in one brotherhood.

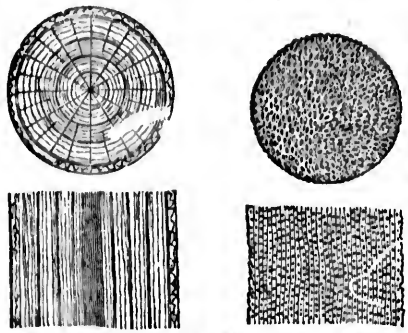
THE JUSSIEUIAN, OR NATURAL SYSTEM.

The author of this new system of botany has taken a very comprehensive view of the vegetable kingdom, and has been fortunate in fixing on those greater characteristics of plants which distinguish them from each other, and which at the same time are the least variable. On examining closely the vegetable membrane, he found it was either uniformly simple, that is, consisting of tissues of cells of nearly equal size and consistence, or of tissues of which the cells were of various sizes intermixed with each other, and formed into fibres lying in straight or in spiral positions, and forming tubes and openings of different structure and consistence. This evident difference of structure served to divide the vegetable kingdom into two parts; the first he called *Cellulares* or *Acotyledoneæ*, that is, plants formed wholly of cellular membrane, and rising from their seeds, or sporules, destitute of cotyledons or seed-leaves. Among these Acotyledoneæ are embraced the lower grades of the vegetable creation—the Filices, the Musci, the Hepaticæ, the Algæ, the Fungi—being placed, as it were, at the bottom of the scale, and exhibiting, in their outward aspect as well as in their internal structure, nothing of that loveliness of form, and but rarely that brilliancy of colouring, by which some of the other divisions of plants are distinguished. They are the first and rudest types of vegetable life, many of them consisting merely of a cluster of minute cells, or of minute threads, as in the case of *proto-coccus* and *byssus;* and many of them being, in fact, nothing more than a mere slime or mucus, as in the *moulds* and *nostocs*. Yet these minute and apparently insignificant tribes of vegetables, as already stated, are by no means useless or superfluous in the scale of nature.

Germination of Dicotyledonous and Monocotyledonous Plants.

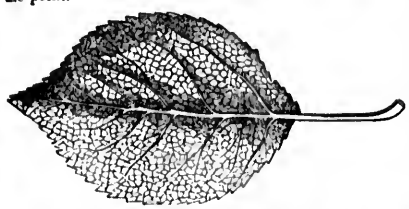
The plants composed of the second description of membrane, Jussieu named *Vasculares* or *Cotyledoneæ*, because the organization was more complicated, consisting of cells of various size, lying in various positions, in denser or looser laminæ or partitions, and being invariably fibrous; and, moreover, rising from their seeds furnished with cotyledons or seed-leaves. Of these, some presented one seed-leaf only, but the great majority presented two; hence the latter were called *Dicotyledoneæ*, and the former *Monocotyledoneæ*. This difference in the development of the seedlings of *Vasculares*, served as a basis for the two classes into which it is divided and named, as above stated.

But besides the difference in the germination of vascular plants, they also differ materially in the manner of their growth. The first class, *Dicotyledoneæ*, is annually increased in bulk by additions of bark and wood on the outside, hence it is also called *Exogenes;* whereas the second class, *Monocotyledoneæ*, is enlarged by the expansion of the interior parts of the stem, and therefore is also called *Endogenes*. These are very striking characteristics of the two classes, as regards their manner of growth; but there is another very obvious distinction, not only in the structure of their stems, but in



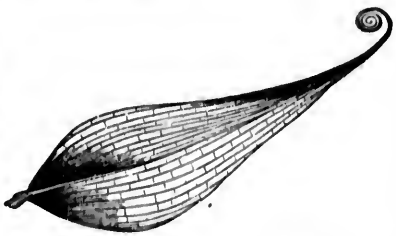
Sections of Dicotyledonous and Monocotyledonous Stems.

leaves. In a leaf of the first class, the petiole, or foot-stalk, is extended directly through the web or face, and is branched pretty regularly from the mid-rib (*costa*) to the margin; whereas in a leaf of the second class, there is no very conspicuous costa or mid-rib, the petiole being pretty equally divided at the base of the leaf into several branches, which run in nearly parallel lines to the point.



Dicotyledonous Leaf of the common Apple-tree.

By these obvious distinctions in the manner of the germination of the seeds, the modes of accretion, and in the structure of the stems and foliage, the two classes of *Cotyledoneæ*, or vascular plants, are clearly marked. But as there are great differences with respect to the stations, connections, and numbers of the floral members of the plants included in this first division, the author of the system found it expedient, in order to facilitate the study of the science, to separate it, as already stated, into two classes; namely, *Dicotyledoneæ* and *Monocotyledoneæ*; the former being again separated into two subdivisions, namely, *Dichlamydeæ*, that is, plants whose flowers have two coats or coverings, the calyx and corolla being distinct; and *Monochlamydeæ*, that is, plants whose flowers have one coat or covering, the calyx and corolla not being distinct, but blended in one, as exemplified in those of the mezereon.

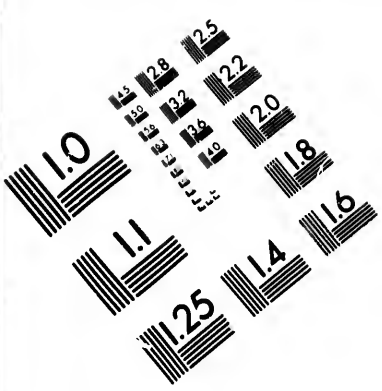


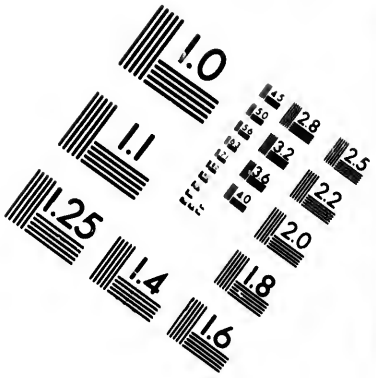
Monocotyledonous Leaf of the Glorioss Superba.

In so limited a treatise it would be impossible, even were it desirable, to mention all the features and characteristics of the Jussieuian system, as comprehended in its ramified divisions, subdivisions, orders, genera, and species; and, indeed, to acquire any thing like useful knowledge on the subject, it must be studied practically in the garden and fields, under the instructions of a master. It is generally allowed that the minute complexity of the divisions and orders is most perplexing to the student, and a simplification in this respect, as well as in the nomenclature, would be very desirable. It is well known that there are many genera which run on the confines of two orders, with neither of which they exactly agree. In such cases, uniting the neutral with one or other of the more decidedly marked orders, would surely be better than constituting a new order, merely for the purpose of more completely or scientifically identifying one unsociable plant. It appears that Jussieu himself was strongly impressed with the desire of limiting the number of his orders, as well as the genera; nevertheless, almost all the improvements which have been recently made in the system by his followers, are divisions of orders, and subdivisions of genera, thus expanding rather than simplifying the system.

It cannot be denied, however, that there are many persons engaged in the cultivation of plants who would rejoice at seeing a new scheme of scientific botany by which the orders of the natural system would be reduced, and the number of genera diminished. Such a thing is not so impracticable as may be imagined; a master mind to contrive, and a few talented practical botanists to sanction the scheme, and fix the nomenclature, would be a work well worth the attention and labours of some universal botanical society instituted for this special purpose.

Botany, as well as every other science, has lately been greatly advanced by that friendly and highly commendable intercourse and interchange of social and scientific communion between home and foreign professors; and no doubt, whatever may be its defects, a union among its professors will speedily supply a remedy.





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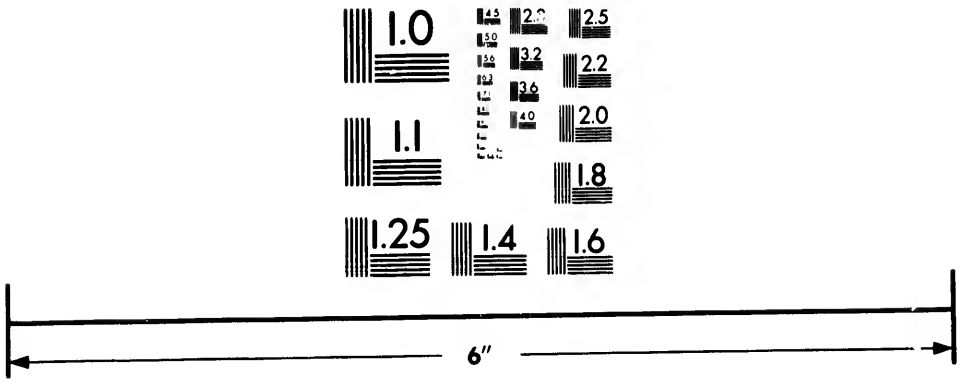

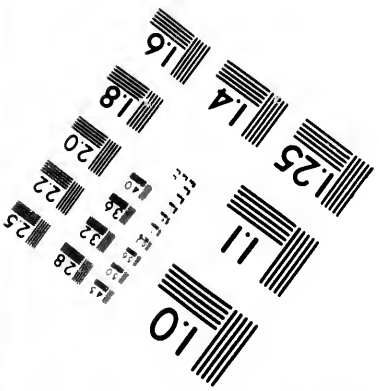

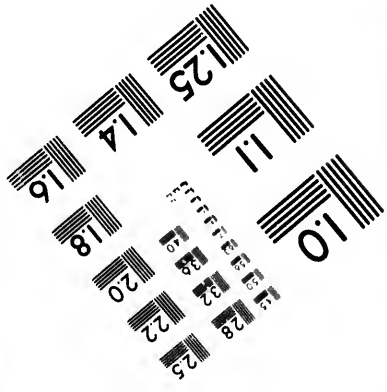

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NATURAL THEOLOGY.

NATURAL THEOLOGY is that branch of logical science which comprehends the discovery of the existence and tributes of a Creator, by investigating the evidences of design in the works of the creation; and, in an enlarged sense, it refers to the probable intentions of God with regard to his creatures, their duty, and conduct.

It cannot but appear to every rational mind, that a subject involving such important views and considerations is full of the deepest interest, and may be made the agent of much intellectual improvement. It is incumbent on us to read the wisdom of God, and his admirable contrivance, in all that we see around us and above us, and which pertains to the universe to which we belong. Independently of the pleasure, and perhaps worldly advantage, which the study of Natural Theology will produce, it will be equally serviceable in keeping alive feelings of piety and devotion. As Lord Brougham has properly remarked, "even the inspired penmen have constant recourse to the views which are derived from the contemplation of nature when they would exalt the Deity by a description of his attributes, or inculcate sentiments of devotion towards him. 'How excellent,' says the Psalmist, 'is thy name in all the earth! thou hast set thy glory above the heavens. I will consider the heavens, the work of thy fingers; the moon and stars which thou hast ordained.'"

It is worthy of remark, as showing the depth and solidity of the foundation on which rests the existence of a supreme, intelligent, and beneficent First Cause, that the further we push our discoveries, the more clearly are the Divine perfections exhibited. It is not merely true that, on a superficial view, we perceive the necessity of believing that a limited and changing world, such as that on which we dwell, could neither exist without being produced, nor be the author of its own existence; and that there must, therefore, be, beyond the range of our senses, an independent and uncreated Essence, without beginning, without bounds, incapable of change, intelligent, ever-active, all-pervading; but it is also certain, that those views are not only uncontradicted, but fully established by the most minute survey of the objects within the sphere of our vision; so that he who penetrates the deepest into the secrets of nature, only multiplies proofs of that most sublime and most animating truth, that "verily there is a God" who made and rules the universe. It is difficult to understand that strange moral obtuseness which has induced a certain class of writers to reject this; for grant but one assertion, which is—and it is not easily to be questioned—that there exist in nature indisputable traces of design, planned with wisdom, directed by goodness, and accomplished by power, and it follows that there also of necessity must have been a *wise, a good, and a powerful Designer.*

Let us suppose ourselves cast ashore upon some island previously unknown to us; we immediately proceed to examine the appearances which present themselves, in order to discover if any traces exist of human inhabitants. To ascertain if such beings there existed, it would not be necessary that they should actually be seen by us. In our wanderings we might come upon a hut bearing all the marks of occupation; we might see the roots of the trees which had been felled to form it, and other tokens of the recent presence of man upon the spot; and did we desire to discover something of their character and habits before we presented ourselves to their notice, it is most probable that sufficient data would be also afforded on which to found an opinion. Were the habitations we discovered merely wigwams, or rude enclosures destitute of the conveniences of civilized life; or were the furniture, the weapons, or the instruments in and around them, such as barbarous nations generally use, we might reasonably argue that we had found the dwelling of an untamed savage. But if, instead of this, we find the surrounding land trenched, enclosed, and cultivated; should we find the common articles of European husbandry, and the common utensils of an European household, we should naturally draw the inference that we had reached the abode of an emigrant, who had thus reared around him the attributes of civilized life. Much more a few additional observations might reveal to us, and enable us to form conjectures, bearing the aspect of probability, concerning the people among whom we had fallen. Now, it is in this way alone that we can argue respecting the Author of all things, and discover proofs and demonstrations of a first supreme Cause. To prove that the formation of all things was the result of DESIGN, it is only necessary to show that they are in general, or in so far as we can discover, admirably suited to the uses and purposes to which they are to be applied—that their arrangement is perfectly harmonious—and that it is impossible that any chance could have thrown them together in a way so happy. To discover if this design can be evidenced or demonstrated, it is necessary to seek through the various works of creation with which we are surrounded; and the more minute we make our inspection, the more likely shall we be to perceive the deduction. If there be some departments to which our senses have a readier access than to others, and which we can therefore more readily examine, from these especially we ought to deduce our results. It may be that we shall find many things, which, from the deficiency of our observing faculties, we cannot understand, nor discover the uses or consequent design which they display; but still, if, in the course of our inspection, we find every part admirably adapted for a specific purpose, and teeming with the most convincing evidences of design, then we may with safety and true philosophy infer that in those objects, which, from their nature and our imperfection we cannot so completely investigate, a greater degree of light would tend to confirm the result to which our previous observations, among other things, had led us.

DESIGN IN THE PLANETARY SYSTEM.

To the uninstructed eye, the earth which we inhabit appears on a clear night to be surrounded by a numerous host of radiant points, which, rising in the east, move majestically through the sky until they reach the western horizon, when they set or disappear; and so completely does this idea commend itself to the mind of an observer, that it requires a considerable effort to conceive how it can be otherwise. But science has taught us that this is a mere illusion, and the discoveries of Copernicus and Sir Isaac Newton have established the truth suggested by Pythagoras upwards of 2000 years before the time of either of them, that the apparent motion of the heavens is the consequence of the real revolution of the earth every twenty-four hours upon its axis; that, with relation to the earth, the sun is stationary, while the earth every year completes a journey round him; that the planets are globes similar to our own, revolving at once upon their own axis, and round the sun; that the moon is a satellite or attendant upon the earth, accompanying it in its course, and at the same time describing every month a circular orbit round it; and that to several of the planets are attached similar

moons or satellites, bearing to them a corresponding relation.

By turning to our article ASTRONOMY, in which the number of the planets, and their distances from the sun, with other particulars, are noted, it will be seen that the earth which we inhabit is but a very small point, even in the solar system (as the concourse of planets round the sun has been called), and that it forms but a part of one magnificent and resplendent whole. But to ascertain the marks of a designing mind in this mighty maze of brilliant wonders, let us turn our attention to some of those particulars regarding them, with which we are acquainted; and it must be confessed, that, if we are to suppose them mere masses of matter unclothed with aught bearing analogy to our vegetable productions, and uninhabited by beings either sentient or rational, it will be difficult to see why any of the arrangements connected with these bodies, so far at least as they themselves are concerned, and apart from their attractive influence upon our own world, should be either beneficial or the contrary. It is solely on the *conjecture* that there are organized beings on their surface to be warmed, and nourished, and upheld, that we can argue regarding such arrangements; and making this conjecture, we shall find that there are some very remarkable apparent contrivances for ministering to their comfort and happiness. It has been supposed that a planet so far distant as Herschel, or even Jupiter or Saturn, must suffer from an extreme deficiency both of light and heat; and hence it has been argued that they are necessarily unfit for the sustenance either of animal or of vegetable life. But when we consider that even Herschel, the most distant from the sun, possesses 248 times the light afforded by our full moon, it will not be difficult to believe, that, with a somewhat more acute power of vision than we possess, the inhabitants of that planet, if formed like ourselves, may be quite able to engage in employments which require considerable minuteness of perception. Besides, to compensate for the deficiency of light derived directly from the sun to this planet in common with Jupiter and Saturn, there is afforded the subsidiary benefit of several moons or satellites to reflect light upon the surface when the sun has withdrawn his beams; neither is it probable that the inhabitants should miserably perish from cold; for putting out of view the possibility that they may be formed with constitutions adapted to a more frigid climate than that of any portion of our world, we must remember that heat is not dependent altogether upon the body from which it originates, but is regulated in a very great measure by the nature of the body to which it is transmitted. Keeping this in view, the planet Mercury may be as cool, and Herschel as warm, as our own globe, although they be at such different distances from the great source of heat. This, however, can be the subject of conjecture alone; and it is only valuable, as showing that we have no reason to suspect the goodness of the Creator in having placed some of his worlds in situations which, at first sight, might be supposed necessarily incapable of affording even the most essential accommodations to organic existences.

Of all the planets, Saturn presents us with the most singular example of design in reference to this subject. When viewed through a telescope, this beautiful orb is seen to be surrounded by a double circle 30,000 miles distant from any part of its surface. This apparatus consists of two concentric rings, separated from each other by a space nearly 3000 miles in breadth, and moving round the planet at the extraordinary rate of a thousand miles a minute. Now, there is one use of this appendage, whatever may be its other purposes, which is very apparent; it must contribute much to enlighten and beautify the globe to which it is attached; and a very little reflection will show the effect it must have in this respect. What a magnificent brilliant spectacle must these rings present to the inhabitants of Saturn! During its more than fourteen years of summer, the night must be enlivened by the bright reflection of this brilliant arch extending its luminous curve from the eastern to the western horizon; while even during the day, the sun must be materially aided by it in shedding light upon the world to which it belongs. "There is no planet in the solar system," says a late writer, "whose firmament will present such a variety of splendid and magnificent objects as that of Saturn. The various aspects of his seven moons, one rising above the horizon while another is setting; a third approaching the meridian; one entering into an eclipse, and another emerging from it; one appearing as a crescent, and another with a gibbous phase, and sometimes the whole of them shining together in one bright assembly; the majestic motions of the rings, at one time illuminating the sky with their splendour, and eclipsing the stars; at another, casting a deep shade over certain portions of the planet, and unveiling to view the wonders of the starry firmament—are scenes worthy of the majesty of the Divine Being to unfold, and the rational creature to contemplate." Of the other planets it is unnecessary individually to speak; our knowledge of them is extremely limited, and we may simply remark, that, in most of them, the same causes exist which in our globe produce the various seasons. To the causes of the seasons, further than that they are the result of the influences of the celestial bodies, we will not here allude. To the arrangement of these, and to the forethought and all-pervading knowledge and goodness of him who designed them, are we, in a word, indebted for the opening beauties of spring—the full glow of summer, arrayed in flowers and clothed with verdure—the sober and sear leaves of autumn, with its aureate fields and happy harvests—and the cold but not desolate winter, which even in its frigidity serves a valuable purpose in the scheme of the natural world.

In these arrangements we see proofs of the care, the power, and the beneficence of that great Being who was the cause of all things. To what else, indeed, shall we trace the primary fact, that, of all the heavenly bodies connected with our system, the sun alone, situated as he is in the centre, possesses undivided light, while the planets which surround him are all dark bodies receiving their light from him? There is no reason, in the nature of things, why a body placed in the centre of a system should give forth light and heat, while those revolving round it should be destitute of them. And yet we find it to be so: and we perceive the consequence of this arrangement to be not only most beneficial, but absolutely indispensable to the existence of the organized beings with which these orbs may be clothed or peopled.

But there is another view of the system of worlds to which our earth belongs, that strongly corroborates the existence of a creating and presiding Being. We mean the provision which is made for its perpetuity, notwithstanding the existence of so many conflicting forces—any one of which, if the system were differently arranged to what we find it to be, might in the course of ages derange the relations which the different bodies composing it possess towards each other, and precipitate the whole into confusion, only equalled by that chaos from which, by might and power, it was called. It will hardly be necessary minutely to explain the causes by which the earth and the other planets are kept in a continual state of rotation round the sun; but as perspicuity is one of the chief objects at which we aim, a few words on this subject will not be out of place. Let it be understood, then, that in every body of matter there exists a certain tendency to rush towards every other body, and that the larger, and denser, and nearer, any two bodies are, the greater is that tendency, and it will easily be comprehended that the sun, the largest of all the bodies in our system, should attract every other

orb with a degree of force regulated by the size, the density, and the distance of each; so that, had all these bodies at first been placed in a state of rest in the universe, they would immediately have begun to move towards the sun, and thus, in the course of time, would, one after the other, have reached and been amalgamated with him in the form of one vast and irregular mass. But at the creation, this result was prevented by communicating to the planets an impulse at right angles to the diameter of their orbits, which, combining with the force of attraction—that is, the power of the sun in drawing or attracting the planets towards himself—caused the planets to revolve round the sun. If each of the planets, however, were to revolve round the sun, with no other prevailing power to interfere with their motions except these two, viz., the attraction of the sun, and the original impulse at creation, they would of course continue as they are throughout all ages; but this is not the case. In the words of Mr. Whewell, "each of them is acted on by all the rest. The earth is constantly drawn by Venus, by Mars, by Jupiter, bodies of various magnitudes perpetually changing their distances and positions with respect to the earth. The earth, in return, is perpetually drawing these bodies. What in the course of time will be the result? The cause acts perpetually, and it has the whole extent of time to work in. Is it not, then, easily conceivable, that, in the lapse of ages, the derangements of the planets may accumulate, their orbits may change their form, their mutual distances may be much increased or much diminished? Is it not possible that these changes may go on without limit, and end in the complete subversion and ruin of the system?" What might have been the case had the balance of power, so to speak, in our system, been differently disposed, it is not easy to say; but that all which is here suggested as possible, would actually take place, were a capricious or ignorant hand to interfere in the distribution of these forces, may assuredly be affirmed. We should soon have "years of unequal length and seasons of capricious temperature; planets and moons of portentous size and aspect, glaring and disappearing at uncertain intervals; tides like deluges sweeping over whole continents; and, perhaps, the collision of two planets, and the consequent destruction of all organization in them both." As the solar system exists, however, so nicely is it adjusted, that the deep inquiries of several of the philosophers of the last century, founded on the most complicated calculations, have shown that its arrangements are stable—that although there are and may be perturbations, there are invariably proportionate compensations; so that, whenever a maximum has been reached in the derangements of the system, it must necessarily begin to revert to its ancient order, and the restoration must in the end be as complete as was the derangement. It would require a hardihood greater than we can easily conceive to exist in the human mind, to view this subject, and to deny, after all, that a perfectly wise, beneficent, and powerful being, originally made and has since sustained and governed all things; for had the original impulse of which we have spoken been a little stronger or a little weaker—had the relative inclination of the orbits of the planets to one another been greater—had one or more of them moved in a direction opposite to the rest—had any one of these causes operated, the whole solar system must sooner or later have been precipitated into chaotic confusion. Will any man, then, deny the proof here afforded of design and skill?

It is proper, before leaving the heavenly bodies, to advert to the fixed stars. If little be known respecting the planets, still less has been ascertained regarding these more distant bodies; but it is by no means an unedifying employment to contemplate, through them, the immensity of creation, and, thus elevated, to draw the conclusion that the Being by whom they originated must indeed be infinitely glorious. Had there been no other design on His part than thus to strike the mind of man with a sense of His magnificence and grandeur, no surer method could have been adopted to impart the lesson. The mind is bewildered when it dwells upon the glories which astronomy developes; and it cannot find words lofty enough to express its sense of the intelligence it discovers, or the proofs of the power and wisdom and goodness it perceives.

RELATIONS BETWEEN MAN AND EXTERNAL NATURE.

Leaving the evidences of design that are to be deduced from the contemplation of the heavens, let us regard some of the relations that exist between man and external nature, and consider the wonderful adaptations to each other which they exhibit. There can be no blank in nature, and, consequently, no body is isolated; all more or less influence each other, and it is of some of these relative influences that we are about to speak. Man is attached by the laws of gravitation to the earth which he inhabits, and is surrounded by an atmospheric medium capable of exercising certain influences upon him; these influences are modified by the Almighty Power to be subservient to his wants, and *designed* to be adapted not only to his necessities, but to those of every living thing, whether plant or animal, that exists. The air which surrounds us exercises, in consequence of its extent, a pressure on the human body equal to about 33,600 pounds. But why do we not sink and miserably perish beneath this immense weight? It is by the re-action of the elastic fluids contained within our bodies that we are enabled to support so enormous a pressure. Here we find a mutual relation between us and the air, which can not be interrupted without mutual injury. Suppose this weight to be withdrawn from our bodies, what would be the result? The expansibility of the fluids contained within us would have no restraint; they would dilate, burst through the solids which contain them, and destroy the individual. Place any animal beneath the receiver of an air-pump, and withdraw the air, the result is very apparent. One of the causes of the inconveniences that are experienced when on the summit of a very high mountain, is, that the air is less dense, and does not oppose so much pressure to the body; and this it is which occasions the violent bleedings from the ears, eyes, and mouth, that sometimes attack those so situated. The effect of a cupping-glass, when applied to the skin, has the same cause. We feel more or less the effects of any sudden change of atmospheric pressure, but still the density of the air is well adapted to the wants of men, had it been greater, our energies would have been oppressed as by an unnatural load; and if less, insufficiently sustained as by a defective support. The senses of hearing and smelling, too, which depend for their perfection on a medium density of the air, would have been either insupportably intense or defective. Again, the atmospheric pressure materially affects temperature. If a certain quantity of air contains a certain quantity of heat, it is clear that it must be equally diffused throughout it; and if the same air be contained in less bulk, or if the pressure be greater, the heat is increased in the same ratio. In the same manner, if the pressure be lessened, the air expands, and with it the heat is diffused over a greater surface. By compressing air, we can produce a sufficient concentration of heat to cause ignition. This influence of the air upon the body is as universal as the former, and the adaptation of the one to the other as constant. With the exception of some countries near the equator, and there only in the hot season and the middle of the day, the temperature of the atmosphere is always below that of man; and as heat always tends towards an equilibrium, it is obvious that a constant subtraction of heat from the body must be going on. Now

we are so organised as to allow of this universal subtraction; and, indeed, were it suddenly stopped, or even diminished, we should soon perish. Again, if the subtraction became increased, or went on more rapidly than the vital principle could replace it, our temperature would sink, our humours and fluids freeze, and in this case, too, we should soon perish. But there are intermediate points between these two extremes; and as we before said, our organization is such that it adapts itself to the degree. All organic bodies are capable of resisting to a great extent, and of modifying the action of heat and cold; indeed, this principle of self-preservation is in them so striking as to have been regarded from a very early period as the most essential attribute of life. The power possessed by the higher classes of animals, of preserving a more or less uniform degree of heat, is almost unlimited. In very cold climates the thermometer not unfrequently sinks to 50° or 55° below the freezing point, while in very hot ones it is sometimes 120° or 125° above it, making a difference of 170 or 180; still, however, the temperature of the body remains unchanged. What unanswerable evidence of design is this, and how limitless must be that Power who could create such wonderful adaptations!

If the atmospheric pressure produces in some measure the regulation of heat and cold, in no less degree does it affect moisture and its concomitants—clouds, mist, rain, snow, and hail; and thus we are dependent for many of our comforts, and for most of our necessities, upon the due adjustment of atmospheric influences. Winds, too, arise from any unwonted atmospheric pressure disturbing the equilibrium of the atmosphere, and are the efforts of nature to restore the balance. All the changes of weather, the most violent storms and tempests, own the same cause.

Connected with this subject, as evidencing design, is the composition of the air, which is precisely that best adapted to support respiration. It consists, besides small proportions of aqueous vapour and carbon, of two fluids, or gases, called oxygen and nitrogen. In a separate state these gases are inimical to life. Lavoisier proved by experiment that pure air, or oxygen gas, if respired for a certain time, rarifies the blood too much, and increases the rapidity of the circulation, the effects of which are violent fever, inflammation of the lungs, and death. Nitrogen is equally destructive to life, as not yielding that principle on which the purification of the blood depends. It is their combination that renders them salutary to the constitution, neither consuming life by too much stimulus and excitement, nor deadening its energies by a languid circulation and a depression of spirits. Why should the air have been composed exactly of twenty-one parts of oxygen and seventy-nine of nitrogen? Why were all other proportions excluded? It could not have been owing to a blind and fortuitous chance. The fact that we find two deadly ingredients so united as to become not only harmless but salutary, must strike every mind with an unanswerable evidence of design. Atmospheric air is absolutely necessary both to animal and vegetable life, and both classes of beings are fully adapted for its reception. The boldest Epicurean could scarcely imagine that so necessary a substance has by mere chance surrounded this globe for the support of its inhabitants, upon whom, without it, God would have bestowed his power and wisdom and goodness in vain; nay, even had men, according to the doctrine of Epicurus, sprung up like mushrooms from the earth without an atmosphere, they could not have existed upon it. Has not, then, the hand of a wise Creator been here visibly employed, or why were we supplied with instruments that render the air available to us?—enabling us to resist its dreadful pressure, and to avail ourselves of its unutterable advantages. If we contemplate for a moment the evils which would have followed had not divine intelligence presided at the constitution of our globe, and placed an atmosphere around it, how fearful and dreary it would have been! The moon has no atmosphere, and hence its climate must be very extraordinary; either the fiercest sunshine must reign, or the keenest frosts endure. If our earth had been similarly situated, no organic being would have adorned its surface; neither plant nor animal could have existed no reflection of light could have taken place no dawn or twilight would have prepared us for morning or for night; a dome blacker than darkness would have surrounded the earth, and light only have become manifest when the eye received it directly from the sun. The blue sky which now surrounds us, and which is owing to the thin watery vapours floating in the atmosphere, and reflecting peculiar rays of light, the blue and the violet, would not have been there. And where can we find such evidences of design as the blue colour which the sky exhibits! Of all hues we could imagine, is there any to surpass that mild and soft ethereal tint, harmonizing with all around us, and on which the eye, fatigued with more brilliant and dazzling objects, turns for relief and repose? The unbeliever may say that this colour was the result of chance; but suppose any other, a bright yellow, a dazzling white, a glaring red, a fearful colour, how uncomfortable and painful would it have been for the vision of man! Again, an atmosphere is necessary to hearing; it enlarges the field of vision, and contributes also to the means of smell; and not only do the beings on earth enjoy life through its means, but it contributes to the sustenance of the finny tribes, enabling them not only to exist, but to rest in the water, or ascend and descend in it in quest of food.

There are still other relations existing between man and external nature, to which we would shortly allude as illustrative of design; and they are such, that without them certain important functions could not be performed, and, consequently, man could not exist. These relations, which may be termed *organic*, are the more numerous and necessary to life, as the organization of the individual is the more developed or complete; and while they may be all included in the two functions of nutrition and sensation, they are the more multiplied as the operations of the former are more complex, and the extension of the latter greater; and hence they are more numerous in man than in any other animal. As in the physical relations, to some of which we have already alluded, so in the organic we must assign the first rank to the atmosphere, so necessary to life, and so admirably adapted to sustain it. It is the medium, also, through which we receive heat, light, and electricity, of which we appear to be as much in need as of that principle of air which purifies our blood, and fits it for the performance of its several operations. These matters are inherent in all living bodies; and if simple elementary bodies do exist, these are they. Many physiologists recognise the greatest analogy between the nervous fluid and electricity, and there is great reason for believing that it assists considerably in the maintenance of the vital phenomena. We know, however, that all these agents exercise a great influence upon life, from the demand that living bodies make upon them. Observe how plants languish and become weak when deprived of light, and how solicitously they move in the direction that will the most expose them to its invigorating influence. Nor is it less necessary to animal existence. Eggs cannot be hatched when deprived of it; and the transformations to which many insects are exposed, go on more slowly when in a darkened place. But let us suppose that this element was only given for the purpose of enlightening the earth, what a wonderful relation, then, does it bear to the eye which perceives it! No one who considers the eye attentively can resist the impression of the evidence of design and skill which its construction exhibits. At the same time, it must be obvious that this construction of the eye would not answer its purposes, unless the constitution of light corresponded to it. Light is an element of the most

peculiar kind and properties, and such an element can hardly be conceived to have been placed in the universe without some regard to its operations and functions. As the eye is made for light, so light must have been made, at least among other ends, for the eye. What we have said of light is equally applicable to heat. It is obvious that the vital energy of plants is much diminished, even suspended, during winter, while with the return of summer they again shoot forth their leaves and flowers; the same alternation obtains also among hybernating animals. Heat is evidently the cause of these changes; so much so, indeed, that vegetables may be forced to invert the order of the seasons. The climate in fact demonstrates the influence of heat. How stunted is both animal and vegetable life in polar regions, and how exuberant do the same individuals become under warmer skies! Electricity undoubtedly exists in the atmosphere in all its states; but we know very imperfectly the laws of this agent, and are still more ignorant of its atmospheric operation. The present state of science, while it permits us to hazard an opinion, does not enable us to perceive those adaptations of its laws to its uses, which we can discover in those cases where the laws and the uses are both of them more apparent. "It is at any rate very probable," says Whewell, "that electricity has its important purposes in the economy of the atmosphere. And this being so, we may see a use in the thunderstorm and the stroke of the lightning. These violent events are, with regard to the electricity of the atmosphere, what winds are with regard to heat and moisture. They restore the equilibrium where it has been disturbed, and carry the fluid from places where it is superfluous, to others where it is deficient. We are so constituted, however, that these crises impress every one with a feeling of awe. The deep lowering of the gloom of the thunder-cloud, the overwhelming burst of the explosion, the flash from which the steadiest eye shrinks, and the irresistible arrow of the lightning which no earthly substance can withstand, speak of something fearful, even independently of the personal danger which they may whisper. They convey, far more than any other appearance does, the idea of a superior and mighty Power, manifesting displeasure and threatening punishment. Yet we find that this is not the language which they speak to the physical inquirer; he sees these formidable symptoms only as the means or the consequences of good. What office the thunderbolt and the whirlwind may have in the *moral* world, we cannot here discuss; but certainly *he* must speculate as far beyond the limits of philosophy as of piety, who pretends to have learned that these work more of evil than of good. In the *natural* world, these apparently destructive agents are, like all other movements and appearances of the atmosphere, parts of a great scheme, of which every discoverable purpose is marked with beneficence as well as wisdom."

We think we have now sufficiently shown the wonderful adaptations and relations that exist between some of the phenomena of external nature and organized existences. It does not accord with our purpose to enter deeply or at greater length into the subject, but even the little we have said must, we hope, carry with it the conviction, that verily it is a God who made and rules the universe.

DESIGN IN THE STRUCTURE OF THE EARTH.

It is evident, even on a very casual inspection, that the surface or crust of the globe we inhabit has undergone many changes and these both great in extent and of long duration. Two agents, fire and water, have been mainly instrumental in their production. The ocean, the great source of aqueous influence, seems, from time immemorial, to have been engaged in a struggle to degrade or level the surface of the earth, not only by the direct action of its tides and currents upon coasts, but also by means of the clouds of vapour which it sends up into the atmosphere, and which re-descend on the earth in the shape of rain and snow, giving rise to numberless springs and rivers, all of which have some effect, less or more, in washing down the dry land. This system of detrition, carried on from age to age, would have produced a state of things very different from that which now exists, had it not been for the antagonizing agency of fire, which, working from the centre outwards, either by extensive convulsions or by slow upheavements, has elevated and repaired the earth's surface as fast as the waters have abraded it, and has compelled the ocean to give back to the light, in the form of continents and islands, the materials which it had before swallowed up.

In this reciprocal action and counteraction, and in their effects upon the earth's surface, we find abundant proofs of benevolent design. By these means have been produced those extensive irregularities—that diversity of hill and vale, ridge and plain—on which depends the fitness of the earth for the maintenance of all organic life, whether animal or vegetable. If the surface were level and smooth, the vapours raised from the sea by the sun would find no channel for their return, and the globe would necessarily become a stagnant marsh, unsuited for the residence of man and the greater part of the creatures that now tenant it along with him. But even if man could have inhabited the earth without its existing irregularities, how few comparatively would have been the advantages of his position! Had the matters carried down and deposited in the early seas, in the form of chalk-beds, limestone-beds, and coal-beds, with all the treasures of minerals and metals accompanying them, remained where they were first accumulated, man would have lost all the most essential elements of industry and civilization. The changes and disruptions which have taken place in the crust, have brought to light a fund of riches, without which he would have been poor in comforts and in arts. Looking to those vast coal-fields alone, which the crust of our globe contains, can we imagine for a moment that the great changes by which these ruined forests of the primeval world were first spread out and moulded into new forms, and then upheaved to the reach of man, to supply him with endless stores of heat, light, and wealth, were produced by blind chance, or by aught but a creative designer, a being equally great and good?

On examining further into the condition of the earth's crust, as established by the changes it has undergone, we find numerous other proofs of the wise foresight which has ordered and arranged the whole. We discover that all the successive mutations of our planet, extensive as they have evidently been, were rendered compatible with the existence and enjoyment of countless numbers of organized and sentient beings. All the rocky strata of the crust, with the exception of those which appear to be the oldest and deepest seated, are mixed up abundantly with organic remains, both animal and vegetable, and indeed some of the great limestone-beds are found to be entirely composed of the shells of insects. In short, whatever was the state of the surface at any given period of the revolutions fitting it for the ultimate residence of man, we find organized beings to have sprung up upon it, with such habits and peculiarities of structure as enabled them to exist and enjoy existence under the peculiar circumstances in which they were placed. Nothing can more distinctly show that our planetary revolutions had a noble scope and purpose, and were under the guidance of laws framed by a being as benevolent as wise.

DESIGN IN ANIMAL PHYSIOLOGY.

The earth, whose structure we have just briefly noticed, serves as the place of habitation for two kinds of existences—the animal and vegetable—to whose forms

tion and functions we discover the beautiful dispensations of Providence, extending on every side over a vast range of beings, and demonstrating the unity of plan on which organized creation has been devised. And, first, the whole circle of our knowledge does not afford greater evidence of design than comparative anatomy; in it we find innumerable contrivances for the comfort and happiness of the different tribes of beings adapted to the peculiarities of their condition; in each animal we see the same organ repeated, but modified to render it more available to the habits of its possessor; and among all the wonders of creation, there are none which strike the inquiring mind more forcibly than this change or modification of formation for the obvious purpose of accommodation to circumstances. Were all animals formed alike, or did the differences which exist between them bear no relation to their habits or destinies, it would be less easy to refute the doctrine which assigns all things to material causes, and excludes the designing hand of an intelligent Creator. Although even then the argument would be totally untenable, still the demonstration which disproves it would have been less satisfactory and perfect, as the surprising skill and beneficent care by which the structure of every animal is adapted to its individual habits and necessities, could not have been so well displayed. A single tool in the hands of the carpenter is a proof of contrivance, but that proof is much multiplied and rendered more forcible when we find the same instrument modified into a thousand forms to suit the different operations of the workman. Few of the functions of animated beings better illustrate this than that of alimentation, which we shall now briefly trace, through the humble zoophytes and worms up to birds and mammiferous animals. Nutrition is common to all animals without exception; and the numerous and varied modifications of the means employed to effect it are obvious proofs of the design and intelligence of the Creator. There are some animals so nearly allied to plants as to be scarcely distinguishable from them; and in these, as in plants, nutritive matter is introduced by mere imbibition. Fixed like plants to the spot where they grow, any other organs would have been superfluous; while to those which are not so attached, but seek their food and obtain it through their locomotive powers, organs for seizing and preparing it are necessary. In them, therefore, we find lips variously and curiously modified; glands about the mouth for furnishing fluids for lubricating dry alimentary matters; a tongue, or something analogous to it; teeth and jaws for breaking down hard substances, and rendering them fit for swallowing; with a passage called the œsophagus, or gullet, leading from the mouth to the stomach, in which the food is at last assimilated, and rendered fit for nourishing the animal. But it is not until we advance some way in the great chain of animal life that these parts become sufficiently obvious, or their offices clearly defined. In the very lowest orders, the mouth and stomach are one continuous tube, or all stomach, as it may be called, and so simple in construction that the animal may be turned inside out without detriment to it; that which was external being now internal, and performing, apparently with equal facility, all the offices of what was previously the stomach. As we advance, however, we find the nutritive organs ceasing to be a mere sucking apparatus, or a receptacle for imbibed fluids. In those whelks which are furnished with proboscides, we find a cavity occupied by the aperture of the œsophagus, a tongue, and teeth; while the snail possesses a perfectly formed mouth and lips. Among the worms, whose stomachs are generally membranous bags, we find examples of wonderful contrivance and design. Thus, the powerful stomach of one species contains three hard calcareous shells, by which the individual is enabled to bruise and masticate the shelled animals on which it feeds. The discoveries of Ehrenberg respecting the animalculæ inhabiting different vegetable effusions, have extended, in an extraordinary degree, our knowledge of the stupendous power of God; and the inimitable proofs of design displayed in beings to whom, in relative size, the mite is an elephant, afford astonishing displays of a minute and most beneficent attention to the preservation of these curious creatures, in whose organization and instincts new and admirable indications of creative wisdom are revealed. By the aid of the microscope, we are enabled to perceive the Creator of the universe minutely busy among the worlds of living creatures to which he has given birth on a blade of grass, or in a drop of water, and to discover fresh scenes of wonder, and interest, and evident design, among hosts of animated beings, infinite in number as in minuteness. These discoveries, of which an able analysis was lately given by Dr. Gardiner in the Edinburgh New Philosophical Journal, have dissipated the obscurity in which the animalculæ were plunged, and displayed the wonders of their organization. To render their digestive organs more conspicuous, he supplied them with coloured food, which communicated its tinge to the cavities through which it passed. The moment a minute particle of a highly attenuated solution of pure indigo was applied to the drop of water on the field of the microscope, in which were some of the infusory animalculæ, the most beautiful phenomena presented themselves. Presently their bodies, which had been hitherto quite transparent, became dotted with a number of spots of a dark blue colour, evidently produced by particles of indigo accumulated in these situations. In some species, particularly those which had a contracted part, or neck, between the head and body, these particles were to be traced in a continuous line in their progress from the mouth to these internal cavities. In this way, by the employment of colouring matters, Ehrenberg succeeded in ascertaining the existence of a system of digestive cavities in all the known species of this tribe of animals; one of the largest of which he found to possess a highly complicated structure with regard to many organs; with respect to the nutritive functions, he found a head provided with a regular apparatus for mastication, consisting of jaws having from two to six teeth, which were seen actively opening and shutting when the animal was taking its food.

As we ascend higher in the scale of existence, we find the digestive apparatus ceasing to be simple cavities, or canals hollowed out of the substance of the body, and becoming distinct organs formed by membranes and coats proper to each; and among these, the first example occurs in the sea anemone, in which we find spaces intervening between the coats of the stomach and the skin of the animal; here, however, the stomach is still a blind pouch, one aperture serving alike for receiving and ejecting the alimentary matters. In the *echini* or sea-urchins these organs are still more perfect. Those of mastication are peculiarly developed; an œsophagus or gullet also presents itself, and a stomach continued into a regular intestine, which takes two turns in the body before it terminates.

DESIGN IN THE FORMATION OF INSECTS.

In the digestive organs of insects we meet with a multitude of new and peculiar formations, while most of the simple forms found in the lower animals are here repeated. The organs of mastication, deglutition, and suction, present such remarkable differences, that the arrangements of modern systems of entomology have been chiefly founded on them. In this order of animals, nutrition by vegetable substances is much more common than in those below it; indeed, as Blumenbach has observed, the business of nutrition in insects does not seem to have for its object the mere preservation of the individual, as in most red-blooded animals, but chiefly the consumption of organized matter, which will appear

from considering the structure of their alimentary canal. In most of those which are subject to a metamorphosis, the stomach in the larva state is of great size in comparison with the short intestinal canal; while those, on the contrary, which take little or no nourishment in their perfect state, have this organ remarkably diminished, and, as it were, contracted. How beautifully does the great size and straight course of the intestinal apparatus of the animal, when in its caterpillar state, coincide with its enormous voracity and quick digestion! It has been computed that caterpillars sometimes devour and digest no less than three times their own weight of aliment in four and twenty hours. On the other hand, during the subsequent metamorphosis which the animal undergoes, no food is taken; but nature, or rather the God of nature, has wonderfully, and with beneficent design, provided against any necessity for this, by causing insects to become very fat, as observed by Malpighi, on the approach of these changes; so that this fat, being absorbed into the blood while these are going on, serves all the purposes of a supply of alimentary matters from without. The insects now under consideration exhibit at different periods of their existence the greatest contrasts, not only in external form, but also in their habits, instincts, and modes of subsistence. The larva, as we have seen, is remarkable for its voracity, requiring large supplies of food, and consuming enormous quantities of vegetable matter; the perfect insect or butterfly, having attained its full dimensions, is sufficiently supported by small quantities of a more nutritious food, consisting either of animal juices or of the fluids prepared by flowers, which are generally of a saccharine quality, and contain nourishment in a highly concentrated form. It is evident that the same apparatus which is necessary for the digestion of the bulky food taken in during the former period, would not be suited for the assimilation of that which is received during the latter; and that, in order to accommodate it to this altered condition of its function, considerable changes must be made in its structure. Who can believe that these changes are made without wisdom, or persuade themselves that all this is to be brought about by causes divested of knowledge and understanding? Dr. Roget, in his admirable Bridgewater Treatise, has beautifully illustrated the subject, by very clear and correct drawings by Mr. Newport, of the three different states of the entire alimentary canal of the privet hawk-moth (*Sphinx ligustri*): first, when a caterpillar; then as a chrysalis; and, lastly, as the moth: and of these, taking our text from Roget, or rather from Herold, we shall endeavour to give some account. We have seen that in the caterpillar the stomach forms by far the most considerable portion of the alimentary canal, bearing some resemblance in its structure and capacity to the stomachs of certain worms. This is followed by a large but short and perfectly straight intestine. In the chrysalis these organs have undergone considerable modifications; the whole canal, but more especially the stomach, being contracted both in length and width: the shortening of the intestine not being proportionate to that of the whole body, obliges it to be folded upon itself for a certain length. In the moth, the contraction of the stomach has proceeded much farther, and an additional cavity, which may be considered as a kind of craw, is developed; the small intestine takes a great many turns during its course, and a large pouch has been formed at the part where it joins the large intestine. "When we consider," say Kirby and Spence, speaking of the phenomena which we have detailed, "the adaptation of all these changes of form, the loss of old organs and the acquisition of new ones, to the functions and mode of life of the animal, we see evidently the all-powerful hand of that Almighty Being who erected the universe, upholding by his providence, and the law that he has given to every creature, the system that he at first brought into existence."

In insects, all parts concerned in digestion are in general smaller and less complicated in the carnivorous than in the herbivorous tribes, apparently from the matters on which the former subsist being already animalized, and requiring, therefore, less preparation before they are received into the blood; and it is no slight indication of design, to observe in them how admirably parts are adapted to the animal necessities. Thus, scorpions, spiders, millepedes, and others, which live for the most part on hard animal substances, are furnished with jaws of a firm horny texture, in many cases very large, when compared with the size of the animal; dragon-flies and beetles, particularly the stag-beetle, are examples in which the jaws are very large and manifest, often possessing tooth-like edges; and these, too, feed on smaller insects than themselves. In another description, of which the bee, wasp, and ant, are examples, we find the animal deserting the coarser kinds of food, living chiefly on juices; and in them also we again find the same mode of taking in nourishment, as in the lowest stages of the animal kingdom, viz., by means of organs of suction, which here, however, are combined with organs for mastication. These organs of suction are still more developed in insects, such as gnats, house-flies, &c.; in them they consist of a tube, of which the sides are strong and fleshy, and movable in every direction, like the trunk of an elephant, and having at its extremity a double fold, resembling lips, which are well adapted for suction. The gnat, and other insects which pierce the skin of animals, have for this purpose instruments termed *lancets*, from their shape and office. In the gnat they are five or six in number, finer than hair, exceedingly sharp, and generally barbed on one side; while in the house-fly they are flat, like the blade of a knife. In the butterflies, however, which are almost wholly independent of solid nutritive matter, these organs present themselves in the greatest perfection, and without any addition of teeth. The proboscis of this order of insects is a double tube, constructed by the two edges being rolled longitudinally till they meet in the middle of the lower surface, thus forming a tube on each side, but leaving also another tube, intermediate to the two lateral ones. This middle tube is formed by the junction of two grooves, which, by the aid of a curious apparatus of hooks, lock into each other, and can be either united into an air-tight canal, or be instantly separated at the pleasure of the animal.* It would be quite incompatible with the nature of this essay to enter at greater length into the evidences of design, deducible from the digestive apparatus of insects. "This immense class," say Cuvier, "in the structure of their alimentary canal, exhibit as many variations as those of all the vertebral animals together: there are not only the differences that strike us in going from family to family, and from species to species, but one and the same individual has often a canal quite different, according as we examine it in its larva or imago;† and all these variations have relations very exact, often easily estimable, with the temporary or constant mode of life of the animals in which it is observable." That this statement is correct, we have seen; and no one can be blind enough to deny that it evinces an origin of things quite incompatible with mere brute and uncertain chance.

DESIGN IN THE FORMATION OF FISHES.

Still ascending in the scale of creation, we come to the contemplation of fishes. We ask, was it by mere chance that the respiratory apparatus of fishes was so formed that their blood receives its vivifying principle from the air which is held in solution by the water in which they move? And who cannot, in this one instance, but discern the hand of a ruling Providence, adapting the structure of animals to the habits which are to characterize

* Roget, ii. 114. † Imago or perfect state

them? Was it by chance that, in the plaice, the sole, the turbot, and other flat fishes, the eyes are placed both on one side of the body, an isolated instance of a want of uniformity in the two sides? No; the design is obvious for as these animals are destined to continue always with one side in the mud at the bottom of the water, an eye on this side would have been superfluous and inconvenient to them. The same design and evident adaptation of structure to circumstances is apparent in the Surinam sprat. This singular animal generally swims so near the surface, that its eye is partly in and partly out of the water; and all its parts correspond with this strange peculiarity, the pupil being partly divided into an upper and lower portion, and the lens consisting of two globes, an upper and a lower one attached together. It appears that the superior part of the eye is, like that of terrestrial animals, adapted to refract rays transmitted by air, and the inferior part, like that of aquatic animals, those transmitted by water, and that the refracting power of the several parts of the eye is accordingly much less above than below. With regard to the function of hearing, we find in fishes the Creator still proceeding on one vast plan or unity of design; with the exception of one species, all the parts of the ear are buried within the skull, and send no process to the surface; and this is precisely what we should have looked for in beings destined to hear through the medium of water, the vibrations of which, being so much more powerful than those of air, would render the complicated apparatus requisite in terrestrial animals in them superfluous. In the class of fishes, we see the lowest condition of the alimentary canal as it is found in vertebral animals. Fishes, voracious to a proverb, subsist almost entirely on animal food. The ocean teems chiefly with animal life. It is a dense, and rich, and moving, and tempestuous element, where vegetation is comparatively small, contrasted with its development in the light and unresisting element of the atmosphere. This rich and resisting element of water abounds in every latitude and in every drop, with all forms of animated beings. Thus, fishes have the means of easily satisfying their voracious appetites with a selection of all kinds of food. Their teeth, more instruments of prehension than mastication, are sharp, recurved, dense, and pointed cones, adapted to grasp and retain every living thing that moves in the waters, and placed in all parts of the mouth of these all-devouring animals; their œsophagus or gullet is very wide and short, and directly opening into their capacious stomach. Thus, the food of fishes not being masticated in the mouth, does not dwell there; and as they are surrounded with an abundance of moisture, they require no salivary glands for lubricating the food, and they have none. Like larvæ, their stomachs are very large: and like them, also, they are chiefly intent upon the gratification of their appetites. All other senses seem to be absorbed in this. Their brain is very small, and their senses correspondingly obtuse.* The intestine of fishes varies considerably in length, according to the kind of food; but generally speaking, it is not longer than their bodies; whereas, in most reptiles—which compose the next class of animals in the ascending scale—it is considerably longer; a provision unnecessary in fishes, perhaps, from the matters on which they for the most part feed, being almost always of the same nature as their own bodies, and therefore requiring comparatively little preparation.

Relinquishing our plan of illustrating design by an account of the digestive apparatus, let us consider, in reptiles, the organs subservient to the function of respiration, which, though somewhat similar to the organs designed for that purpose in birds and mammiferous quadrupeds, differ from those in some remarkable particulars. In reptiles, indeed, as in birds and mammalia, there is a kind of lungs; but they are membranous and not fleshy; that is to say, the cells which they contain are so much larger as to give them a membranous and not a fleshy appearance; nay, in many reptiles the lungs consist of one membranous bag, very similar to the air-bladder of fishes. These lungs or bags are situated in the abdomen, and are loose and floating among the entrails; and they receive their supply of air, in general, not as in birds and mammiferous animals, in consequence of the formation of a vacuum around them, but by a process very similar to that of swallowing. Hence, reptiles, unlike the higher classes of animals, can still continue to breathe if their bodies are cut open, because they do not require a vacuum round the lungs. The air thus received is subservient to the purification of the blood in the usual manner; but it is not so immediately vitiated as air received into fleshy lungs, owing to the larger size of the cells, which do not immediately allow the whole of it to come into contact with their sides. This is one reason why reptiles can sustain an impediment to their respiration for a much longer time than birds and mammals; but another and a much better reason is to be found in the distribution of their blood-vessels, those going to the lungs not forming a necessary part of the general circulating system, but constituting, as it were, only an appendage to it, which may for a time cease to transmit blood without inconvenience. A fish was destined always to be in the water, and a bird or quadruped always in the air; and hence the structure of their respiratory, as well as circulating system, is such as to incapacitate them each for the other element.

DESIGN IN THE FORMATION OF BIRDS.

We come now to birds; and whether we consider their external form or anatomical structure, or in whatever light it is possible to view them, the same conclusion presents itself to the mind. Inexhaustible contrivance, vast and comprehensive intelligence, are everywhere conspicuous. Behold, in their pointed bill, and gradually enlarging head and neck, a means of penetrating the yielding air; then the prow-like breast, the flexible rudder tail, the equipoised wings, and feathers at once adapted for lightness, for strength, and for tenacity, and all bearing relations, not only to each other, but to the air in which the animal is to fly: the wise contrivance of these could not be the result of chance. The investing membranes of their lungs, prolonged from various parts of their surface in the form of tubes, and expanding into bags, enveloping almost all the entrails, so as to keep them constantly surrounded with air, and similar prolongations extending also into the cavity of their bones, serving to inflate these in the same manner—are not the peculiarities for the obvious purpose of giving lightness to the animal, and thus enabling it to support itself in the air?—and does not this palpable subserviency of one part of the structure of birds to the rest, irresistibly inculcate the truth that one master-hand has regulated the whole?

In the beaks or bills of birds, various as are their forms, we can trace an exact adaptation to the food of the species. In those that tear their prey, as the eagle and hawk—or bruise hard fruits, as the parrot—or penetrate the bark of trees, as the woodpecker—the bills are of extraordinary hardness, and, in form, intimately connected with the habits of the animal. In those to whom a sense of feeling in this part is necessary to enable them to find their food in mud or water, as the duck, it is very soft, generally flattened, and so constructed that fluids may filter through it, while the solid food is retained. A bill hooked at the end, with sharp edges, characterizes birds of prey. Another species of strong sharp-edged bill, of an elongated shape, but without a hook, serves to cut and break, but not to tear; and this is the form of the bill in birds which live upon animals which make resistance in the water; some of these are straight, as in the heron—others curved some downwards, some upwards

* Grant's Lectures

Some sharp-edged bills have their sides approximating, like the blade of a knife to its handle, and thus adapted to seize small substances; as the penguin. The small, conical, arched bill of poultry, serves only to take up grain. The bills of the smaller birds present all the varieties of the conical form, from the broad-based cone of the hawfinch to the thread-like cone of the humming-bird. Such of them as have strong short bills live on grain; those with long thin ones, on insects. Where the bill is short, flat, opening very anteriorly, as in martens and swallows, the bird seizes flies and butterflies in the air; and if it be long and curved, possessing some strength, we find it grubs up worms for its food. The same evidence of design which we discover in the bills of birds adapting them to procure the kind of food on which the individual is to subsist, is apparent also in the conformation of their digestive organs. As the food of birds varies from the softest animal matter to the hardest grain, so we observe every gradation in the structure of their stomachs, from the membranous sac of the carnivorous tribes to the true muscular gizzard of granivorous birds—varying according as the food consists of animal or vegetable materials, or presents more or less resistance from the cohesion of its texture.

In no branch of natural history do we find more remarkable evidences of design, than in the varieties of kinds of coverings of animals adapted to their wants and situations on the globe. The covering of birds, in particular, "cannot (says Paley) escape the most vulgar observation. Its lightness, its smoothness, its warmth:—the disposition of the feathers all inclined backward, the down about their stem, the overlapping of their tips, their different configuration in different parts, not to mention the variety of their colours, constitute a vestment for the body, so beautiful and so appropriate to the life which the animal is to lead, as that, I think, we should have had no conception of any thing equally perfect, if we had never seen it, or can now imagine any thing more so. Let us suppose (what is possible only in supposition) a person who had never seen a bird, to be presented with a plucked pheasant, and bid to set his wits to work how to contrive for it a covering which shall unite the qualities of warmth, levity, and least resistance to the air, and the highest degree of each: giving it also as much of beauty and ornament as he could afford. He is the person to behold the work of the Deity, in this part of his creation, with the sentiments which are due to it.

"The commendation which the general aspect of the feathered world seldom fails of exciting, will be increased by further examination. It is one of those cases in which the philosopher has more to admire than the common observer. Every *feather* is a mechanical wonder. If we look at the quill, we find properties not easily brought together—strength and lightness. I know few things more remarkable than the strength and lightness of the very pen with which I am writing. If we cast our eye to the upper part of the stem, we see a material, made for the purpose, used in no other class of animals, and in no other part of birds; tough, light, pliant, elastic. The pith, also, which feeds the feathers, is among animal substances, *sui generis*; neither bone, flesh, membrane, nor tendon.

"But the artificial part of a feather is the beard, or, as it is sometimes, I believe, called, the vane. By the beards are meant, what is fastened on each side of the stem, and what constitute the breadth of the feather: what we usually strip off from one side or both, when we make a pen. The separate pieces or laminæ of which the beard is composed, are called threads, sometimes filaments, or rays. Now, the first thing which an attentive observer will remark is, how much stronger the beard of the feather shows itself to be, when pressed in a direction perpendicular to its plane, than when rubbed, either up or down, in the line of the stem; and he will soon discover the structure which occasions this difference, viz. that the laminæ whereof these beards are composed are flat, and placed with their flat sides towards each other; by which means, whilst they *easily* bend for the approaching of each other, as any one may perceive by drawing his finger ever so lightly upwards, they are harder to bend out of their plane, which is the direction in which they have to encounter the impulse and pressure of the air, and in which their strength is wanted, and put to the trial.

"This is one particularity in the structure of a feather: a second is still more extraordinary. Whoever examines a feather, cannot help taking notice that the threads or laminæ of which we have been speaking, in their natural state, *unite*; that their union is something more than the mere apposition of loose surfaces; that they are not parted asunder without some degree of force; that nevertheless there is no glutinous cohesion between them; that, therefore, by some mechanical means or other, they catch or clasp among themselves, thereby giving to the beard or vane its closeness and compactness of texture. Nor is this all: when two laminæ which have been separated by accident or force are brought together again, they immediately *reclasp*: the connection, whatever it was, is perfectly recovered, and the beard of the feather becomes as smooth and firm as if nothing had happened to it. Draw your finger down the feather, which is against the grain, and you break, probably, the junction of some of the contiguous threads; draw your finger up the feather, and you restore all things to their former state. This is no common contrivance: and now for the mechanism by which it is effected. The threads or laminæ above mentioned are *interlaced* with one another, and the interlacing is performed by means of a vast number of fibres, or teeth, which the laminæ shoot forth on *each side*, and which hook and grapple together. A friend of mine counted fifty of these fibres in one twentieth of an inch. These fibres are crooked, but curved after a different manner; for those which proceed from the thread on the side towards the extremity of the feather, are longer, more flexible, and bent downwards; whereas those which proceed from the side towards the beginning or quill end of the feather, are shorter, firmer, and turn upwards. The process, then, which takes place, is as follows:—When two laminæ are pressed together, so that these long fibres are forced far enough over the short ones, *their* crooked parts fall into the cavity made by the crooked parts of the others, just as the latch that is fastened to a door enters into the cavity of the catch fixed to the door-post, and there hooking itself, *fastens* the door; for it is properly in this manner that one thread of the feather is fastened to the other.

"This admirable structure of the feather, which it is easy to see with the microscope, succeeds perfectly for the use to which nature has designed it; which use was, not only that the laminæ might be united, but that, when one thread or lamina has been separated from another by some external violence, it might be reclasped with sufficient facility and expedition.

"In the *ostrich*, this apparatus of crotchets and fibres, of hooks and teeth, is wanting; and we see the consequence of the want. The filaments hang loose and separate from one another, forming only a kind of down; which constitution of the feathers, however it may fit them for the flowing honours of a lady's head-dress, may be reckoned an imperfection in the bird, inasmuch as wings composed of these feathers, although they may greatly assist it in running, do not serve for flight.

"But under the present division of our subject, our business with feathers is, as they are the *covering* of the bird. And herein a singular circumstance occurs. In the small order of birds which winter with us, from a snipe downwards, let the external colour of the feathers

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so what it will, their Creator has universally given them a bed of *black* down next their bodies. Black, we know, is the warmest colour: and the purpose here is, to *keep in* the heat arising from the heart and circulation of the blood. It is further likewise remarkable, that this is not found in larger birds; for which there is also a reason:—Small birds are much more exposed to the cold than large ones; forasmuch as they present, in proportion to their bulk, a much larger surface to the air. If a turkey were divided into a number of wrens (supposing the shape of the turkey and the wren to be similar), the surface of all the wrens would exceed the surface of the turkey, in the proportion of the length and breadth (or of any homologous line) of a turkey to that of a wren; which would be, perhaps, a proportion of ten to one. It was necessary, therefore, that small birds should be more warmly clad than large ones; and this seems to be the expedient by which that exigency is provided for.

"The *oil* with which birds prune their feathers, and the organ which supplies it, is a specific provision for the winged creation. On each side of the rump of birds is observed a small nipple, yielding upon pressure a butter-like substance, which the bird extracts by pinching the pap with its bill. With this oil or ointment thus procured, the bird dresses its coat, and repeats the action as often as its own sensations teach it that it is in any part wanted, or as the excretion may be sufficient for the expense. The gland, the pap, the nature and quality of the excreted substance, the manner of obtaining it from its lodgment in the body, the application of it when obtained, form, collectively, an evidence of intention which it is not easy to withstand. Nothing similar to it is found in unfeathered animals. What blind *conatus* of nature should produce it in birds? should not produce it in beasts?"

As we have entered so fully into this subject when treating of other classes of beings, we shall not here revert to it, or bring forward illustrations of the truth of our proposition; the facts already detailed seem sufficient to display the wisdom which the great Creator has evinced in this department of the animal world. Nothing can be more worthy of remark than the exhaustless contrivances by which every difficulty is obviated, and nature moulded to the will of its Almighty Author. How many obstacles were to be overcome before a heavy body, like that of an eagle or the mighty condor, could be rendered buoyant in the air, and made to track its adventurous course so high above the earth as to be almost lost to human gaze! How many conditions were necessary to give safety and enjoyment to the smallest of the winged tribes, even after the first obstacles were overcome! Yet how wonderfully simple and efficacious the means by which the whole has been accomplished! That man is indeed to be pitied who can turn even a transient glance on such a subject, without being lost in astonishment and admiration.

THE STRUCTURE OF MAN AND OTHER ANIMALS.

We now arrive at the consideration of the mammalia, or those animals which suckle their young; and at the head of this great class we find man proudly pre-eminent. We have already seen, that, as the materials on which the function of digestion is to be performed are numerous and diversified, so a difference exists in the parts which are subservient to it. Without altering the general plan of the function, or the essential parts of the organs concerned in it, nature makes such additional provisions, in the instincts by which the reception of food is guided, and in the organs by which it is assimilated, as are suited to the circumstances in which the animal is placed, to the food on which it is to subsist, and to the ulterior purposes which it is to serve in the world. Such evidences of design are very remarkable in the mammalia; and in few organs are they more powerfully instanced than in the teeth, between which, in form, structure, and position, and the kind of food on which each animal of this class is intended to subsist, the most intimate connections present themselves. These relations—which indeed may be also traced in the shape of the jaw, in the mode of its articulation with the head, in the proportional size and distribution of the muscles which move the jaw, in the form of the head itself, in the length of the neck and its position on the trunk, and, in fact, in the whole conformation of the skeleton—have been noticed from very early ages, and frequently described.

The purposes answered by the teeth are principally those of seizing and detaining whatever is introduced into the mouth, of cutting it asunder and dividing it into smaller pieces, of loosening its fibrous structure, and of breaking down and grinding its harder portions. Four principal forms have been given to teeth, which accordingly may be distinguished into the conical, the sharp-edged, the flat, and the tuberculated teeth; though we occasionally find a few intermediate modifications of these forms. It is easy to infer the particular functions of each class of teeth, from the obvious mechanical actions to which, by their form, they are especially adapted. The conical teeth, which are generally also sharp-pointed, are principally employed in seizing, piercing, and holding objects; such are the offices they perform in the crocodile and similar reptiles, where all the teeth are of this structure: and such also are their uses in most of the cetacea or whale tribe, where similar forms and arrangements of teeth prevail. The animals subsist on fish, and their teeth are therefore constructed very much on the model of those of fish; while those cetacea, on the other hand, which are herbivorous, as the manatus and dugong, have teeth very differently formed.

The sharp-edged teeth perform the office of cutting and dividing the yielding textures presented to them: they act individually as wedges or chisels; but when co-operating with similar teeth on the opposite jaw, they have the power of cutting like shears or scissors. The flat teeth, of which the surfaces are generally rough, are used, in conjunction with those meeting them in the opposite jaw, for grinding down the food by a lateral motion, in a manner analogous to the operation of millstones in a mill. The tuberculated teeth, of which the surfaces present a number of rounded eminences, corresponding to the depressions in the teeth opposed to them in the other jaw, act more by their direct pressure in breaking down hard substances, and pounding them, as they would be in a mortar.

The apparatus for giving motion to the jaws is likewise varied according to the particular movements required to act upon the food in the different tribes. The articulation of the lower jaw to the skull is somewhat similar to a hinge; but considerable latitude is given to its motions by the interposition of a movable cartilage between the two surfaces of articulation, a contrivance admirably answering the intended purpose. Hence, in addition to the principal movements of opening and shutting, which are made in a vertical direction, the lower jaw has also some degree of mobility in a horizontal or lateral direction, and is likewise capable of being moved backwards or forwards to a certain extent. In the conformation of the teeth and jaws, a remarkable contrast is presented between carnivorous and herbivorous animals. In the former, of which the tiger may be taken as an example, the whole apparatus for mastication is calculated for the destruction of life, and for tearing and dividing the fleshy fibres. The teeth are armed with pointed eminences, which correspond in the opposite jaws, so as exactly to lock into one another, like wheelwork, when the mouth is closed, and the muscles which close it are of enormous size and strength. In the herbivorous animals, on the contrary, as in the antelope, the greatest force is bestowed, not so much on the

motions of opening and shutting, as on those which are necessary for grinding, and which act in a lateral direction. The surfaces of the teeth are flattened and of great extent; and they are at the same time kept rough, like those of millstones, their office being in fact very similar to that performed by these implements of grinding. The *Rodentia*, or gnawing quadrupeds, are formed for subsisting on dry and tough materials, such as the bark and roots, and even the woody fibres of trees, and the harder animal textures; and their teeth are expressly adapted for gnawing, nibbling, and wearing away, by continued attrition, the harder texture of organized bodies. They are all furnished with two front teeth, generally very long, and having the exact shape of a chisel; while the molar or back teeth have surfaces irregularly marked with raised zig-zag lines, rendering them very perfect instruments of trituration. The beaver and rat are examples among omnivorous rodentia, and the hare and rabbit among those that are principally herbivorous.

The *Quadrumana*, or monkey tribes, approach nearer to the human structure in the conformation of their teeth, which are adapted to a mixed kind of food; while the other orders of mammalia exhibit gradations in the structure of their teeth corresponding to the varieties in the nature of their food. Thus the teeth and jaws of the hyæna are formed more especially for breaking bones, while those of the sea-otter have rounded eminences which peculiarly fit them for breaking shells.

"On comparing the structure of the digestive organs of man," continues Dr. Roget,* "with those of other animals belonging to the class mammalia, we find them holding a place in the series intermediate between those of the purely carnivorous and exclusively herbivorous tribes, and in some measure uniting the characters of both. The powers of the human stomach do not indeed extend to the digestion of either the tough woody fibres of vegetables on the one hand, or the compact texture of bones on the other; but still they are competent to extract nourishment from a wider range of alimentary substances than the digestive organs of almost any other animal. This adaptation to a greater variety of food may also be inferred from the form and disposition of the teeth, which combine those of different kinds more completely than in most mammalia. In addition to these peculiarities, we may also here observe, that the sense of taste in the human species appears to be affected by a greater variety of objects than in the other races of animals. All these are concurring indications that nature, in thus rendering man omnivorous, intended to qualify him for maintaining life wherever he could procure the materials of subsistence, whatever might be their nature, whether animal or vegetable, or a mixture of both, and in whatever soil or climate they may be produced; and for endowing him with the power of spreading his race, and extending his dominion over every accessible region of the globe. Thus, then, from the consideration of the peculiar structure of the organs of his frame, may be derived proofs of their being constructed with reference to faculties of a higher and more extensive range than those of any, even the most favoured, species of the brute creation."

There is one circumstance connected with the function of digestion, as displayed in certain of the mammalia, to which, as evidencing great and wonderful design and accommodation in structure to circumstance, we would particularly allude; it is the facility and power of the camel of abstaining long from drinking—a power which he is often necessitated to bring into effect during the long period of nine, ten, or even twelve days. In Arabia, the camel is the chief beast of burden; and in travelling through such a country, it is only at long intervals that water can be obtained; a country, as described by Buffon, without verdure, without water, possessing a burning sun, an air always parched, sandy plains, mountains still more scorched, which the eye runs over without perceiving a single animated being; a dead earth perpetually tossed with the winds, and presenting nothing but bones, scattered flints, rocks perpendicular or overturned; a desert totally void, where the traveller never breathes under a shade, where nothing accompanies him, nothing recalls the idea of animated nature; absolute solitude, more dreadful than that of the deepest forests, more solitary and naked, more lost in an unlimited void; he everywhere beholds space surrounding him as a tomb. The light of day, more dismal than the darkness of night, serves only to give him a clearer view of his own wretchedness and impotence, and to conceal from him the barriers of the void, by extending around him the immense abyss which separates him from the habitable parts of the earth; an abyss which in vain he should attempt to traverse, for hunger, thirst, and scorching heat, haunt every moment that remains to him between despair and death. Frightful as is this picture, the desire of lucre, or the gratification of curiosity, or a love of enterprise no less insatiable, often tempt men to traverse the sandy deserts of Arabia. For their own necessities they may provide, but no human means could afford the possibility of conveying water sufficient to satisfy the longings of a beast of burden which accompany these expeditions. It is by the singular structure of the camel's stomach that it is enabled to pass several days without drinking, and to take at a time a prodigious quantity of water, which remains in reservoirs pure and limpid, because these wells are so contrived that neither the fluids of the body nor of digestion can mix with it. What design is here!—and how redolent of wisdom, and how full of mercy! But let us endeavour to explain the nature of this structure which so evidently adapts the camel to be the inhabitant of the sterile and arid regions of the east:—Ruminating quadrupeds, or those which chew the cud, have two, three, or four stomachs, distinguished, when there are four, by the names of paunch, bonnet, many-plies, and caille. When the food is swallowed for the first time, it passes directly from the gullet into the paunch, where it undergoes some necessary changes, and it is then transmitted to the bonnet, to be mixed with the fluids of the cavity. This process is going on during the time the animal is grazing, when from the incessant occupation of nipping off the grass, for which its teeth are so admirably suited, it has not leisure to chew it sufficiently. When afterwards reposing itself, however, the half-chewed aliment is brought again in successive little balls, from the bonnet into the mouth, where it is subjected to a perfect mastication; and when again swallowed, it passes directly to the many-plies, thence, after some time, to the caille, and ultimately to the intestines. In the camel, however, the paunch has two deep cellular appendages; and the bonnet, or second stomach, has its internal membrane hollowed into numerous deep cells, serving as reservoirs of water, to be used only as occasion requires; while the third stomach is alone appropriated to the immediate necessities of the body. Between the end of the gullet, then, and the orifice of this third stomach, extends through the two first, a long muscle capable of drawing up the third stomach, so as to receive alimentary matters directly from the gullet, when the immediate wants of the animal are to be supplied; but when the fluid taken is meant to be used only in its long journeys through the deserts, this muscle is relaxed, and it is thus received into the two first stomachs, and transmitted onwards by these only at the necessary intervals. The Arabs who traverse these extensive plains, accompanied by these useful animals, are, it is said, sometimes obliged, when faint and in danger of perishing from thirst, to kill one of their camels, for the sake of the water contained in these reservoirs

* Bridgewater Treatise.

which is always found pure and wholesome. It is stated by those who have travelled in Egypt, that camels, when accustomed to go journeys during which they are for a long time deprived of water, acquire the power of dilating the cells, so as to make them contain a more than ordinary quantity, as a supply for their journey.

COMPENSATION OF PARTS IN ANIMATED NATURE.

The evidences of design in creation are beautifully developed in what is called the compensatory structure of animals. By this is signified the supplying the defects of one organ by the structure of another part or organ. Paley has summed up a few striking instances of this nature. "The short unbending neck of the elephant (says he) is compensated by the length and flexibility of his *proboscis*. He could not have reached the ground without it; or, if it be supposed that he might have fed upon the fruit, leaves, or branches, of trees, how was he to drink? Should it be asked, Why is the elephant's neck so short? It may be answered, that the weight of a head so heavy could not have been supported at the end of a longer lever. To a form, therefore, in some respects necessary, but in some respects also inadequate to the occasions of the animal, a supplement is added, which exactly makes up the deficiency under which he laboured.

"If it be suggested that this proboscis may have been produced, in a long course of generations, by the constant endeavour of the elephant to thrust out his nose (which is the general hypothesis by which it has lately been attempted to account for the forms of animated nature), I would ask, How was the animal to subsist in the mean time, during the process, *until* this prolongation of the snout were completed? What was to become of the individual while the species was perfecting?

"Our business at present is simply to point out the relation which this organ bears to the peculiar figure of the animal to which it belongs. And herein all things correspond. The necessity of the elephant's proboscis arises from the shortness of the neck; the shortness of the neck is rendered necessary by the weight of the head. Were we to enter into an examination of the structure and anatomy of the proboscis itself, we should see in it one of the most curious of all examples of animal mechanism. The disposition of the ringlets and fibres, for the purpose, first, of forming a long cartilaginous pipe; secondly of contracting and lengthening that pipe; thirdly, of turning it in every direction at the will of the animal; with the superaddition, at the end, of a fleshy production of about the length and thickness of a finger, and performing the office of a finger, so as to pick up a straw from the ground—these properties of the same organ, taken together, exhibit a specimen not only of design, (which is attested by the advantage), but of consummate art, and, as I may say, of elaborate preparation, in accomplishing that design.

"The hook in the wing of a *bat* is strictly a mechanical, and also a *compensatory*, contrivance. At the angle of its wing there is a bent claw, exactly in the form of a hook, by which the bat attaches itself to the sides of rocks, caves, and buildings, laying hold of crevices, joinings, chinks, and roughnesses. It hooks itself by this claw; remains suspended by this hold; takes its flight from this position: which operations compensate for the decrepitude of its legs and feet. Without her hook, the bat would be the most helpless of all animals. She can neither run upon her feet, nor raise herself from the ground. These inabilities are made up to her by the contrivance in her wing; and in placing a claw on that part, the Creator has deviated from the analogy observed in winged animals. A singular defect required a singular substitute.

"The *crane* kind are to live and seek their food amongst the waters, yet, having no web feet, are incapable of swimming. To make up for this deficiency, they are furnished with long legs for wading, or long bills for groping, or usually with both. This is *compensation*. But I think the true reflection upon the present instance is, how every part of nature is tenanted by appropriate inhabitants. Not only is the surface of deep waters peopled by numerous tribes of birds that swim, but marshes and shallow pools are furnished with hardly less numerous tribes of birds that wade.

"The common *parrot* has, in the structure of its beak, both an inconveniency and a *compensation* for it. When I speak of an inconveniency, I have a view to a dilemma which frequently occurs in the works of nature, viz., that the peculiarity of structure by which an organ is made to answer one purpose, necessarily unfits it for some other purpose. This is the case before us. The upper bill of the parrot is so much hooked, and so much overlaps the lower, that if, as in other birds, the lower chap alone had motion, the bird could scarcely gape wide enough to receive its food; yet this hook and overlapping of the bill could not be spared, for it forms the very instrument by which the bird climbs; to say nothing of the use which it makes of it in breaking nuts and the hard substances upon which it feeds. How, therefore, has nature provided for the opening of this occluded mouth? By making the upper chap movable, as well as the lower. In most birds the upper chap is connected, and makes but one piece, with the skull; but in the parrot, the upper chap is joined to the bone of the head by a strong membrane placed on each side of it, which lifts and depresses it at pleasure.

"The *spider's web* is a *compensating* contrivance. The spider lives upon flies, without wings to pursue them; a case, one would have thought, of great difficulty, yet provided for, and provided by a resource which no stratagem, no effort of the animal, could have produced, had not both its external and internal structure been specifically adapted to the operation.

"In many species of insects the eye is fixed, and consequently without the power of turning the pupil to the object. This great defect is, however, perfectly *compensated*, and by a mechanism which we should not suspect. The eye is a multiplying glass, with a lens looking in every direction, and catching every object; by which means, although the orb of the eye be stationary, the field of vision is as ample as that of other animals, and is commanded on every side. When this lattice-work was first observed, the multiplicity and minuteness of the surfaces must have added to the surprise of the discovery. Adams tells us that fourteen hundred of these reticulations have been counted in the two eyes of a drone-bee.

"In other cases the *compensation* is effected by the number and position of the eyes themselves. The spider has eight eyes, mounted on different parts of the head; two in front, two in the top of the head, two on each side. These eyes are without motion, but by their situation suited to comprehend every view which the wants or safety of the animal render it necessary for it to take.

"The Memoirs of the Natural History of Animals published by the French Academy in the year 1687, furnish us with some curious particulars in the eye of a chameleon. Instead of two eyelids, it is covered by an eyelid with a hole in it. This singular structure appears to be *compensatory*, and to answer to some other singularities in the shape of the animal. The neck of the chameleon is inflexible. To make up for this, the eye is so prominent, that more than half of the ball stands out of the head; by means of which extraordinary projection, the pupil of the eye can be carried by the muscles in every direction, and is capable of being pointed towards every object. But, then, so unusual an exposure of the globe of the eye requires, for its lubricity and defence, a more than ordinary protection of eyelid, as well as a

more than ordinary supply of moisture; yet the motion of an eyelid formed, according to the common construction, would be impeded, as it should seem, by the convexity of the organ. The aperture in the lid meets this difficulty. It enables the animal to keep the principal part of the surface of the eye under cover, and to preserve it in a due state of humidity without shutting out the light; or without performing every moment a nictitation which, it is probable, would be more laborious to this animal than to others.

"But the works of the deity are known by expedients. Where we should look for absolute destitution, where we can reckon up nothing but wants, some contrivance always comes in to supply the privation. A *snail*, without wings, feet, or thread, climbs up the stalks of plants, by the sole aid of a viscid humour discharged from her skin. She adheres to the stems, leaves, and fruits of plants, by means of a sticking plaster. A *mussel*, which might seem, by its helplessness, to lie at the mercy of every wave that went over it, has the singular power of spinning strong tendinous threads, by which she moors her shell to rocks and timbers. A *cockle*, on the contrary, by means of a stiff tongue, works for itself a shelter in the sand. The provisions of nature extend to cases the most desperate. A *lobster* has in its constitution a difficulty so great, that one could hardly conjecture beforehand how nature could dispose of it. In most animals, the skin grows with their growth. If, instead of a soft skin, there be a shell, still it admits of a gradual enlargement. If the shell, as in the tortoise, consists of several pieces, the accession of substance is made at the sutures. Bivalve shells grow bigger by receiving an accretion at their edge; it is the same with spiral shells at their mouth. The simplicity of their form admits of this. But the lobster's shell being applied to the limbs of the body, as well as to the body itself, allows not of either of the modes of growth which are observed to take place in other shells. Its hardness resists expansion, and its complexity renders it incapable of increasing its size by addition of substance to its edge. How, then, was the growth of the lobster to be provided for? Was room to be made for it in the old shell, or was it to be successively fitted with new ones? If a change of shell became necessary, how was the lobster to extricate himself from his present confinement? how was he to uncase his buckler, or draw his legs out of his boots? The process, which fishermen have observed to take place, is as follows:—At certain seasons, the shell of the lobster grows soft; the animal swells its body; the seams open, and the claws burst at the joints. When the shell has thus become loose upon the body, the animal makes a second effort, and by a tremulous spasmodic motion, casts it off. In this state, the liberated but defenceless fish retires into holes in the rock. The released body now suddenly pushes its growth. In about eight-and-forty hours, a fresh concretion of humour upon the surface, i. e. a new shell, is formed, adapted in every part to the increased dimensions of the animal. This wonderful mutation is repeated every year."

In the changing of the colour of the chameleon, we see one of the beautiful compensatory provisions of nature. This little animal, which is common in the East Indies, and some other Asiatic countries, lives upon flies, beetles, or other insects, which it catches by climbing up shrubs or trees, and darting out its tongue; but its pace is slow, and as insects have good eyes to perceive the approach of an enemy, they would be sure to make their escape in the present case, unless the chameleon approached them in disguise. This, therefore, it invariably does. As it passes among green leaves, it is of a green colour; and when it glides by any of a red or yellow tinge, so does it change its hue to red or yellow. So closely does it assume not only the shades and colours, but even the shapes of the leaves around, that a spectator might look at the tree for some minutes before discovering it. How wisely, therefore, has the Creator endowed this poor reptile with the wonderful gift of altering the colour of its skin; for if it were not possessed of such a property, it would inevitably die of hunger.

By carrying our observation upward from the mere physical organization of man, to the *mind* which he possesses, and is able to exert in reference to both sensible objects and abstract subjects, we have still greater reason to admire the proofs of design and goodness in an overruling Creator; for we all feel that this principle of mind—how constituted we do not here stop to inquire—is in harmony with the other works of creation around us. For example, how much are our minds suited to the recognition of what is beautiful in nature and art. This, however, admits of a few separate observations.

BEAUTY.

The wisdom of the great original Contriver is eminently manifested in that property of inanimate and animate objects which we call beauty. Here there is an evident fitness between the taste and habits of animals, human beings included, and what can be seen by the eye. We feel pleasure in contemplating the works of nature more obvious to our senses; and we cannot but remark, that that which is loathsome is not ordinarily presented to the eye. The splendid colouring of the vegetable kingdom, the smooth or spotted skins of the brute creation, and the lovely plumage of the feathered tribe, all give us delight in the contemplation. Consider, also, how beautiful is the outward appearance of the human form. Reflect on what the parts and materials are of which the fairest body is composed, and no further observation will be necessary to show how well these things are wrapped up, so as to form a mass which will be capable of symmetry in its proportion, and of beauty in its aspect; how the bones are covered—the bowels concealed—the roughness of the muscle smoothed and softened; how over the whole is drawn an integument, the skin, which converts the disgusting materials of a dissecting-room into an object of attraction to the sight, or one upon which it rests at least with ease and satisfaction.

The more minutely that we inspect the works of nature, the greater cause have we to wonder at the extraordinary perfection and beauty everywhere prevalent. The microscope develops splendours in the creation of insects which we can hardly comprehend. The back of a diamond-beetle exhibits an assemblage of brilliant colours and glittering gems more splendid than any artificial arrangement of the most precious stones. The colours of the feathers of birds in tropical climates, and the skins of the fishes of Ceylon, are incomparable for their beauty. And why is all this the case? Because it yields a pleasure to the sight, both of men and other living creatures; for the Creator has not denied the feeling of delight to the meanest reptile which crawls. All is beautiful, it would appear, in the estimation of one or other of living creatures. The most insignificant little flower, now blooming far from the haunts of men, in some remote wilderness, does not, as has been said, waste its sweetness on the desert air. It furnishes an object of pleasing gratification to some description of sentient creatures, perhaps so small as to be imperceptible to our naked eye.

Placing agreeableness of aspect entirely out of the question, there is another purpose answered by the skin, and that is concealment. Were it possible to view through this integument the mechanism of our bodies, the sight would frighten us much as it would disgust us. Durst we make a single movement, or stir a step from the place we were in, if we saw our blood circulating, the tendons pulling the lungs blowing, the humours filtrating, and all the incomprehensible assem-

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In clothing the human frame with a covering of skin, the Creator has not omitted to vary its character according to local necessities. The skin is most beautiful on the face, because the face is most exposed to observation; it is softest where least liable to injury, and hardest or firmest in texture where it is most subject to be pressed upon. There is not less sign of contrivance in the manner in which it ceases at the extremities of the toes and fingers. A man has only to look at his hand, to observe with what nicety and precision that covering, which extends over every other part, is here superseded by a different substance and a different texture. Why do we find the skin cease at our fingers' ends, or on the back part of the fingers, and not the fore part? Because something hard or horny was required on these parts, by which we could hold fast or lift nimbly objects which we wished to grasp or seize upon. Nails therefore supersede the skin on such places. The same forethought is visible in the covering of our heads. What could have been a more beautiful or appropriate substance wherewith to cover the head and preserve the hard bony skull from injury, than the hair, a substance at once light, warm, and graceful?

DESIGN IN VEGETABLE PHYSIOLOGY.

In accordance with our intentions of glancing through most of the natural sciences, and bringing home to the main object of our labours treasures illustrative of design from them all, let us now turn our attention to those afforded by the vegetable kingdom of nature. And first, of the mutual relations that exist between animals and vegetables; in considering which, we shall find that these two great organized kingdoms of the creation are made to co-operate in the execution of the same design; each ministering to the other, and preserving that due balance in the constitution of the atmosphere, which adapts it to the welfare and activity of every order of beings, and which would soon be destroyed were the operations of any one of them to be suspended. "It is impossible to contemplate so special an adjustment of opposite effects, without admiring this beautiful dispensation of Providence, extending over so vast a scale of being, and demonstrating the unity of plan on which the whole system of organized creation has been devised." We said in a former part of this essay, that two principles of atmospheric air were oxygen and carbon; that the former was as essential to animal life as the latter was obnoxious to it; but that, on the other hand, carbon was indispensable to the continuance of vegetable organization. We will now endeavour to explain this by a short account of the phenomena of respiration as displayed in the two kingdoms. Among animals, the function of respiration is that by which the blood, received into its vessels from the alimentary canal, is, during its subsequent circulation, kept in a state of requisite purity. This is in all cases effected by bringing it, at intervals, into contiguity, either with atmospheric air alone, or with water containing this air diffused through it; when such is the mutual action of the blood and the air upon each other, that the former is purified and passes in general from a dingy purple to a bright scarlet colour, while the latter is in the same degree rendered impure, and after a time becomes inadequate to support either respiration or combustion. Now, whether the aërating organs be lungs or gills, it appears to be the object of nature, in their construction, to expose a large surface to the contact of air. This object is accomplished by their division into numerous cells or leaf-like processes, or by their extension on the walls of cavities, or the surface of pectinated ridges. The blood brought to these organs is there distributed by their terminating branches. Although still retained in vessels, it can nevertheless be easily acted upon by the air on the exterior. Priestley found the colour of blood changed by the air when enclosed in a moistened bladder, and the same effect was observed by Hunter when it was covered with goldbeaters' skin. It is scarcely possible to determine by direct observation what is the exact nature of the changes that the blood undergoes in its passage through the lungs; the most obvious is its change of colour; and the chemical differences between the dark purple blood in the veins before it has reached the lungs, and the bright vermilion colour it exhibits in the arteries after it has circulated through the lungs, and been exposed to the influence of the air, may be collected from the changes made in the air itself. Atmospheric air is known to consist of certain principles in definite proportions; when it has acted upon the blood, and is returned from the lungs, it is found that a certain proportion of oxygen which it contained has disappeared, and that the place of this oxygen is almost wholly supplied by an addition of carbonic acid gas and watery vapour. The exact quantity of oxygen which is lost in natural respiration, varies in different animals, and even in different conditions of the same animal. Birds, for instance, consume larger quantities of oxygen by their respiration, and hence require, for the maintenance of life, a purer air than other vertebrated animals. Vauquelin, however, found that many species of insects and worms possess the power of abstracting oxygen from the atmosphere in a much greater degree than the larger animals; thus, snails are capable of living for a long time in the vitiated air in which a bird had perished. Some insects which conceal themselves in holes, or burrow under ground, have been known to deprive the air of every appreciable portion of its oxygen. It is observed by Spallanzani, that those animals whose modes of life oblige them to remain for a great length of time in these confined situations, possess this power in a greater degree than others which enjoy more liberty of moving in the open air: so admirably have the faculties of animals been, in every instance, accommodated to their respective wants.

Now, bearing in mind that the air coming in contact with the blood of animals parts with its oxygen, and receives in its place carbonic acid gas, let us consider the function of respiration, or more properly aëration, as it occurs in vegetables. It was necessary that some means should be appointed by which this great quantity of carbon given out into the air by animals, and so injurious to animal life, should be removed from it. We have said that this principle was necessary to vegetable life; and here we find the means not only by which in a very considerable degree it is procured, but also by which it is removed from the atmosphere. The leaves of plants are analogous to the lungs of animals, and it is in them principally that the decomposition of the carbonic acid absorbed from the air is effected. When exposed to the action of the sun, they decompose that gas, retain its carbon, and disengage its oxygen. Solar light is an essential agent in effecting this chemical change; for it is never found to take place at night, nor while the plant is kept in the dark. That the carbon resulting from this decomposition of carbonic acid is retained by the plant, has been most satisfactorily proved by the experiments of Saussure, who found that this process is attended with a sensible increase in the quantity of carbon which the plant had previously contained. "Thus the great object to be answered by this vegetable aëration," says Dr. Roget, speaking at considerable length of this undeniable evidence of design to which we have thus shortly alluded, "is exactly the converse of that which we see effected by the respiration of animals; in the former it is adding carbon to the vegetable organization; in the latter, it is that of discharging the superfluous quantity of carbon from the animal system. On the whole, there

fore, the atmosphere is continually receiving from the vegetable kingdom a large accession of oxygen, and is at the same time freed from an equal portion of carbonic acid gas, both of which effects tend to its purification, and to its remaining adapted to the respiration of animals."

We have not much space to devote to the contemplation of vegetables, but we are unwilling to leave the subject without alluding to some other evidences of design which we find displayed in them. Among these, nothing more beautifully demonstrates that nature, or rather the Almighty Creator of nature, proceeds on a uniformity of plan and design, than the fact that plants as well as animals are possessed of the means of reproducing and continuing their species. The pistil which occupies the centre of the flower is destined to produce the seeds, while the stamens of the plant contain the dust necessary for fertilizing them, and without which the seeds would not produce young plants. Nature has guarded with nice care this precious dust, for on its preservation depends the continuance of the species. The apparatus by which in many flowers it is defended from injury, is very curious; nor are the means that are provided by which it comes in contact with the stigma of the pistil less demonstrative of a great, a wise, and a beneficent Providence. In some plants, where the organs are in the same flower, the stamens are placed above the stigma, upon which the dust, or pollen, falls by its own gravity; in others, we find the contrary is the case, the pistil being the longest; but here the flower is generally drooping. To assist the emission of the pollen, and its contact with the stigma, in many plants the stamens possess a very apparent moving power. When ripe, the ten stamens of the rue are seen alternately to bend down upon the stigma, deposit their portion of pollen, and return to their former position. The stalks or filaments of the pellitory of the wall are possessed of a remarkable elasticity, and thus forcibly scatter the pollen. This is very apparent if touched by the point of a needle; immediately it acts with a jerk, which dashes the pollen with some force on the stigma. The same arrangement is met with in the barberry bush, in which the six stamens remain sheltered under the concave tips of the flower-leaves or petals, till some extraneous body, as an insect in search of honey, touches the filament, which instantly contracts, and also dashes the pollen against the stigma. But all plants have not their stamens and pistils sheltered under the same veil; in many they are in different flowers, and in others even placed on different plants. Here, again, we have to admire the wise measure nature has taken for the accomplishment of her designs. In many the scattering of the pollen is effected by the winds; to favour the access of which, we find in some, as the hazel, the leaves are not evolved until after the seed has been perfected; or, if the plants be evergreens, the leaves are needle-shaped, so as to present very little obstacle to the passage of the pollen, which is secreted in much larger quantity than usual. Various species of insects, and especially the bee, are selected by nature for this purpose. In the pink we observe numerous small insects creeping to and fro, and thus depositing the pollen on the stigma. In flowers where the stamens and pistils are on different plants, often at a considerable distance from each other, bees, and other flying insects, are peculiarly accessory to the great end of nature. These insects, it is true, do not visit the flower for the purpose of scattering the pollen; they only seek for the sweet juice which exudes from its nectary. Their hairy body, which nature did not bestow without design, is seen covered with pollen, often in such quantities as to impede the progress of the animal; this, whenever they visit another flower, is rubbed against the stigma: and it is a fact, no less wonderful than calculated to fill us with admiration at the wise provision of nature, that many insects are peculiar to one flower, and that others, as the bee, will only visit one species in each journey from its hive.

The various methods which nature employs to disperse the different varieties of seeds over the earth, are truly wonderful. Many plants, when the seed is fully ripe, discharge it from its covering, with a jerk or elastic spring. The common oat is thrown out in this way, and the loud crackling of the pods of the broom in a dry sunshiny day, or, as Drummond has it, "bursting seed-balls crackling in the sun," is caused by their bursting and scattering about the contained seeds, and must have been frequently noticed. "Who has not listened," again asks Sir James Edward Smith, "in a calm and sunny day, to the crackling of the furze bushes, caused by the explosion of their elastic little pods; or watched the down of innumerable seeds floating on a summer breeze, till they are overtaken by a shower, which, moistening their wings, stops their farther flight, and at the same time accomplishes its final purpose, by immediately promoting the germination of each seed in the moist earth! How little are children aware, when they blow away the seeds of the dandelion, or stick burs in sport upon each other's clothes, that they are fulfilling one of the great ends of nature." These downy appendages, to which Sir J. E. Smith alludes, buoy up the lighter seeds, as the thistles, and carry them floating through the air to great distances. Then there are the currents of rivers which bear the seeds from one part of the country to another; and even seas and oceans, whose tides and currents float along the germs of vegetation to the various regions of the globe. Birds, too, by feeding on particular seeds, carry them to great distances, where, being often voided entire, they vegetate. There is evident design in this. It could not have been by mere chance, that in flowers which stand erect, the pistil is shorter than the stamens, permitting the pollen as it falls to descend upon the stigma; and when the flower is drooping, that the contrary arrangement is effected. And surely no one will be blind or hardy enough to assert that the mechanical means, to which we have alluded, for the dispersion of seeds, with all the beauty and aptitude of its arrangement, was not the result of divine wisdom—a wisdom which will be still more apparent when we extend our views from the power which called into being such various and beauteous existences, and gave the means of distributing them over the globe, and consider the laws that govern that distribution which we so much admire.

It is not here out of place to remark, that there is scarcely a vegetable production on which some species of animal does not subsist; and, generally speaking, wherever that peculiar production is to be found, there also is the animal to which it furnishes wholesome food. With some striking examples of this kind, the most uneducated man is acquainted; he knows that the partridge is on the plain, the woodcock in the forests, the grouse on the moors, and the ptarmigan on the loftiest peaks of the mountains. He knows, too, that other species migrate from country to country, seeking their food in distant regions, over trackless oceans, when it fails in their native haunts; and among the animal kingdom so universal is this, as to form an example of the wonderful adaptations which exist between it and the vegetable world. Vegetables, like animals, are adapted to varieties of climate and temperature; and when we consider their distribution over the globe, we shall find that those which are most essential to the maintenance of man, bear a variety of climate better than most others. This is the case with greens, carrots, potatoes, and many kinds of grain. Warm climates are much more favourable to vegetation than cold. In Spitzbergen, the whole number of plants with conspicuous flowers, natives of the country, is found by botanists scarcely to exceed thirty species; while in the warmer regions of the West Indies

in Madagascar and the coast of Coromandel, Willdenow enumerates from four to five thousand different species of indigenous plants. Now observe how admirably this distribution of plants corresponds with the wants and necessities of man. A vegetable diet is most suitable both to the tastes and the actual needs of the inhabitants of warm climates, and there we find that kind of food most abundant.

It is impossible for a reflecting individual to walk beside a field of growing barley, without being impressed with the conviction, that, in the economy of this description of grain, the design of a Creator has been wonderfully manifested. An ear of barley differs from one of wheat or oats. Each of the grains is furnished with a long slender bristle or beard, which is prickly to the touch, and seems to serve as a protection to the ear. These bristles form a roof, if we may so call it, to carry off the rain from the ear, and yet, by their elegant disposition, do not prevent the heat of the sun and the light from influencing the grain. And why should such be the case with barley, when the ears of wheat, oats, &c., do not possess any such protective process? Because barley is a grain easily injured by wet, which if not carried off would cause the ear to sprout even while on the stalk, and consequently be entirely useless to man.

In speaking of the economy of vegetable life, it should not pass unnoticed that there is a remarkable instance of creative wisdom in the means which have been arranged for the growth of plants from putrescent matter. All kinds of vegetable and animal substances, when deprived of life, as well as excrementitious matter, have a tendency to decomposition—that is, to resolve themselves into elementary gases of which they have been chiefly composed. This process of dissolution, as every one knows, produces a most disagreeable odour, which is often inimical to animal life. But this is not an evil; it displays a bountiful provision in nature; for it tells us, in a way not to be misunderstood, that the substance undergoing, or about to undergo, the putrefactive process, should be buried underground; and being there deposited, it immediately proceeds to supply its no longer useful gases to the infant plants and crops of grain which flourish on the surface. Thus do we see another striking evidence of the harmonious design which everywhere prevails between the animal and vegetable creation.

It has been said that a vegetable diet is preferred by the inhabitants of warm countries: to them sobriety is an easy virtue and a happy consequence of the climate. The people of northern regions, on the contrary, are voracious from instinct and necessity. They swallow enormous quantities of food, and prefer those substances which in digestion produce the most heat. Obliged to struggle incessantly against the action of cold, their life is but a continual act of resistance to external influences. Let us not reproach them with voracity, and their avidity for ardent spirits and fermented liquors. Those nations which inhabit the confines of the habitable world, in which man is scarcely able to withstand the severity of the climate, the inhabitants of Kamtschatka, the Samoiedes, &c., live on fish, that, in the heaps in which they are piled up, have already undergone a certain degree of putrefactive fermentation. In them there is a necessity for this inward excitement, which in our climate would be inevitably attended with disease, and probably death. The abuse of spirituous liquors is fatal to the European transported to the burning climate of the West Indies. The Russian drinks spirituous liquors with a sort of impunity, and lives on to an advanced age, amidst excesses under which an inhabitant of the south of Europe would sink.

The influence of climate not only affects alike the regimen of man in health, but of man in sickness; and it has been justly observed of medicine, that it ought to vary according to the places in which it is practised. A few substances, for the most part obtained from the vegetable kingdom, sufficed to Hippocrates in the treatment of diseases; and physicians who practise in a climate such as Greece, may imitate the simplicity of the father of medicine. Opium, bark, wine, spirits, aromatics, and the most powerful cordials, are, on the other hand, the medicines suited to the inhabitants of the north; and thus we are enabled to use freely those medicines which elsewhere would be attended with the utmost danger.

We are now prepared to understand the beautiful and wonderful harmony that exists between the distribution of man and plants over the globe; and no one, we think, can deny their meed of praise and admiration for the care and beneficence which this universal adaptation exhibits.

The frigid zone contains but few species of plants, and the verdure of those countries which lie within the polar circle are confined chiefly to the hills having a southern aspect, and the trees are of very diminutive growth. Besides mosses and lichens, there exist ferns, creeping plants, and some shrubs yielding berries of an agreeable flavour. The arctic regions of Europe are peculiarly favoured; for in certain parts of Lapland there are fine forests, and even rye and leguminous plants are produced.

In the high latitudes of the northern temperate zone are the pine and the fir, which show their adaptation to a cold climate by retaining their verdure in the midst of the regions of winter. To these, as advancing southward, succeed the oak, the elm, the beech, the lime, and other forest-trees. Several fruit-trees, among which are the apple, the pear, the cherry, and the plum, grow better in the northern half of this zone: while to its more southern parts, especially, belong the more delicate fruits, such as the olive, the lemon, the orange, and the fig, and, among trees, the cedar, the cypress, and the cork.

The space comprised between the 30th and the 50th parallels of latitude may be considered as the country of the vine and the mulberry. Wheat extends as far north as the 60th degree; oats and barley a few degrees farther. In the southern parts of this zone, maize and rice are more commonly cultivated.

The vegetation of the torrid zone is characterized by a wealth, a variety, and a magnificence, which are nowhere to be found in other regions of the globe. Under the beams of a tropical sun, the most juicy fruits arrive at perfection; and innumerable productions supply the wants and administer to the luxuries of man. There the grounds yield the sugar-cane, the coffee-tree, the palm, the bread-tree, the pisang, the immense baobab, the date, the cocoa, the vanilla, the cinnamon, the nutmeg, the pepper, the camphor, and numerous other fruits and aromatics. In South America is the remarkable tree called the *cow-tree*, which, when incisions are made in its trunk, yields abundance of a glutinous and nourishing milk.

CONCLUSION.

But we must hasten to conclude our interesting subject. Illustrations of design might be produced from the works of nature without end; every link in the chain of creation teems with proofs of it; in none can any one affirm with truth that it is wanting. Cursory as our remarks have been, they still must lead to the general conclusion, that not only design, but unity of design and identity of operation, pervade the works of nature, in as far as relates to organized existences; and even among those portions of creation which are not organic, there do we find the same evident desire and design to render them subservient to the wants and necessities of those which are. To several of these we have alluded, though it did not accord with our plan to allude to all, and we need only further draw attention to the remarkable uniformity in the plan of creation. The universe itself is a system; each part depending upon other parts, or being connected with other parts by some common law of motion, or by the presence of some common substance

One principle of gravitation causes a stone to drop towards the earth, and the moon to wheel round it. One law of attraction carries all the different planets round the sun. New countries are continually discovered, but the old laws of nature are always found in them—new plants, perhaps, or animals, but always in company with plants and animals which we already know, and always possessing many of the same general properties. We never get amongst such original or totally different modes of existence, as to indicate that we are come into the province of a new Creator, or under the direction of a different will. In truth, the same order of things attends us wherever we go. There is everywhere a perfect uniformity in the laws which regulate the phenomena of nature. And this very fact, while forcibly illustrating the unity of that power by whose instrumentality all that we see was ordered and originated, demonstrates most strikingly, at the same time, the surpassing wisdom of the same creative being. What agency, but one endowed with omniscience, could have educed results so mighty, from a few simple and uniform laws?—could have instituted and set in action these laws at the first, assured that, without change, or shadow of change, they would fulfil to the last all the great objects connected with the progressive development of the scheme of the universe? Thus, all that we behold around us, all that we can learn of nature, impresses us with a sense at once of the unity and greatness of the creative being. If these pages have tended to strengthen that conviction, they have attained their object. We cannot close them more fitly, perhaps, than by extracting a few lines from the powerful summing-up by the poet Young of the arguments on this very subject.

"What am I? and from whence?—I nothing know,
But that I am: and since I am, conclude
Something eternal: had there e'er been nought,
Nought still had been: eternal there must be,
But what eternal?—Why not human race?
And Adam's ancestors without an end?
That's hard to be conceiv'd. Yet grant it true,
Whence earth and these bright orbs?—Eternal too?
Grant matter was eternal, still these orbs
Would want some other father;—much design
Is seen in all their motions, all their makes:
Design implies intelligence, and art;
That can't be from themselves, or man: that art
Man scarce can comprehend, could man bestow?
Who motion, foreign to the smallest grain,
Shot through vast masses of enormous weight?
Who bade brute matter's restive lump assume
Such various forms, and gave it wings to fly?
Has matter innate motion? then each atom,
Asserting its indisputable right
To dance, would form a universe of dust:
Has matter none? Then whence these glorious forms
And boundless flights, from shapeless, and reposed?
Has matter more than motion?—has it thought,
Judgment, and genius?—is it deeply learn'd
In mathematics? Has it fram'd such laws,
Which but to guess a Newton made immortal?—
If so, how each sage atom laughs at me,
Who think a clod inferior to man!
If art to form, and counsel to conduct,
And that with greater far than human skill,
Resides not in each block—a Godhead reigns
And if a God there is, that God how great!"

HISTORY OF THE BIBLE—CHRISTIANITY.

Paul preaching at Athens.

OLD TESTAMENT.

The Bible is the most remarkable work now in existence. In the libraries of the learned there are frequently seen books of an extraordinary antiquity, and curious and interesting from the nature of their contents; but none approach the Bible, taken in its complete sense, in point of age, while certainly no production whatever has any pretension to rival it in the dignity of composition, or the important nature of the subjects treated of in its pages. The word *Bible* is of Greek origin, and, in signifying simply *the Book*, is expressive of its superiority over all other literary productions. The origin and nature of this every way singular work—how it was preserved during the most remote ages, and how it became known to the modern world in its present shape—form a highly interesting chapter of literary history.

The Bible comprehends the foundation of the religious belief of the Jews and Christians, and is divided into two distinct portions, entitled the Old and New Testament, the former being that which is esteemed by the Jewish nation, but both being essential in forming the faith of the Christian. The Old Testament is the largest department of the work, and appears a collection of detached histories, moral essays, and pious poetical compositions, all placed together in the order of time, or as they may serve for the purpose of mutual illustration. On taking a glance at the contents, the principal subject of narration seems to be the history of the Jews, commencing with an account of the creation of the world, and tracing their history, genealogically, through a series of striking vicissitudes and changes of situation. But when we examine the narratives minutely, it is found that there is another meaning than that of a mere historical elucidation. It is perceived that the whole train of events recorded, the whole of those lofty impassioned strains of poetry which distinguish the volume, are precursory and prophetic of a great change which, at a future period, was to be wrought on the moral character and fate of mankind, by the coming to the earth of a Messiah.

The authorship of the Old Testament has been universally ascribed, by both Jews and Christians, to pious men who were inspired or influenced by God to communicate to the world a correct knowledge of the foundations of religious belief and moral obligation. The Bible is hence called the Revealed Word of God, or the Sacred Scriptures. "We are to look to the Word of God, then, (says an able writer), as contained in the Scriptures of the

Old and New Testaments, for the only sure rule of faith and practice. But there is this singularity in the Sacred Scriptures, that we do not find in them a set treatise on any one of the interesting subjects which engage our attention as moral and religious beings. No attempt is made to prove the existence of a God; such an attempt would have been entirely useless, because the fact is universally admitted. The error of men consisted not in denying a God, but in admitting too many; and one great object of Scripture is to demonstrate that there is but one. No metaphysical arguments, however, are employed for this purpose. The proof rests on facts recorded in the history of the Jews, from which it appears that they were always victorious and prosperous so long as they served Jehovah, the name by which the Almighty made himself known to them; and uniformly unsuccessful, when they revolted from him to serve other gods. What argument could be so effectual to convince them that there was no God in all the earth but the God of Israel? The sovereignty and universal providence of the Lord Jehovah, are proved by predictions delivered by the Jewish prophets, pointing out the fate of nations and of empires, specifying distinctly the cause of their rise, the duration of their power, and the reason of their decline; thus demonstrating that *one* God ruled among the nations, and made them the unconscious instruments of promoting the purposes of his will.

"The writers, generally speaking, do not reason, but exhort and remonstrate; they do not attempt to fetter the judgment by the subtleties of argument, but to rouse the feelings by an appeal to palpable facts. But though there is no regular treatise in the Scriptures on any one branch of religious doctrine, yet all the materials of a regular system are there. The word of God contains the doctrines of religion in the same way as the system of nature contains the elements of physical science. In both cases, the doctrines are deduced from facts, which are not presented to us in any regular order, and which must be separated and classified before we can arrive at first principles, or attain to the certainty of knowledge; and in both cases, a consistent system can only be made out by induction and investigation. The very circumstance of no detailed system being given, renders it necessary to form one; for although a portion of religious and physical knowledge sufficient for the common purposes of life may be obtained by traditional information, and men may work conveniently enough by rules without possessing much general knowledge; yet they who would teach with profit must generalize, and they who would explain the ways of God must arrange, the materials which are so amply furnished, but which are presented apparently without order or plan."*

The periods when the act of writing all or greater part of the Scriptures took place, as well as most of the names of those who were instrumental in forming the work, have been ascertained with considerable accuracy, both from written evidence in the narratives themselves, and from the well-preserved traditions of the Jews. Generally speaking, it cannot be said that the books of the Old Testament are of a less antiquity than from two thousand three hundred to four thousand years—an antiquity considerably greater than that of any profane history. At whatever time, however, the different books were written, they were not collected from the sacred depositories of the Jews, where they had been carefully placed, till long after their immediate authors were deceased; and their present arrangement, as we shall afterwards explain, is of comparatively modern date.

From an early period, it was the custom of the Jews to divide the books of the Old Testament into three classes, which they respectively designated the *Law*, the *Prophets*, and the *Hagiographa*, or *Holy Writings*, which last division includes more particularly the *poetical* parts and some are of opinion that Jesus Christ alludes to this division of the Scriptures, when he says that "all things must be fulfilled that were written in the *Law of Moses*, and in *the Prophets*, and in *the Psalms*, concerning him." For by the book of *Psalms* they understood all the books of the third class. *The Law* comprehends the *Pentateuch*, that is, Genesis, Exodus, Leviticus, Numbers, and Deuteronomy—such including both a historical narrative, and the injunctions forming the legal code of the Jews. The prophetical books are eight: namely, 1. *Joshua*; 2. *Judges*, with *Ruth*; 3. *Samuel*; 4. *Kings*; 5. *Isaiah*; 6. *Jeremiah*; 7. *Ezekiel* and 8. *the twelve Lesser Prophets*. The first four books of this division are called *the Former Prophets*, and the last four *the Latter Prophets*. *The Hagiographa*, or *Holy Writings*, are nine, namely; 1. *Job*; 2. *the Psalms*, 3. *the Proverbs*; 4. *Ecclesiastes*; 5. *the Song of Songs*; 6. *Daniel*; 7. *Chronicles*; 8. *Ezra*, with *Nehemiah*; and 9. *Esther*.

According to the order in which the books of the Old Testament now stand, those of an historical nature are appropriately placed at the beginning. The first five books, having a chain of connection throughout, are Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. These are styled the *Pentateuch*, such being the Greek compound for *five books*. They are likewise entitled the Books of Moses, from the belief that that enlightened Jewish leader composed them.

The Jews, or Hebrews, take the name of the sacred books from the first word with which each begins; but the Greeks, whom our translators generally follow, take the names from the subject-matter of them. Thus, the first book is called by the Hebrews *Bereshith*, which signifies *In the beginning*, these being the first words; but the Greeks call it *Genesis*, which signifies *Production*, because the creation of the world is the first thing of which it gives an account. It likewise contains an account of the increase of mankind; of their corruption of manners, and its cause; of their punishment by the Deluge; of the origin of the Jewish people from Abraham; of the manner in which God was pleased to have them governed; and, particularly, of the nature of the special superintendence vouchsafed to the Jewish nation by the Creator. This comprehensive narrative reaches from the creation of the world to the death of Joseph, or a period of 2369 years. (See article CHRONOLOGY.)

Exodus, the title of the second book of Moses, signifies in Greek, *The going out*, and was applied from the account which it gives of the Israelites going out of Egypt. In it are related the cruel Egyptian slavery under which the Jews groaned; their delivery by flight, and a passage through the Red Sea; the history of the establishment of their very peculiar law, and many remarkable transactions; concluding with the building of the Tabernacle, or place appropriated to the service of the Divinity. This book comprises the history of 145 years, from the death of Joseph till the building of the Tabernacle. The Hebrews call it *Veelle Shemoth*, that is, in English, *These are the names*, which are the words with which it begins.

The third book of Moses is called *Leviticus*, because it contains the laws which God commanded should be observed by those of the tribe of *Levi* who ministered at the altar. It treats at large of all the functions of the Levites; of the ceremonial of religion; of the different sorts of sacrifices; of the distinction of clean and unclean beasts; of the different festivals; and of the year of jubilee, or continued holiday. It likewise presents us with an account of what happened to the Jews during the space of one month and a half; that is, from the time the Tabernacle was erected, which was the first day of the first month of the second year after the Israelites came out of Egypt, till the second month of the same year, when God commanded the people to be num-

* Edinburgh Encyclopædia, article THEOLOGY.

bered. The Hebrews call this book *Vayicre*, that is, *And he called*, these being the first words; they call it also the *Law of the Priests*.

In the fourth book, which we call *Numbers*, Moses numbers the Israelites, and that, too, in the beginning of the book, which shows whence it had its name. The Hebrews call it *Voyedaber*, that is, *And he spake*. This book contains the history of all that passed from the second month of the second year after the Israelites came out of Egypt, till the beginning of the eleventh month of the fortieth year; that is, it contains the history of thirty-nine years, or thereabouts. In it we have also the history of the prophet Balaam, whom the King of the Midianites brought to curse the people of God, and who, on the contrary, heaped blessings upon the Israelites, and foretold the coming of the Messiah. It particularly mentions, also, the two-and-forty encampments of the Israelites in the wilderness.

The fifth book is called *Deuteronomy*, a Greek term, which signifies *The second law*, or rather, *The Repetition of the Law*, because it does not contain a law different from that which was given on Mount Sinai; but it repeats the same law, for the sake of the children of those who had received it there, and were since dead in the wilderness. The Hebrews call it *Elle-haddebarim*, that is, *These are the words*. Deuteronomy begins with a short account of what had passed in the wilderness, and then Moses repeats what he had before commanded, in Exodus, Leviticus, and Numbers, and admonishes the people to be faithful in keeping the commandments of God. After this, he relates what had happened from the beginning of the eleventh month to the seventh day of the twelfth month of the same year, which was the fortieth after their leaving Egypt. The discourse which is at the beginning of this book was made to the people by Moses on the first day of the eleventh month. According to Josephus, he died on the first day of the twelfth; and the Israelites, the Scripture says, mourned for him in the plains of Moab thirty days, and, consequently, during the whole of the twelfth month.

The Jews call the Pentateuch *the Law*, without doubt, because the law of God, which Moses received on Mount Sinai, is the principal part of it; and it is little to be doubted whether that great man was the writer of the Pentateuch. This is expressly declared both in Exodus and Deuteronomy. But as an account of the death of Moses is given in the last eight verses of this book, it is therefore thought that these verses were added either by Joshua or Ezra. The opinion of Josephus concerning them is very singular; he assumes that Moses, finding his death approaching, and being willing to prevent an error into which the veneration the people had for him might cause the Jews to fall, wrote this account himself; without which the Jews would probably have supposed that God *had taken him away*, like Enoch.

After the death of Moses, Joshua, by the order of the Divine Being, took upon himself the conducting of the Hebrew people, and succeeded Moses, to whom he had been a faithful servant, and by whom he had been instructed in what he ought to do. It is uncertain whether the book which contains the history of this successor of Moses be called *Joshua*, from the subject of it, or from his having been the writer of it. But it is certain that it contains an account of what passed from the death of Moses to that of Joshua. Nevertheless, there are several things in it which did not come to pass till after the death of this great man, and which, consequently, could not have been written by him. The common opinion as to the length of time it contains is, that Joshua discharged his office only for seventeen years, and that, therefore, this book contains no more than the history of that number of years.

After the death of Joshua, the Israelites were governed by magistrates, who ruled under the general designation of *Judges*; and the book which contains the history of these rulers is called the *Book of Judges*. This history begins with the death of Josnua, and reaches to that of Samson. We here see the people of God often enslaved in punishment of their crimes, and often wonderfully delivered from slavery. Towards the end of it, we have some instances of this people's inclination to idolatry, and of the corruption of their manners, even before they had been brought into slavery. Such are the histories of Micah, and of the Benjamites who abused the Levite's wife. This book contains the history of about three hundred years.

During the time of the government of Judges, there was a great famine in the land of Israel, which forced Elimelech, a native of Bethlehem, to retire into the land of Moab, with his wife Naomi and two children. Elimelech died there, as also his two sons, who had married two Moabitish women, one of whom was named Ruth. Naomi, after the death of her husband and her children, returned to Bethlehem, accompanied by Ruth, her daughter-in-law, who was there married to Boaz, Elimelech's near relation, and the heir to his estate. The book which contains this history is called the *Book of Ruth*. The beginning of it shows that it happened in the time of the Judges, but under which of them is not certainly known: some place it in the time of Shamgar or of Deborah. As to the writer of this book, some think that the books of Judges and Ruth were both written by Samuel; others attribute them to Hezekiah, and others to Ezra. The Jews place the book of Ruth among the five books which they usually read on all the festivals in the year. These five books are, the Song of Songs, Ruth, the Lamentations of Jeremiah, Ecclesiastes, and the book of Esther. In the Hebrew bibles they are printed or written apart by themselves, and are bound up together.

The four books following Ruth are called by the Greeks, and also in some Latin bibles, the *History of the Reigns*. Others call them all the *Books of Kings*, because they give an account of the establishment of the monarchy, and of the succession of the kings who reigned over the whole kingdom at first, and over the kingdoms of Judah and Israel after its division. At the beginning of these books is the history of the prophet Samuel, which gives light to that of the kings. The Jews call the first two of these books the *Books of Samuel*, perhaps because they contain the history of the two kings who were both anointed by Samuel, and because what is said of Saul in *the first*, and of David in *the second*, proves the truth of Samuel's prophecies. They give the name of the *Books of Kings* only to the other two, which in the Latin and French bibles are called the *third* and *fourth Books of Kings*.

The *first Book of Kings*, or the *first of Samuel*, contains the history of the high-priest Eli, of Samuel, and of Saul; and extends over a period of nearly eighty years.

The *second* contains the reign of David which is the history of about forty years. It is commonly believed that Samuel, Nathan, and Gad, were the writers of these two books; and indeed they are called, in the end of the first book of *Chronicles*, *David's historians*.

The *third*, or, according to the Hebrews, the *first Book of Kings*, begins with a relation of the manner in which Solomon came to the throne, and contains the whole of his reign. After that, an account follows of the division of the kingdom, and the history of four kings of Judah and eight kings of Israel. All these reigns, including that of Solomon, which occupies the first forty years, comprise the space of 126 years.

The *fourth* of these books contains the history of sixteen kings of Judah and twelve kings of Israel; and embraces a period of three hundred years. It likewise gives an account of the prophets who lived during this

time. It is quite uncertain who were the writers of the two last-mentioned books. They are, by some, attributed to Jeremiah or Ezra, but no very convincing proofs have been adduced in support of this opinion. It is evident, indeed, that these books form a varied collection of several particular histories.

The name of *Paralipomena*, which, in Greek, signifies the *history of things omitted*, is given to the two books which follow those of *the Kings*. These form, in fact, a supplement, containing what had been omitted in the *Pentateuch*, and the books of *Joshua*, *Judges*, and *Kings*, or rather they contain a fuller description of some things which had been therein only briefly related. Some give them the name of *Chronicles*, because they are very exact in mentioning the time when every transaction happened. We divide them into two books, as do also the Jews, who call them *Dibere Hayamim*, that is, an *Historical Journal*, the matters of which they treat having been taken from the Journals of the Kings. In the original language, however, the word *days* often signifies *the year*, and in this sense we may understand the term to signify properly *Annals*. The generally received opinion is, that Ezra was the compiler of these. In the *first* book, he begins with a succinct historical abridgment, from the creation of Adam to the return of the Jews from their captivity; and then he resumes the history of David, and carries it on to the consecration of Solomon, that is, down to the year before Christ, 1015. The history contained in the *second book* reaches down to the year before Christ, 536, when, upon the expiration of the seventy years of the captivity, Cyrus gave the Jews leave to return to their own country.

Ezra wrote the history of the return of the Jews from the captivity of Babylon into Judea. It is the history of about eighty-two years, from the year of the world 3468, when Cyrus became master of the eastern empire, by the death of his father Cambyses in Persia, and his father-in-law Cyaxeres in Media, to the year, 3550, which was the twentieth year of the reign of Artaxerxes, surnamed Longimanus. This book bears the name of Ezra, who was the writer of it.

The next book is a continuation of that of Ezra, and, therefore, it is by some called *the Second Book of Ezra*. It was Nehemiah, however, whose name it also bears, who wrote it, as is said, by the advice of Ezra. It contains the account of the re-establishment of Jerusalem, and of the Temple, and the worship of God. It is believed by some writers to be the history of about thirty-one years; but its chronology is exceedingly uncertain.

After this general history of the Jews, follow two histories of particular persons, namely, *Esther* and *Job*. The first contains the account of a miraculous deliverance of the Jews, which was accomplished by means of the heroine named Esther. The history of Job is not only a narration of his actions, but contains also the entire discourses which this pious man had with his wife and his friends, and is, indeed, one of the most eloquent and poetic books in the Holy Scriptures. It is uncertain who was the author.

Next to the *historical* books of Scripture, follow those of a moral nature. The first of these is the book of *Psalms*, which are likewise in some measure historical; for they recite the miracles which God had wrought, and contain, as it were, an abridgment of all that had been done for the Israelites, and that had happened to them. The Hebrews call them the *Book of Praises*, by which they mean, *of the praises of God*. The word *psalm* is Greek, and properly signifies the sound of a stringed instrument of music. The Hebrews sung the psalms with different instruments. We make but one book of them all, but the Hebrews divide them into five parts, which all end with the words *Amen*, *Amen*. Though the Psalms bear the name of David, yet they were not all composed by him: some of them are more ancient, and others are of a later date than his time; some of them being ascribed to Moses, Samuel, and Ezra. Speaking of the dedication of the second temple, Prideaux says, "In this dedication, the 146th, the 147th, and the 148th Psalms seem to have been sung; for, in the Septuagint versions, they are styled the *Psalms of Haggai and Zachariah*, as if they had been composed by them for this occasion; and this, no doubt, was from some ancient tradition; but in the original Hebrew, these psalms have no such title prefixed to them, neither have they any other to contradict it." It is not probable, however, that all those whose names they bear were the true authors of them: it is more likely that these are only the names of those to whom they were first given to sing.

After the Psalms are the *Proverbs*, which are a collection of moral sentences, of which Solomon was the writer. This name is given them by the Greeks, but the Hebrews call them *Misle*, that is *Parables*, or *Comparisons*; and the word may also signify *Sentences*, or *Maxims*. It is a collection of divine precepts, proper for every age and every condition of life.

The book which follows is also a *moral* one, and was likewise composed by Solomon. The Greeks call it *Ecclesiastes*, which answers to the name of *Koheleth*, which it bears in the Hebrew. Both these words signify, in our language, *a preacher*, or *one who speaks in an assembly*. In this book is given an admirable picture of the vanity of worldly expectations.

Among the *moral* books is also reckoned the *Song of Songs*; that is to say, according to the Hebrew manner of speaking, *a most excellent song*. It is an inspired production of Solomon, in the allegorical form of an *epithalamium*, or nuptial song significant of the marriage and fellowship between Christ and his people: "Its majestic style, its power on men's consciences to promote holiness and purity, the harmony of its language with that of Christ's parables, and of the book of Revelation; the sincerity of the bride in acknowledging her faults, and, in fine, its general reception by the Jewish and Christian church, sufficiently prove its authenticity."—*Brown*.

In regard to the Prophets, it may be observed, that all the Old Testament is considered to be in substance one continued prophecy of the coming of a Messiah; so that all the books of which it consists are understood to be in some sense *prophetical*. But this name is more especially given to those books which were written by persons who had a clearer knowledge of futurity, who forewarned both kings and people of what would happen to them, and who, at the same time, pointed out what the Messiah was to accomplish, whom they who are acknowledged to have been prophets had always in view; and this is what ought most especially to be taken notice of in their writings.

The Prophecies bear the names of those to whom they belong. Some learned men are of opinion that the Prophets made abridgments of the discourses which they had written, and fixed them up at the gates of the Temple, that all the people might read them; and that after this the ministers of the Temple might take them away, and place them among the archives, which is the reason why we have not the prophecies in the order in which they were written. But the interpreters of Scripture have long since laboured to restore that order, according to the course of their history.

The works of the Prophets are divided into two parts, the first of which contains *the Greater*, and the second, *the Lesser Prophets*. This distinction, of course, does not apply at all to the persons of the prophets, but only to the bulk of their works. *The Greater Prophets* are Isaiah, Ezekiel, Daniel, and Jeremiah. *The Lamentations* of Jeremiah make a separate book by themselves, containing that prophet's descriptions of the destruction

of the city of Jerusalem and of the captivity of the people. *The Lesser Prophets* are Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habbakkuk, Zephaniah, Haggai, Zechariah, and Malachi. They were formerly contained in one single volume, which the Hebrews call *Thereaser*, which means *Twelve*, or *the Book of the Twelve*.

The dates of many of the prophecies are uncertain, but the earliest of them was in the days of Uzziah, King of Judah, and Jeroboam the Second, his contemporary, King of Israel, about two hundred years before the captivity, and not long after Joash had slain Zechariah, the son of Jehoiada, in the court of the temple. Hosea was the first of the writing prophets, and Joel, Amos, and Obadiah published their prophecies about the same time.

Isaiah began his remarkable prophecies a short time afterwards, but his book is placed first, because it is the largest of them all, and is more explicit respecting the advent of Christ than any of the others. The language of this eminent writer is exceedingly sublime and affecting; so much so, that it has never been equalled by any profane poet either in ancient or modern times. It is impossible to read some of the chapters without being struck by the force of the prophetic allusions to the character and sufferings of the Messiah; and in consequence of these prevailing characteristics, the author is ordinarily styled the *Evangelical Prophet*, and by some of the ancients, a *Fifth Evangelist*. The Jews say that the spirit of prophecy continued forty years during the second Temple; and Malachi they call the Seal of the Prophecy, because in him the succession or series of prophets broke off, and came to a period. The book of Malachi, therefore, appropriately closes the sacred record of the Old Testament.

By referring to our historical sketch of the Jewish people,* it will be observed that the glory of Israel vanished at the period of the conquest and captivity of the nation, about six hundred years before Christ. As a consequence, though not an immediate one, the inspired writings of the Old Testament were concluded soon after this event, or probably four hundred years before the coming of the Messiah. Thus a period of from four to five centuries elapsed from the time when Malachi concluded his prophetic enunciations, till that in which the Evangelists penned the books descriptive of Christ's life and ministrations.

NEW TESTAMENT.

The second and lesser division of the Bible, as has been said, relates entirely to the Christian religion, or the fulfilment of that which was predicted and prefigured in the more ancient department of the work. This division of the Sacred Scriptures is generally styled the *New* Testament, or that which has been a later revelation and bequest; that portion of it which relates to the history of the life of Christ is called the *Gospel*, and by some the *Evangel*, both these words having the same meaning, and implying *good news*, or *glad tidings*, from the circumstance that the narratives contain an account of things which are to benefit mankind.

The New Testament, like the Old, is a compilation of books written by different inspired individuals, and all put together in a manner so as to exhibit a regular account of the birth, actions, and death of Christ—the doctrines to be promulgated—and the prophecies regarding the future state of the church which he founded. The historical books are the four *Gospels* and the *Acts of the Apostles*, all these being of the character of narratives of events; the doctrinal are the Epistles of Paul, and some others; the prophetic book is the last, and is called the *Revelations* or *Apocalypse of St. John*, having been written by that apostle while he was in the island of Patmos.

The four Evangelists, or writers, are Matthew, Mark, Luke, and John; these having, as is generally believed, been companions of Christ during his ministrations, and therefore personally acquainted with his life and character. Each of the four books is principally a repetition of the history of Christ, yet they all possess a difference of style, and each mentions some circumstances omitted by the others, so that the whole is essential in making up a complete life of the Messiah. These distinctions in the tone of the narratives, and other peculiarities, are always considered as strong circumstantial evidence in proof of their authenticity, and of there having been no collusion on the part of the writers. But, indeed, the events they record are detailed in so exceedingly simple and unaffected a manner, that it is impossible to suppose that they were written with a view to impose on the credulity of mankind. The veracity and actual belief of the Evangelists themselves are placed beyond a doubt.

The first book is written by Matthew, who was by birth a Jew, and exercised the profession of a publican—that is, a collector of the public tax or assessment imposed upon the Jewish people by their conquerors the Romans. Matthew, who was also called by the name of Levi, was one of the twelve apostles of Christ, and he is said to have written his narrative from thirty to forty years after the departure of his Master from the earth. Many of the ancients say that he wrote it in the Hebrew or Syriac language; but it is more probable that there were two originals—one in Hebrew, and the other in Greek, the former written A. D. 37 or 38, and the latter A. D. 61: and that these were respectively designed for the Hebrew and Gentile nations.

With regard to Mark, the writer of the second Gospel, it may be observed, that although Mark and Marcus was a common Roman name, there is reason to believe that this Evangelist was a Jew, who had changed his original appellation on being converted to the faith of Christ. Jerome says, that, after the writing of this Gospel, he went into Egypt, and was the first that preached the Gospel at Alexandria, where he founded a church, to which he offered an example of holy living.

The Gospel of St. Mark is much shorter than that of Matthew, not giving so full an account of Christ's sermons as that did, but insisting chiefly on his miracles; and in regard to these also, it is very much a repetition of what we have in Matthew, many remarkable circumstances being added to the incidents they related, but not many new matters. There is a tradition that it was first written in Latin, because it was written at Rome; but this is generally thought to be without foundation, and that it was written in Greek, as was St. Paul's epistle to the Romans, the Greek being the more universal language. The Gospel of Mark was written at a somewhat later period than that of Matthew.

Luke, the name of the third Evangelist, is considered by some to be a contraction of *Lucilius*; and he is said by St. Jerome to have been born at Antioch. Some think that he was the only one of all the penmen of the Scriptures that was not of the Israelites; that he was a Jewish proselyte, and was converted to Christianity by the ministry of St. Paul at Antioch; and that, after the coming of Paul into Macedonia, Luke was his constant companion. He had employed himself in the study and practice of physic; and hence Paul calls him *Luke the beloved Physician*. It is deemed probable that Luke wrote both his gospel and his narrative of the *Acts of the Apostles* at Rome, when he was there a prisoner with Paul, *preaching in his own hired house*—circumstances alluded to at the conclusion of the latter work. If this be the case, Luke's Gospel may be dated about thirty years after Christ's departure, or A. D. 63. Jerome

* See article HISTORY OF THE JEWS—HOLY LAND—ARABIA PETREA.

says that St. Luke died when he was eighty-four years of age and that he was never married. Dr. Cave observes, that "his way and manner of writing are accurate and exact, his style polite and elegant, sublime and lofty, yet perspicuous; and that he expresses himself in a vein of purer Greek than is to be found in the other writers of this sacred history." Thus he relates several things more copiously than the other Evangelists, and thus he especially treats of those things which relate to the priestly office of Christ.

The fourth Evangelist, John, was one of the sons of Zebedee, a fisherman of Galilee, the brother of James, one of the Twelve Apostles, and distinguished by the honourable appellation of *that disciple whom Jesus loved.* The Ancients tell us that John lived longest of all the Apostles, and was the only one of them who died a natural death, all the rest suffering martyrdom. It is now established that he wrote his Gospel about the year 97 or 98, when he was of an extremely old age.

After the Gospel or History of Jesus Christ, follows the history of what passed after his ascension and was transacted by the Apostles. The book, therefore, which contains this history, is called the *Acts of the Apostles.* It is a history of the rising church for about the space of thirty years. It was written, as has been already observed, by St. Luke the Evangelist, when he was with St. Paul at Rome, during his imprisonment there. In the end of the book he mentions particularly his being with Paul in his dangerous voyage to Rome, when he was carried thither a prisoner; and it is evident that he was with him when, from his prison there, Paul wrote his epistles to the Colossians and Philemon, for in both of these he is named by him.

Next to this come the *Epistles of St. Paul*, which are fourteen in number; one to the Romans; two to the Corinthians; one to the Galatians; one to the Ephesians; one to the Philippians; one to the Colossians; two to the Thessalonians; two to Timothy; one to Titus; one to Philemon; and one to the Hebrews. They contain that part of ecclesiastical history which immediately follows after what is related in the Acts. The principal matter contained in them is the establishment or confirmation of the doctrine which Jesus Christ taught his disciples. According as the difficulties which raised disputes among the Christians, or the heresies which sprang up in the church from the first age of it, required, St. Paul in these epistles clears up and proves all matters of faith, and gives excellent rules for morality. His epistles may be considered as a commentary on, or an interpretation of, the four books of the Gospel.

The epistle to the *Romans* is placed first, not because of the priority of its date, but on account of its superlative excellence, it being one of the longest and fullest of all, and, perhaps, also, on account of the dignity of the place to which it is addressed. It is gathered from some passages in the epistle, that it was written in the year of Christ 56, from Corinth, while Paul made a short stay there in his way to Troas. He was then going up to Jerusalem, with the money that was given to the poor saints there; which is spoken of in the fifteenth chapter of the epistle.

The two Epistles to the *Corinthians* were written about a year after that to the Romans, viz. A. D. 57; that to the *Galatians*, A. D. 56; to the *Ephesians*, A. D. 61; to the *Philippians*, A. D. 62; to the *Colossians*, A. D. 63; wo to the *Thessalonians*, A. D. 51 and 52; the first to *Timothy*, A. D. 64; the second to *Timothy*, A. D. 66; to *Titus*, A. D. 65; to *Philemon*, A. D. 62; and that to the *Hebrews*, A. D. 62. From which chronology it appears, that the epistles of St. Paul are placed in the New Testament rather according to the dignity of the cities to which they were sent, than according to the order of time in which they were written; for the epistles to the Thessalonians were those he wrote first, though that to the Romans is placed before them. Interpreters are agreed that the last epistle which he wrote was the second to Timothy.

St. Paul wrote to the churches of some particular places, or to some particular persons; but the other epistles which follow his are called *catholic*, that is (universal), because, with the exception of the second and third of St. John, they were not addressed to any particular church or individual, as his were, but to the whole church in general. These are—one of St. James; two of St. Peter; three of St. John; and one of St. Jude.

The date of most of these epistles is extremely uncertain, but the most generally received chronology of them is as follows:—That of St. James, A. D. 61; of St. Peter, A. D. 66 and 67; of St. John, A. D. 80 and 90; of St. Jude, A. D. 66.

It has sometimes occurred to the minds of well-disposed persons, that it would have been better for Christianity had there never been any other record of its origin and doctrines than the writings of Matthew, Mark, Luke, and John. But, however plain and satisfactory the histories of these Evangelists may be, and however little they admit of controversy, it may, on the other hand, be observed, that the strong arguments and illustrations brought forward in the epistles by Paul and others, were necessary in order to combat the sophistry of the Greeks and the self-sufficient philosophies of other nations. Paul, the chief of the epistle writers, who became a Christian by conversion, after Christ had departed from the earth, is the great champion of the faith, and exposes, in strong and perspicuous language, the hidden depravities of the human heart; so that, where the affecting discourses and sufferings of the Messiah failed to convert and convince, the reasoning of this great writer is calculated to silence and subdue those who stubbornly resist the benignant influence of the Christian faith.

Such, then, were the various books written to convey to posterity a faithful account of Christ's life and mission, and consequently of the religion which it was his purpose to institute. It will have been observed, that the whole were inscribed within the first century, and gradually accumulated in the hands of the primitive church, as an imperishable basis on which the faith of Christians should be founded.

AUTHENTICITY OF THE SCRIPTURES.—APOCRYPHA.

With respect to the authenticity of both the Old and New Testament books, as generally received, we of course look to the estimation in which they were respectively held by those with whom they had been deposited, and who unquestionably possess the best evidences of their credibility. The Jews, as is well known, were most scrupulous in preserving entire the works of their inspired writers, and of preventing the intrusion of literal errors into the copies which were from time to time transcribed. Of the fidelity of the original text, there cannot, we think, be any reasonable doubt, and although there are what are called various readings, these are of an exceedingly unimportant character. Referring to this subject, it is said by the learned Dr. Adam Clarke, "that all the omissions of the ancient manuscripts, put together, would not countenance the omission of any essential doctrine of the gospel, relative to faith or morals; and all the additions countenanced by the whole mass of manuscripts already collated, do not introduce a single point essential either to faith or morals, beyond what may be found in the Complutensian or Elzevir editions." Among other means adopted by the Jews to preserve the integrity of the Scriptures, was that of noting and recording the exact number of words, verses, points, and accents, in each book. The duty of doing so was the province of the Jewish doctors or learned men, called Masorites. By these acute grammarians, all

the verses of each book and of each section were numbered, and the amount placed at the end of each in numerical letters, or in some symbolical word formed out of them; the middle verse of each book was also marked, and even the very letters were numbered; and all this was done to preserve the text from any alteration, by either fraud or negligence. For instance, Bereshith, or Genesis, is marked as containing 1534 verses, and the middle one is at—"And by thy sword thou shalt live," (xxvii. 40.) The lines are 4395; its columns are 43, and its chapters 50. The number of its words is 27,713, and its letters are 78,100. The Masoritic notes, or Masorah, as the work is called, contain also observations on the words and letters of the verses; for instance, how many verses end with the letter *samech*; how many there are in which the same word is repeated twice or thrice; and other remarks of a similar nature.

It seems now generally agreed upon that the Masorites of Tiberias, during the fourth century of the Christian era, were the inventors of the system of the *vowel-points and accents* in the Hebrew Bible; and although they multiplied them very unnecessarily, it must be allowed that they were an improvement of considerable importance. From the *points* we learn how the text was read in their time, as we know they were guided in affixing them by the mode of reading them which then prevailed, and which they supposed to have been traditionally conveyed down from the sacred writers.

The respect which the Jews have uniformly paid to the sacred books, has been almost allied to superstition. They are directed to be written upon parchment, made from the skin of a clean animal, and to be tied together with strings of a similar substance, or sewn with goats' hair which has been spun and prepared by a Jewess. It must be likewise a Jew that writes the Law, and they are extremely diligent and exact in it, because the least fault profanes the book. Every skin of parchment is to contain a certain number of columns, which are to be of a precise length and breadth, and to contain a certain number of words. They are to be written with the purest ink, and no word is to be written from memory; it must be first orally pronounced by the copyist. The name of God is directed to be written with the utmost attention and devotion, and the transcriber is to wash his pen before he inscribes it on the parchment. If there should chance to be a word with either a deficient or a redundant letter, or should any of the prosaic part of the Old Testament be written as verse, or *vice versa*, the manuscript is vitiated. No Hebrew manuscript with any illumination is, on any account, admitted into a synagogue, although private individuals are permitted to have them ornamented for their own use; but in the illustrations, the resemblance of any animal denounced by the Jews as unclean cannot be admitted. Among the modern Jews, the book of Esther, in particular, is frequently decorated with rude figures of various kinds; but with respect to this book, it must be observed that, owing to its wanting the sacred name of God, it is not held in such repute for holiness as the other books are. The manuscripts for private use may be either upon parchment, vellum, or paper, and of various sizes. "There is," says Prideaux, "in the church of St. Dominic, in Bononia, a copy of the Hebrew Scriptures, kept with a great deal of care, which they pretend to be the original copy, written by Ezra himself; and, therefore, it is there valued at so high a rate, that great sums of money have been borrowed by the Bononians upon the pawn of it, and again repaid for its redemption. It is written in a very fair character, upon a sort of leather, and made up in a roll, according to the ancient manner; but its having the vowel-points annexed, and the writing being fresh and fair, without any decay, both these particulars prove the novelty of that copy."

To open and shut up the roll or book of the Law, to hold it, and to raise and show it to the people, are three offices, which are sold, and bring in a great deal of money. The skins on which the Law is written are fastened to two rollers, whose ends jut out at the sides beyond the skins, and are usually adorned with silver; and it is by them that they hold the book when they lift it up, and exhibit it to the congregation; because they are forbidden to touch the book itself with their hands. All who are in the synagogue kiss it, and they who are not near enough to reach it with their mouths, touch the silken cover of it, and then kiss their hands, and put the two fingers with which they touched it upon their eyes, which they think preserves the sight. They keep it in a cupboard, which supplies the place of the ark of the covenant, and they therefore call this cupboard *Aron*, which is the Hebrew name for the *Ark*; and this is always placed in the east end of the synagogue. He who presides chooses any one whom he pleases to read and explain the Scripture, which was a mark of distinction, as we see in the thirteenth chapter of *the Acts*, where we find *the rulers of the synagogue* desiring the Apostles, when they were in the synagogues, to make a discourse to the people. Ordinarily speaking, a *priest* began, a *Levite* read on, and at last one of the people, whom the president chose, concluded. He who reads stands upright, and is not suffered so much as to lean against the wall. Before he begins, he says with a loud voice, *Bless ye God*, and the congregation answers, *Blessed be thou, O say God; blessed be thou for ever*; and when the lesson is ended, the book is rolled up, and wrapped in a piece of silk.

Certain books, collectively termed the *Apocrypha*, are sometimes included in the Bible, and of these it is necessary to give a brief account. The term Apocrypha is Greek, signifying *hidden* or *concealed*, and is applied to those books whose origin is unknown, or the authenticity of which is either doubtful or absolutely denied. Some writers divide the sacred books into three classes—the canonical, the ecclesiastical, and the apocryphal. In the first they place those whose authority has never been questioned in the catholic or universal church; in the second, those which were not received at first, but which were nevertheless read in the public assemblies, as books that were useful, though they never placed them upon the same footing of authority as the former; and in the third, they placed the books which were of no authority, which could not be made to appear in public, but were kept *hidden*, and were therefore called *apocryphal*, that is, *concealed*, or such as could not be used in public. "Let us lay aside those books which have been called *apocryphal*," says St. Augustine, "because their authors were not known to our fathers, who have, by a constant and certain succession, transmitted down to us the authority and truth of the Holy Scriptures. Though some things in these apocryphal books are true, yet as there are in them multitudes of others which are false, they are of no authority."

The Apocrypha consists of *fourteen* books, namely, *First* and *Second Esdras*, *Tobit*, *Judith*, the rest of the chapters of the book of *Esther*, the *Wisdom of Solomon*, *Ecclesiasticus*, *Baruch*, the *Song of the Three Holy Children*, the *History of Susanna*, the *Story of Bel and the Dragon*, the *Prayer of Manasses*, and the *First and Second Book of the Maccabees*. Biblical historians assert that these books were of a later composition than the other parts of Scripture, never existed in the proper Hebrew tongue, and were at no time received by the Jews as the writings of inspired men. It is the general belief of such Scripture critics as have made this subject their study, that the whole or greater part of the Apocrypha was written between the time of the Babylonish captivity and the appearing of Christ, and by persons who had mixed with the Greeks and other foreign nations. The apocryphal books, it is observed, are never quoted in the New Testament, or by the Jewish writers Philo

and Josephus; and by the early councils of the Church they were formally excluded from the canon. On these points, however, as is well known, there exists a great difference of opinion—the Roman Catholic Church viewing the apocryphal books as canonical, and the Protestants entirely setting them aside, or using them only as works of ordinary edification, or for the light which they throw on the phraseology of Scripture and the history and manners of the East. With respect to the meaning and application of the term *canonical*, we have appended a note beneath.*

While attempts have been made to intrude uncanonical books into the authentic body of ancient Scripture, the New Testament has been exposed to similar vitiation. In the third and fourth centuries, there were gospels forged by divers sects, and published, one under the name of St. Peter, another of St. Thomas, another of St. Philip, &c. But they were never owned by the church, nor was any credit given to them, as the learned Dr. Whitby shows. And he gives this good reason why we should adhere to records written at or near the time of Christ—"Because," says he, "whatever the pretences of tradition may be, it is not sufficient to preserve things with any certainty, as appears by experience. For whereas Christ said and did many memorable things, which *were not written*, tradition has not preserved any one of them to us, but all is lost except what was written; and that, therefore, is what we must abide by."

What has been said of the integrity of the text of the Old Testament, may be applied also to the New, in as far as it may be charged with corruptions in consequence of the negligence of transcribers. Though it must be admitted that the New Testament text, by being more frequently transcribed than the Old, became liable to a greater proportion of various readings, originating from the mistakes of the transcribers, yet this very circumstance was likewise a sure protection against wilful perversion or corruption; for, in proportion as copies were multiplied, the difficulty of effecting a general corruption was increased. No such system as that of Masorites was ever adopted to preserve the purity of the New Testament text; but we have it in our power to use various means for ascertaining what is the true reading of the text, without having recourse to such a plan as that of the Masorah; and Concordances, which are now brought to an uncommon degree of perfection, are of great use in preserving it from corruption. It need only be added, that we have the consent of the church, in all ages and countries, to prove the fidelity of the New Testament Scriptures, and any variety occurring in the readings in modern times can arise only from heedlessness, or motives of an improper kind.

With respect to the credibility, on general grounds, of the New Testament writers, and that the books are of that antiquity usually assigned to them, there cannot be any reasonable doubt; in other words, the writers wrote the books in perfect good faith, believing that what they penned was true, and the very books are those now before us in the New Testament. On these points, an able divine remarks:—"It must be esteemed a strong circumstance in favour of the antiquity of the New Testament, that on a subject in which the chances of detection are so numerous, and where we can scarcely advance a single step in the narrative without the possibility of betraying our time by some mistaken allusion, it stands distinguished from every later composition, in being able to bear the most minute and intimate comparison with the contemporary historians of that period. The argument derives great additional strength from viewing the New Testament, not as one single performance, but as a collection of several performances. It is the work of no less than eight different authors, who wrote without any appearance of concert, who published in different parts of the world, and whose writings possess every evidence, both internal and external, of being independent productions. Had only one author exhibited the same minute accuracy of allusion, it would have been esteemed a very strong evidence of his antiquity. But when we see so many authors, exhibiting such a well-sustained and almost unexpected accuracy through the whole of their varied and distinct narratives, it seems difficult to avoid the conclusion, that they were either the eye-witnesses of their own history, or lived about the period of its accomplishment."*

A minor point in the history of the Bible now requires to be noticed. In the earliest times the writings of the Old Testament were divided into books and short paragraphs equivalent to verses; but the division into chapters and verses in which they now appear was of a much later date. The separation of both the Old and New Testament books into chapters and verses, is by some writers ascribed to Arlott, a Tuscan monk, or rather to Hugh Cardinalis in the thirteenth century; while others allege that, from the comments of Theophylact on the Gospel, this must have been effected two centuries earlier. The question is not very important, and it is sufficient for the purposes of general knowledge to be informed, that the divisions of the Scriptures into chapters and verses was the work of a Roman Catholic divine some time between the eleventh and thirteenth centuries.

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* The meaning of this term will be gathered from the following explanations in the *Encyclopædia Americana* (Conversations Lexicon):—"The term *canon* (Greek) signifies a measure, rule, or standard; thence canon is used to denote the rule or standard of primitive Christianity. The same term is employed to designate the collection of books containing this rule, that is, the canonical books of the Holy Scriptures which the Church acknowledges. The canon of the books of the Old Testament, as drawn up by the Jews in the fourth century before Christ, receives in this form equal respect among all Christians, because Christ and his apostles have expressly appealed to them, and pronounced them writings inspired by God. The apocryphal books of the Old Testament, whose canonical character the Jews did not acknowledge, the Eastern [or Greek] Church has never received; but the Western [or Roman] Church declared them canonical, in the African council, about the end of the fourth century." What follows is said to be the explanation of a Catholic. "The Holy Scriptures are esteemed sacred by the Catholics, because the Church has transmitted them from age to age as sacred, and illustrative of revelation, as far as any writings can be. The Church has only declared what writings have been handed down as of divine origin. The catalogue of these Holy Scriptures is the canon; the writings themselves are called canonical books. In this sense, the Protestant Church has no canon; it rejects the authority of all traditions of the Church. Hence, in order to be consistent, it must leave every Protestant, on free investigation, to decide what books he will regard as canonical. But the Bible, the pillar of the Protestant faith, is made up of separate canonical books; and by pursuing such a course, the basis of the Protestant faith might be undermined. It has been agreed, therefore, however inconsistently, to adopt the New Testament canon of the Catholic Church. But, in fixing the canon of the Old Testament, the decisions of the Catholic Church have been rejected; and, contrary to the African councils and the usage of the Romish Church, established by the Council of Trent, part of Esther, also Baruch, Tobit, Judith, Wisdom, Ecclesiasticus, or Jesus the son of Sirach, the two books of Maccabees, the Song of the Three Youths in the Fiery Furnace, described in Daniel, together with the last two chapters of this prophet, are thrown out as uncanonical or apocryphal. It is worthy of mention, that a controversy on this subject broke off the negotiations for a union of the Catholic and Protestant Churches, which commenced in the beginning of the eighteenth century between Leibnitz, Molanus, and Bossuet." The above explanation is scarcely correct, as respects the Protestant idea of the canon of Scripture. The church of England, for example, does not implicitly adopt the Roman Catholic canon: it founds its rule of faith on that which is believed to have been the canon in the earliest centuries of Christianity. "The Church of England, in determining the sense of the Bible, listens with respect to the voice of the most ancient fathers and doctors; and not only with respect, but even with submission, where that voice is all but unanimous."—*Life of Jewel.* "The Council of Trent confirmed the decision of some previous councils, by which the books of the Apocrypha were declared to belong to the canon of the Old Testament; contrary to that of the council of Laodicea, A. D. 364, which, by an express canon, sanctioned the catalogue of the sacred books as received by Protestants."—*Josiah Conder's View of all Religions.*

* Edinburgh Encyclopædia, article CHRISTIANITY.

MODERN HISTORY OF THE BIBLE.

It will have been gathered from the preceding details, that the books of the Old Testament were originally written in the Hebrew language, that being the tongue spoken by the ancient Jewish people; and that the books were inscribed on rolls or sheets of carefully prepared parchment, and deposited only in the Temple, or preserved in the hands of the highest officers of religion. In this condition, and either in the Hebrew or Chaldaic tongue, they existed till translated into the language of the Greeks, under the name of the Septuagint. With respect to the exact period at which this translation was effected, history presents no uniform account. The translation is ordinarily assigned to seventy Jewish elders or interpreters—and hence the term *Septuagint*, which signifies seventy—who were employed by the Egyptian ruler, Ptolemy Philadelphus, to furnish a copy of the Scriptures in Greek, a language with which he and his people were acquainted. Whether the narration of this circumstance, which is said to have occurred 277 years before the Christian era, be conformable with credible history, it is at least certain that the translation called the Septuagint was effected by Jews skilled in the Greek tongue, at about the time specified, and it was afterwards held in high esteem by the Sanhedrim at Jerusalem. It may further be explained, that it was this Greek version of the Scriptures which was always quoted by our Saviour and his apostles, whenever they made an appeal to the sacred writings. With the earliest organization of the Christian church may be said to have commenced a new era in the history of the Bible. The Old Testament books, whether in the form of Hebrew, Chaldaic, or Greek versions, were still cherished by the Hebrew priesthood as they are at this day; but copies were likewise accessible to the early Christians, and by these pious apostles and disciples they were treasured as the prophetic testimony of God's eternal design for the salvation of mankind, in the grand event which had now actually occurred—the coming of Jesus Christ.

When the books of the New Testament were collected and authenticated by the early fathers and other members of the Christian church, they were held in equal esteem with those of the Old, and carefully preserved along with them. Though still in detached manuscripts, they were generally in the Greek tongue; but, during the first three centuries of our era, Latin, or the language of the Romans, came largely into use in literature, and, in the same manner as the modern European languages in later times superseded the Latin, so did the Latin supersede the Greek. Augustine (born 354—died 430) mentions that, previous to his time, there existed a great number of Latin versions of the Scriptural writings. "We know those who translated the Scriptures into *Greek*," says he, "and the number of them is not great; but the number of the *Latin* translators is infinite. When the faith came to be established, the first man who found a Greek copy, notwithstanding the little knowledge he had of the two languages, boldly undertook a translation of it." From another passage of his writings it has been generally concluded that there was one particular version, called "the Italian," in higher estimation than the rest, and which was the authorized version of the Roman churches. However this may be, it is certain that the Latin church required a version of the Scriptures formed directly from the Hebrew, as all the Latin translations in existence at that time had been taken from the SEVENTY. Jerome, who was the contemporary of Augustine, was in every respect best suited, of [illegible] of the learned men of that time, to the task of effecting a new translation, which he accordingly undertook. He began by correcting some books of the Old Testament in the Latin Bible, particularly the version of the Psalms, and marked those passages wherein any difference existed between the Latin version, the Greek of the Seventy, and the Hebrew original. He had early applied himself to the study of the Hebrew language, and at different periods had the assistance of five Jewish teachers; he had access, also, to the works of Origen, who published what is called the *Hexapla*, that is, the Bible in *six* different languages. From these he must have derived considerable assistance in the work he undertook—that of translating into Latin all the books of the Old Testament, to which he added a corrected edition of the common version of the New.

The work thus ascribed to Jerome (or St. Jerome, as he is ordinarily called) received the name of the *Vulgate*, and both by Christians and Jews has been considered a faithful translation. It was sanctioned by the Council of Trent, since which time corrected editions have been published under the authority of the Pope Sextus V. and Clement VIII. By the Roman Catholic body it is held in the highest esteem, and is reckoned equivalent in value to the Scriptures in the original tongues.

This seems to us the most proper place to notice—what must be clear to every one's comprehension—that, for the safe custody and verification of the Scriptures, from the period at which the New Testament books were collected, we are indebted to the Church, or, to speak more plainly, that series of ecclesiastical functionaries whose history is extended from the apostolic times till the present. Until the Bible, therefore, was secured to the people by the greatest of all mechanical applications, the art of printing, and in that respect placed beyond the reach of private interpolation or error, its safety, as a record, was dependent on the care and affection of the church, and for the faithful performance of that important service, no one surely will refuse a due meed of thankfulness and praise. From motives no doubt conscientious, many who have now the Bible in their hands may consider the Church a valueless institution; but to this incorporation are they unquestionably indebted for preserving the Scriptures through ages of persecution and civil uproar. From the era of Augustine and Jerome, when copies of the sacred books came into considerably greater request by the scattered branches of the Church, transcripts were effected by priests and latterly by monks, with a diligence and accuracy which demand our utmost esteem and approbation. In the cells of monasteries, surrounded by hordes of barbarous nobles and their serfs, learning found refuge from oppression; and there, in the darkest ages of European history, were humble and pious ecclesiastics engaged, certainly from no worldly consideration, in penning copy after copy of the Sacred Writings, and bequeathing them as memorials of their industry to future and more fortunate generations.

Both before and after the application of printing to multiply copies of the Bible, translations, either direct from the original tongues or from the Greek versions, were effected by almost every people to whom Christianity was introduced. Thus, copies of the Scriptures in Arabic, Persian, Sclavonic, and other tongues were produced. One of the most ancient of these is that translated for the use of the Armenian Christians in the fifth or sixth century.* [illegible] Scriptures are

* "For the more commodious comparison of different versions, many of them have been sometimes joined together. In his eightfold Bible, Origen placed, in different columns, a Hebrew copy, both in Hebrew and in Greek characters, with six different Greek versions. Elias Hutter, a German, about the sixteenth century, published the New Testament in twelve languages, namely, in Greek, Hebrew, Syriac, Latin, Italian, Spanish, French, German, Bohemian, English, Danish, Polish; and the whole Bible in Hebrew, Chaldaic, Greek, Latin, German, and a varied version. But the most esteemed collections are those in which the originals and ancient translations are conjoined, such as the Complutensian Bible, by Cardinal Ximenes, a Spaniard; the King of Spain's Bible, directed by Montanus, &c.; the Paris Bible, by Michael Jay, a Frenc

understood to have been translated into Anglo-Saxon, for use in the first British churches, as early as the sixth or seventh centuries; and the whole Bible was translated by Bede, an eminent Romish ecclesiastic, in the beginning of the eighth century. The first English Bible we read of was that translated by Wickliffe, one of the earliest English reformers, about the year 1360, but never printed. The part of the English Bible first printed was the New Testament, translated by William Tindal, assisted by Miles Coverdale; it was printed abroad in 1526, but, giving offence to the church, was bought up and burnt. "In 1532, Tindal and his associates finished the whole Bible except the Apocrypha, and printed it abroad: but while he was afterwards preparing for a second edition, he was taken up and burnt for heresy in Flanders. On Tindal's death, his work was carried on by Coverdale, and John Rogers, superintendant of an English church in Germany, and the first martyr in the reign of Queen Mary, who translated the Apocrypha, and revised Tindal's translation, comparing it with the Hebrew, Greek, Latin, and German, and adding prefaces and notes from Luther's Bible. He dedicated the whole to Henry VIII. in 1537, under the borrowed name of Thomas Matthews; whence this has been usually called *Matthews's Bible*. It was printed at Hamburgh, and license obtained for publishing it in England by the favour of Archbishop Cranmer and the Bishops Latimer and Shaxton. The first Bible printed by authority in England, and publicly set up in churches, was the same Tindal's version, revised, compared with the Hebrew, and in many places amended, by Miles Coverdale, afterwards Bishop of Exeter, and examined after him by Archbishop Cranmer, who added a preface to it; whence this was called *Cranmer's Bible*. It was printed by Grafton, was of large size, and published in 1540; and, by a royal proclamation, every parish was obliged to set one of the copies in its church, under the penalty of forty shillings a month; yet, two years after, the bishops obtained its suppression by the king. It was restored under Edward VI., suppressed again under Queen Mary, and restored again in the first year of Queen Elizabeth, and a new edition of it given in 1562. Some English exiles at Geneva, in Queen Mary's reign, namely, Coverdale, Goodman, Gilbie, Sampson, Cole, Whittingham, and Knox, effected a new translation, printed there in 1560—The New Testament having been printed in 1557—hence called the *Geneva Bible*; containing the variations of readings, marginal annotations, &c., on account of which it was much valued by the Puritan party in that and the following reigns. Archbishop Parker resolved on a new translation for the public use of the church, and engaged the bishops and other learned men to take each a share or portion. These being afterwards joined together, and printed with short annotations in 1568, in large folio, made what was afterwards called the *Great English Bible*, and commonly, the *Bishop's Bible*. In 1589, it was also published in octavo, in a small but fine black letter: and there the chapters were divided into verses; but without any breaks for them, in which the method of the Geneva Bible was followed, which was the first English Bible where any distinction of verses was made. It was afterwards printed in large folio, with corrections, and several prolegomena, in 1572: this was called *Matthew Parker's Bible*. The initial letters of each translator's name were put at the end of his part. The archbishop overlooked, directed, examined, and finished the whole. This translation was used in the churches for forty years, though the Geneva Bible was more read in private houses, being printed above twenty times in as many years."

Various editions of the Bishop's Bible were printed at London in black letter at the beginning of the seventeenth century; but notwithstanding the care that had been expended on it, the version was not very correct, and its language was often far from elegant. To amend these deficiencies, and to obtain a really excellent version, James I. ordered an entirely new translation, which is that now in common use throughout Great Britain. To effect this very important undertaking, forty-seven distinguished scholars were appointed, and divided into six classes. Ten at Westminster were to translate to the end of 2d Kings; eight at Cambridge were to finish the remaining historical books and the Hagiographa; at Oxford, seven were engaged on the Prophets, eight upon the four Gospels, the Acts of the Apostles, and the Apocalypse: the Apocryphal books were to be translated at Cambridge. Each individual translated all the books allotted to his class; the whole class then compared all the translations, and adopted the readings agreed on by the majority. The book, thus finished, was sent to each of the other classes. Three years were consumed in this arduous duty of translating and examining. Copies were then sent to London, one from each of the abovenamed places. Here a committee of six, one from each class, reviewed the whole, which was last of all revised by Doctor Smith, and Doctor Bilson, Bishop of Winchester. Having received the approbation of the king, himself no mean scholar, it was printed in 1611. We are not informed by any writer, whether the translation was effected from Hebrew copies of the Old Testament or the Greek Septuagint, or whether any transcriptions of the original manuscripts were consulted;* but it is allowed by all persons competent to judge, that the version possesses extraordinary merit, and is the most perfect ever produced.

CHRISTIANITY.—HISTORY OF THE CHURCH.

Early History.

At the period of Christ's appearance on earth,† the land of Judah had sunk to the condition of a Roman province, and its people, the Jews, were in a condition not only of civil but of great moral degradation. Their religion, as appears from all history, had degenerated from its ancient and lofty character, and existed only as a system of empty external observances in the hands of a priesthood to the last degree corrupt. The leaders of the people, and the chief priests, according to the account of Josephus, were persons of profligate manners, who had purchased their places by bribes or by acts of iniquity, and who maintained their authority, in subordination to the Roman civil power, by flagitious crimes. The multitude, affected by the example of their superiors, were not less corrupted in morals; and in a general sense it may be understood that the entire nation was

gentleman, in ten large folio volumes, copies of which were published in Holland, under the name [or sanction] of Pope Alexander VII., and that of Brian Walton, afterwards Bishop of Chester. This last is the most regular and valuable; it contains the Hebrew and Greek originals, with Montanus's interlineary version; the Chaldee Paraphrases, the Septuagint, the Samaritan Pentateuch, the Syriac and Arabic Bibles, the Persian Pentateuch and Gospels, the Ethiopic Psalms, Song of Solomon, and New Testament, with their respective Latin translations; together with the Latin Vulgate, and a large volume of various readings, to which is ordinarily joined Castel's Heptaglot Lexicon—all included in eight volumes folio."—*Brown's Dictionary of the Bible.*

Biblical scholars are now greatly assisted in their studies by the publication of polyglott editions of the Bible, containing in parallel columns versions in various ancient and modern languages. The word *polyglott* signifies many tongues.

* The most ancient manuscripts of the Bible, in the original Hebrew, are to be found among the Jews in Spain (or were so some years ago), but none of them is above seven or eight hundred years old: a manuscript in the Bodleian Library at Oxford is thought to be seven hundred years old; in the library of the Vatican at Rome there are manuscripts, we believe, of parts of the Old and New Testament, which are of considerable antiquity. The first edition of the entire Hebrew Bible was printed at Soncino in 1488: and the Brescian edition of 1494 was used by Luther in making his German translation.

† The term *Christ* is from the Greek, and signifies "the Anointed:" *Messiah*, from the Hebrew, has the same meaning.

in a state of lamentable disorder. To aggravate the distractions of the people, they were divided into a variety of sects, who, in proportion as they neglected the essentials of religious faith and practice, occupied themselves in disputes respecting matters of inferior concern. Of these sects, three in a great measure eclipsed the rest, both by the number of their adherents, and also by the weight and authority which they acquired: these were the Pharisees, the Sadducees, and the Essenes. The chief difference of opinion among these leading sects regarded the interpretation to be put on the *words* in the Holy Scriptures, and none of them seemed to have the interests of true piety at heart. The best of the three was the Essenes, who discountenanced ostentation in religious offices, and inclined to lives of secluded meditation. While the Jews, then, were thus broken up into contending sects, and were apparently in a state of profound ignorance of the true principles of religion, Jesus Christ appeared among them, to execute his divine mission, which referred not only to them but the whole human race. In the writings of the Evangelists we are furnished with so remarkably precise an account of the birth and public ministrations of Christ, as also of his death and passion, as to leave nothing to be said here on the subject; and we pass on to an enunciation of the principles which it was the object of his mission to accomplish, and an historical sketch of that universal society of believers, the Church, which he empowered to work out his designs.

Supposing Christianity, or the religion of Christ, to be reducible to a single principle, it might be described as an universal truth adapted to all mankind, and of a divine, all-uniting power—a principle of love and universal brotherhood, without respect of nation, age, rank, colour of skin, or any other exterior circumstance; in short, a system of faith and practice for the whole human race. A religion to be so universally applicable should necessarily embrace no tenet or observance which required special localization. Judaism required a periodic visitation to the Temple at Jerusalem; Mohammedanism requires the performance of pilgrimages to certain cities in Arabia, also attention to forms only suitable to the daily and seasonal influences of a warm climate; Hindooism enjoins constant ablutions in the Ganges, besides other local observances—all which mark these religions as but referable to certain nations and countries, and not compatible with modes of existence in all parts of the earth. Setting aside, for the present, all other considerations, Christianity, by including no obligation which could not be as well performed in one part of the globe as another, or as well in one age as another, is something very different from religions either temporary or local in their character. In this universal and eternal applicability, then, do we find one of the grandest features of the religion of Christ.

The promulgation of the principle of universal benevolence and love—the antagonism of every evil or violent emotion—was, whatever may be said of it, new to the Jewish people. True, they believed in one God, the Creator of all things, and so far had just views of the Source of religion; they also possessed the commandments of the Mosaic law; but when, on any occasion, did they view the Gentile nations, or foreigners, in any other light than as an inferior race of mankind, to whom their laws and usages had no sort of applicability? Practically, their religion narrowed the affections, while Christianity was all for widening them. "The Greeks, besides developing the principle of the beautiful in their works of art, had laid the foundations of valuable sciences applicable to the business of life. The Romans had established the principles of law and politics, administration, and proved their value by experience. These scattered elements of moral and intellectual cultivation, insufficient, in their disunited state, to bring about the true happiness and moral perfection of man, in his social and individual capacity, were refined, perfected, and combined, by Christianity, through the law of a pure benevolence, the highest aim of which is that of rendering men good and happy, like God, and which finds, in the idea of a kingdom of heaven upon earth, announced and realized by Christ, all the means of executing its design. His religion supplied what was wanting in these nations—a religious character to the science of Greece, moral elevation to the legislative spirit of Rome, liberty and light to the devotion of the Jews; and by inculcating the precept of universal love of mankind, raised the narrow spirit of patriotism to the extended feeling of general philanthropy. Thus, the endeavours of ancient times after moral perfection were directed and concentrated by Christianity, which supplied at the same time a motive for diffusing more widely that light and those advantages which mystery and the spirit of caste had formerly withheld from the multitude. It conveyed the highest ideas, the most important truths and principles, the purest laws of moral life, to all ranks; it proved the possibility of perfect virtue, through the example of its Founder; it laid the foundation for the peace of the world, through the doctrine of the reconciliation of men with God and with each other; and directing their minds and hearts towards Jesus, the Author and Finisher of their faith, the crucified, arisen, and glorified Mediator between heaven and earth, it taught them to discern the benevolent connection of the future life with the present."*

Systems of chronology differ with regard to the year of the crucifixion of the Saviour, some placing it in A. D. 30, and others in A. D. 33. In either case, as is known to the readers of the evangelical history, the apostles and disciples who had followed him while on earth began, shortly after his departure, those ministrations which they were commissioned to execute by their divine Master, and which had for their object the dissemination of the Gospel in all parts of the world. It will be further recollected, that, in consequence of the defection and death of the traitor Judas, the apostles were reduced to eleven in number—Peter, and Andrew his brother; James the son of Zebedee, and John his brother; Philip and Bartholomew; Thomas and Matthew; James the son of Alpheus, and Jude his brother; lastly, Simon the Canaanite. Afterwards, they elected Matthias in place of Judas. The number, however, was again reduced to eleven, by the murder of James, the brother of John, by Herod (A. D. 44).

The first society or church established by the apostles was at Jerusalem; and, from all that can be learned, it was on the most simple and unpretending scale, corresponding to the nature of the religion which they professed. One of Christ's most emphatic declarations had been that "his kingdom was not of this world," by which he signified that the Christian doctrines and graces referred exclusively to the mental affections, were a business of the heart, not of outward show or demonstration, and had in other respects no alliance with civil dominion. The humble but intrepid apostles, therefore, in the course of their preaching and teaching in Judea, and afterwards in other countries, took no part in any design to subvert temporal governments, or to bring them into contempt; neither did they seek to ally themselves with civil rulers, but confined themselves in all places to their proper functions of calling sinners to be converted to the faith of Jesus, comforting those who mourned, animating the piety of the dejected, and, in particular, assisting the poor and needy. Of the forms of Christian worship in this infant state of the Church, little is known; and, indeed, it appears that some time elapsed before the converted, or at least the pupils to the apostolic teachers,

* Encyclopædia Americana, article CHRISTIANITY

forsook the forms enjoined in the old Judaic mode of worship. According to Mosheim, they "held separate assemblies, in which they were instructed by the apostles and elders, prayed together, celebrated the holy supper in remembrance of Christ, of his death and sufferings, and the salvation offered to mankind through him; and at the conclusion of these meetings, they testified their mutual love, partly by their liberality to the poor, and partly by sober and friendly repasts, which thence were called *feasts of charity*. Among the virtues which distinguished the rising church in this its infancy, that of beneficence to the poor and needy shone in the first rank and with the brightest lustre. Having finished their work at Jerusalem, the apostles proceeded to other nations, and travelled over a great part of the known world, in a short time planting a vast number of churches among the Gentiles. Several of these are mentioned in the sacred writings, particularly in the *Acts of the Apostles*, though these are undoubtedly but a small part of the churches which were founded, either by the apostles themselves or by their disciples under their immediate direction."

It is not our design to enter into a formal detail of what constituted the various points of belief and religious practice in this early age of the Church. It will be understood that there was at first no body of written evidence answering as a fountain of doctrine and precept, such as we now possess in the collected books of the New Testament; and that apostles, and those who were raised up to assist them in their holy cause, were accordingly thrown much more on their own resources, and more dependant on God's inspiring power to teach and direct, than required to be the case in more advanced times. To use the words of Mosheim—"Among the first professors of Christianity there were but few men of learning; few who had capacity enough to insinuate into the minds of a gross and ignorant multitude the knowledge of divine things. God, therefore, in his infinite wisdom, judged it necessary to raise up, in many churches, extraordinary teachers, who were to discourse in the public assemblies upon the various points of Christian doctrine, and to treat with the people, in the name of God, as guided by his direction, and clothed with his authority. Such were the *prophets* of the New Testament."—(Rom. xiii. 6; 1 Cor. xii. 28; xiv. 3–29; and Eph. iv. 11.)

Much as we desire to do so, it is impossible for us to pass over a circumstance in the history of these early times, which has led to centuries of discord; we allude to the early form of church government. We shall allow a place to Mosheim's explanations on this subject. "Neither Christ himself, nor his holy apostles have commanded any thing clearly or expressly concerning the external form of the Church, and the precise method according to which it should be governed. From this we may infer, that the regulation of this was, in some measure, to be accommodated to the time, and left to the wisdom and prudence of the chief rulers, both of the state and of the Church. If, however, it is true that the apostles acted by divine inspiration, and in conformity with the commands of their blessed Master (and this no Christian can call in question), then it follows, that that form of government which the primitive churches borrowed from that at Jerusalem, the first Christian assembly established by the apostles themselves, must be esteemed as of divine institution. But from this it would be wrong to conclude that such a form is immutable, and ought to be invariably observed; for this a great variety of events may render impossible. In those early times, every Christian church consisted of the *people*, their *leaders*, and the *ministers*, or *deacons*; and these, indeed, belong essentially to every religious society. The people were, undoubtedly, the first in authority; for the apostles showed, by their own example, that nothing of moment was to be carried on or determined without the consent of the assembly, and such a method of proceeding was both prudent and necessary in those critical times.

"It was, therefore, the assembly of the people which chose their own rulers and teachers, or received them by a free and authoritative consent, when recommended by others. The same people rejected or confirmed by their suffrages the laws that were proposed by their rulers to the assembly, excommunicated profligate and unworthy members of the church, restored the penitent to their forfeited privileges, passed judgment upon the different subjects of controversy and dissension that arose in their community, examined and decided the disputes which happened between the elders and deacons, and, in a word, exercised all that authority which belongs to such as are invested with the sovereign power. The people, indeed, had in some measure purchased these privileges, by administering to the support of their rulers, ministers, and poor, and by offering large and generous contributions, when the safety or interests of the community rendered them necessary. In these supplies, each one bore a part proportioned to his circumstances, and the various gifts which were thus brought into the public assemblies were called *oblations*.

"The rulers of the church were called either *presbyters* or *bishops*, which two titles are, in the New Testament, undoubtedly applied to the same order of men. These were persons of eminent gravity, and such as had distinguished themselves by their superior sanctity and merit. Their particular functions were not always the same; for while some of them confined their labours to the instruction of the people, others contributed in different ways to the edification of the church. Hence the distinction between *teaching* and *ruling presbyters* has been adopted by certain learned men. But if ever this distinction existed, which I neither affirm or deny, it certainly did not continue long; since it is manifest that St. Paul requires that all bishops or presbyters be qualified and ready to teach and instruct.

"The Church was, undoubtedly, provided from the beginning with inferior ministers or *deacons*. No society can be without its servants, and still less such societies as those of the first Christians were. And it appears not only probable, but evident, that the *young* men, who carried away the dead bodies of Ananias and Sapphira, were the subordinate ministers, or *deacons* of the Church of Jerusalem, who attended the apostles to execute their orders. All the other Christian churches followed the example of that of Jerusalem in whatever related to the choice and office of the deacons.

"Such was the constitution of the Christian Church in its infancy, when its assemblies were neither numerous nor splendid. Three or four presbyters, men of remarkable piety and wisdom, ruled these small congregations in perfect harmony, nor did they stand in need of any president or superior to maintain concord and order where no dissensions were known. But the number of the presbyters and deacons increasing with that of the churches, and the sacred work of the ministry growing more painful and weighty by a number of additional duties, these new circumstances required new regulations. It was then judged necessary that one man of distinguished gravity and wisdom should preside in the council of presbyters, in order to distribute among his colleagues their several tasks, and to be a centre of union to the whole society. This person was at first styled the *angel* of the church to which he belonged, but was afterwards distinguished by the name of *bishop*, or inspector; a name borrowed from the Greek language, and expressing a principal part of the episcopal function, which was to inspect and superintend the affairs of the church. It is highly probable that the Church of Jerusalem, grown considerably numerous, and deprived of the ministry of the apostles, who were gone to instruct the other nations, was the first which chose a president or bishop. And it

is no less probable that the other churches followed by degrees such a respectable example. * * * A bishop, during the first and second century, was a person who had the care of one Christian assembly, which at that time was, generally speaking, small enough to be contained in a private house. In this assembly he acted, not so much with the authority of a *master*, as with the zeal and diligence of a faithful *servant*. He instructed the people, performed the several parts of divine worship, attended the sick, and inquired into the circumstances and supplies of the poor. He charged, indeed, the presbyters with the performance of those duties and services which the multiplicity of his engagements rendered it impossible for him to fulfil; but had not the power to decide or enact any thing without the consent of the presbyters and people. And though the episcopal office was both laborious and singularly dangerous, yet its revenues were extremely small, since the church had no certain income, but depended on the gifts or oblations of the multitude, which were, no doubt, inconsiderable, and were, moreover, to be divided between the bishops, presbyters, deacons, and poor.

"The power and jurisdiction of the bishops were not long confined to these narrow limits, but soon extended themselves, and that by the following means. The bishops who lived in the cities had, either by their own ministry or that of their presbyters, erected new churches in the neighbouring towns and villages. These churches, continuing under the inspection and ministry of the bishops by whose labours and counsels they had been engaged to embrace the gospel, grew imperceptibly into ecclesiastical provinces, which the Greeks afterwards called *dioceses*. But as the bishop of the city could not extend his labours and inspection to all these churches in the country and in the villages, so he appointed certain suffragans or deputies to govern and to instruct these new societies; and they were distinguished by the title of *chorepiscopi*, that is, country bishops. This order held the middle rank between bishops and presbyters, being inferior to the former and superior to the latter.

"The churches in these early times were entirely independent; none of them subject to any foreign jurisdiction, but each one governed by its own rulers and its own laws. For, though the churches founded by the apostles had this particular deference shown them, that they were consulted in difficult and doubtful cases, yet they had no juridical authority, no sort of supremacy over the others, nor the least right to enact laws for them. Nothing, on the contrary, is more evident than the perfect equality that reigned among the primitive churches; nor does there even appear in this first century the smallest trace of that association of provincial churches, from which *councils* and *metropolitans* derive their origin. It was only in the second century that the custom of holding councils commenced in Greece, from whence it soon spread through the other provinces."

According to these explanations, it would appear that the earliest constitution of the church was exceedingly simple, being in a great measure a confederacy of separate and independent religious instructors; that it gradually assumed the external features of Presbyterianism (equality of rank, but mutual jurisdiction); and that, finally, as Christianity spread, and the scattered societies of believers required the supervision and counsel of superiors, there arose a species of Episcopacy or superintendence by apostolic bishops. According to others, the bishops exercised a superintendence from the first, the earliest being the apostles; and it is reasonable to suppose that some such superior directors, exercising an authority in a spirit of perfect love, must have been necessary for the sake of order and uniformity of doctrine; it is at the same time certain that, whether in the capacity of equals or superiors, the apostles and early bishops performed the office ordinary teachers of religion. The commissioning of ministers of the gospel by ordination, or the symbol of laying on of hands, appears to have existed from the earliest ages of Christianity. The members of the church at Antioch, founded by Paul and Barnabas, were the first who received the name of *Christians*, having been previously called Nazarenes, by way of derision.

From about the conclusion of the first till the sixth century, there flourished a body of eminent men in connection with the Church, whose functions may be said to have generally united those of a professor of divinity and ethics with the pastoral office. These are known in Church History by the title of *Fathers*. They were of two chief classes—Greek and Latin fathers—and were alike distinguished for their erudition. The most celebrated among the Greek fathers was Clement of Alexandria (beginning of the second century), who was the first who philosophized on Christianity; Origen, at one time a pupil of Clement, celebrated for his homilies and writings illustrative of the Scriptures; Eusebius, who wrote the first history of Christianity; Athanasius (296–373), Bishop of Alexandria, and a man of invincible courage under persecution, whose writings exerted a considerable influence on the Christian dogmas; and Chrysostom (344–407), an ascetic, the most admired of ancient orators. The most distinguished among the Latin fathers were—Tertullian, born about the middle of the second century, and a writer of great originality; Augustine (354–430), a man of persuasive eloquence, exalted piety, and a warm encourager of the monastic life; Ambrose (340-397), Bishop of Milan, an eminent orator, and famed for his mild and humane character; and Jerome (331–420), one of the most learned writers and able expounders of the Scriptures, which, as formerly mentioned, he translated into the Latin tongue.

In the course of the second and third centuries, the history of the Church is painfully disfigured by the assumption of dominant powers by bishops; the division of the clergy into subordinate ranks and offices; the increase of ceremonial observances, fasts, and festivals; and, above all, differences of opinion among Christians on matters of belief. One main cause of the variety of opinion might be traced to the collateral influence of the Grecian philosophers, particularly that of Plato. Many converts had been educated in these philosophies, and though Christianized, they still retained the subtle speculative notions implanted in their minds, as well as divers Pagan usages. From disputing in the schools of Athens on questions in metaphysics, they betook themselves to controversies on the most abstruse points of theology. From controversy, the disputants naturally subsided into heresy and schism; and hence we find that, while the Christian Church was on all sides struggling against barbarous powers, it was itself torn by intestine division. In this general sketch, we can only mention that the leading sectaries at this period were the Manicheans, Hieracites, Sabellians, and Novatians; and in the fourth century the heresy of Arius broke out, and produced incalculable injury. Prior to this latter event, the external condition of the Church underwent an entire change.

For nearly three hundred years after the death of Christ, the Church, though gradually altering in internal organization, doctrinal belief, and ritual observance, was still an independent spiritual community, reposing on the simple but glorious basis on which it had been placed by its Divine Author, and in which condition it may be said to have been invulnerable. The conversion of Constantine the Roman Emperor, in 321,* at once altered the primitive state of the Church. "Before that important period, some churches had been liberally supported by the devotion and zeal of wealthy individuals: but yet the situation of the clergy was insecure and contemptible in the eyes of the Pagan world. Afterwards

* See HISTORY OF GREECE AND ROME in the present series

they lived in princely splendour, honoured and esteemed as the first rank of men in the empire. Formerly, they had been sunk in the gloom of obscurity, but now they basked in the broad sunshine of honour, wealth, and imperial favour. To a person who contemplates the aspect of the Roman empire in that age, a new world seems to appear. The system of polytheism and idol worship, which, from time immemorial, had, by its pompous ceremonies and splendid festivals, commanded the veneration of mankind, fell into disrepute: and Christianity, which had so long been the object of universal contempt, and frequently of cruel persecution, at last triumphed over all opposition, and became the established religion of the masters of the world. The Roman empire saw magnificent churches erected for the worship of the crucified God, whose name had been long despised, and the rites of the Christian religion celebrated with a pomp and solemnity equal, if not superior, to what had been displayed in the Pagan temples. A total revolution was taking place in the texture of religious opinions and the combinations of human ideas. What a scene would this have appeared to a Christian of the apostolic age, or of that which immediately succeeded it! What would a Christian whose mind had been formed, whose religious ideas had been modelled, by the simple and disinterested maxims of primitive Christianity, think, on seeing the ministers of the humble and lowly Jesus display the magnificence of sovereign princes! And what must have been his reflections on contemplating a system of honour and emolument, set up by the professed followers of one whose whole life was a continued scene of poverty and sufferings, and whose preaching and practice were entirely calculated to inspire all those who embraced his doctrine with a sovereign contempt for the things of this world! In the reign of Constantine the Church was enriched; but it evidently appears that the spirit of genuine Christianity was in a great measure extinguished. Ecclesiastical history, which had hitherto exhibited a horrible and sanguinary scene of the sufferings of the Church under Pagan persecutors, then began to display a not less disgusting view of the persecution of Christians by the hand of Christians, carried on with a cruelty little short, in some instances, of that which Pagans had before exercised against them."*

To extinguish, as far as possible, the heresy of Arius, and allay other causes of schism, Constantine convoked the celebrated Council of Nice (325), which consisted of 318 bishops, and other ecclesiastics to the number of 2048. After a session of two months, in which the emperor frequently assisted in person, the opinions of Arius, which went to a denial of the divinity of Christ, were condemned, the equality of the three Persons of the Holy and Undivided Trinity was declared the true doctrine, and, being comprised in a form of belief called the Nicene Creed, was published as the obligatory and only orthodox creed of the Christian Church.†

The deliberations of the Council of Nice failed in their main design, and the Arians, persecuted by the Church, dispersed themselves in distant nations, and there found a safe retreat. This may be viewed as the first great schism in the Church, which henceforth consisted, not in one, but in several distinct societies of believers. To trace minutely the progress of the respective branching-off communions, would lead us considerably beyond our limits; let it suffice to say, that in the fourth and fifth centuries, there were founded several important eastern churches. The Armenian Church dates its commencement from about the year 312. The Egyptian or Coptic Church originated in a heresy in the fourth century; and the Abyssinian Church shortly after branched off from it. The Syrian Church, in a similar manner, gave origin to the Syro-Indian Church, which still exists in Travancore and Cochin, and acknowledges as its head the Patriarch of Antioch. It is likewise to the fourth century that we must trace the origin of that great schism which afterwards divided the Church into the Western or Roman Church, and the Eastern or Greek Church. At this period, the Bishop of Rome occupied the first rank in the episcopal order, and on that account exerted a certain authority over all other bishops within the pale of the orthodox Church. "Constantine, by removing the seat of empire to Byzantium (Constantinople), raised up in the bishop of this new metropolis a formidable rival to the Roman pontiff. Accordingly, in a council held at Constantinople, in the year 381, by the authority of Theodosius the Great, the bishop of that city was, during the absence of the Bishop of Alexandria, and against the consent of the Roman prelate, placed in the first rank after the Bishop of Rome, and consequently above those of Alexandria and Antioch."—(*Mosheim.*) The rivalry and contentions of the bishops of Rome and Constantinople which ensued from this period, terminated in 1054 in a complete rupture. Each power excommunicated the other, and henceforth the Greek Church was entirely under the authority of the Patriarch of Constantinople. The other branch of the Church remained under the dominion of the Roman pontiff, and is that which is known by the name of the Roman Catholic Church.

Centuries before this latter event, the Church, under the generally recognised supremacy of the Bishop of Rome, had undergone the most extraordinary changes of condition. The legal establishment of Christianity as the religion of the state, and its consequent alliance with civil power, gave it a new character. That this authoritative recognition greatly aided in converting the pagan world, there can be no manner of doubt; but unfortunately, as we have seen, the wealth and authority conferred on churchmen naturally introduced evils gross in their nature; and in many respects the alliance with the civil government did infinitely more harm than good. Some writers aver that Christianity could scarcely have survived the dismemberment of the Roman empire and the barbarism that ensued throughout the middle ages, unless fortified by civil power; but this, we humbly submit, is but a timid view of the Christian dispensation, which surely required no such extraneous means of support. It is a lamentable truth, confirmed by every respectable historian, that the proceedings of Constantine (321), and afterwards of Theodosius (390), in establishing Christianity as the religion of the empire, laid the foundation of every species of ecclesiastical abuse, and directly caused the decay of that sublime but simple piety which was the ornament of the apostolic times. It is to

* Bigland's Letters on History.

† The Nicene Creed, after receiving some subsequent additions, stood as follows, and has for ages occupied a place in the Church service:—"I believe in one God, the Father Almighty, Maker of heaven and earth, and of all things visible and invisible: and in one Lord Jesus Christ, the only begotten Son of God, begotten of his Father before all worlds: God of God, Light of Light, Very God of Very God, being of one substance with the Father, by whom all things were made: who for us men, and for our salvation, came down from heaven, and was incarnate by the Holy Ghost of the Virgin Mary, and was made man, and was crucified also for us under Pontius Pilate: He suffered and was buried, and the third day he rose again according to the Scriptures, and ascended into heaven, and sitteth on the right hand of the Father, and he shall come again with glory to judge both the quick and the dead; whose kingdom shall have no end: And I believe in the Holy Ghost, the Lord and Giver of Life, who proceedeth from the Father and the Son, who with the Father and the Son together is worshipped and glorified, who spake by the Prophets: And I believe one Catholic and Apostolic church; I acknowledge one baptism for the remission of sins; and I look for the resurrection of the dead, and the life of the world to come. Amen."

With respect to the form of belief usually called the Apostles' Creed, it is believed to be of much less antiquity than the apostolic age, but there is great obscurity as to its authorship. It also has undergone alterations in the course of time. "The third creed, erroneously ascribed to Athanasius (who assisted at the Council of Nice, in 325), is affirmed to have been privately drawn up about the middle of the fourth century; and is rejected by all the Protestant churches (except the Anglican." —*Conder's View of all Religions.*

the arrangements consequent on the alliance of the Church with the civil power, that we have also to trace the origin of that new feature in ecclesiastical polity, the endowment of churches, cathedrals, abbeys, monasteries, and other institutions, with the functionaries belonging to them. But the most extraordinary change, both in the internal and external character of the Church, was the excess of power which, by the sanction of temporal princes, was accorded to the bishops of Rome. From early times, the occupant of the Roman primacy had been known under the title of *papas*, a Greek word signifying father, and hence the well-known terms, *papal* and *pope*. The pope, aided by his council, formed the head of the hierarchy, and acted as a supreme magistrate in all religious matters whatsoever. From the possession of the spiritual supremacy, a plea was easily found to assume the right of interfering in temporal concerns; and, as is known to the readers of history, the pope was allowed to exercise an almost unquestioned authority over the affairs of Christian princes for several centuries. It is at the same time proper to remark, that the lay and clerical members of the Church did not always agree in conceding this excessive power to the popes; the right of spiritual jurisdiction was not denied, but how far, and in what manner, that of a temporal nature, without the express sanction of general councils, should be allowed, formed a point of frequent debate, and we do not know that Catholics have yet arrived at a uniformity of opinion on the subject.

Another serious abuse which crept into the ecclesiastical affairs of the Church, was the establishment of monastic institutions—houses in which men secluded themselves from the world, and engaged themselves in religious offices. The practice of living as hermits, for the purpose of religious meditation, existed before Christianity, and was only engrafted upon it (in a regular manner) about the beginning of the fourth century; and in the course of the following hundred years, monasteries greatly increased in number. In the sixth century, the practice of taking vows of celibacy and rigid adherence to certain rules, was introduced by St. Benedict; from which period till the tenth century, monasteries are generally allowed to have been dwellings of piety, temperance, and the refuge of learning, driven to them for shelter from the troubles of the times. In the course of the tenth and eleventh centuries, the monasteries lost this valuable character. Idleness and luxury entered their walls, together with the vices of the world; their superiors, named abbots or priors, appointed by lay princes from among the nobility, set themselves above the jurisdiction of the bishops; and, in short, the whole monastic system, including convents for female devotees (nuns), became altogether corrupt. None of the religious orders rose to such eminence and power as the Society of Jesus, or Jesuits, founded by Ignatius Loyola (1491—1556), a Spaniard, and a man of great shrewdness and enthusiasm. The society was sanctioned by a bull (or ordinance) of Paul III. in 1560. Young men of ability and peculiar energy of character were alone admitted, and the trials of the novices were most severe. In addition to the usual vows of poverty, chastity, and implicit obedience to superiors, the members were bound to go, unhesitatingly and without recompense, whithersoever the pope should send them, as missionaries for the conversion of pagans and heretics, or for the service of the Church in any other way. This well-trained and formidable corps of spiritual combatants long exerted a powerful influence throughout Christendom, as well as in heathen countries; but as general intelligence advanced, they failed in their efforts; in 1773 their order was abolished by Clement XIV.; and latterly (though restored in 1814), they sunk into comparative obscurity.

The many flagrant corruptions of the Church began to excite the attention of reflecting men in the fourteenth century, and efforts were on divers occasions made by them to produce a reform, but without success. The abuses chiefly complained of were the scandalous lives of many of the clergy, particularly of the monastic and mendicant orders, the gross superstitious reverence generally paid to relics, the extravagant power of the pope, and the sale of indulgences. The exhibition of religious relics, with the view of exciting the piety of believers, had degenerated into a system of pure imposture. "The poor fragments of mortality, a skull, a bone, or the fragment of a bone, a tooth, or a tongue, were either mounted or set, according to the size, in gold and silver, deposited in costliest shrines of the finest workmanship, and enriched with the most precious gems. Churches soon began to vie with each other in the number and variety of these imaginary treasures, which were sources of real wealth to their possessors. The instruments of our Lord's crucifixion were shown (the spear and the cross having, so it was pretended, been miraculously discovered), the clothes wherein he was wrapt in infancy, the manger in which he was laid, the vessels in which he converted water into wine at the marriage feast, the bread which he broke at the last supper, his vesture for which the soldiers cast lots. Such was the impudence of Romish fraud, that portions were produced of the burning bush, of the manna which fell in the wilderness, of Moses's rod and Samson's honeycomb, of Tobit's fish, of the blessed Virgin's milk, and of our Saviour's blood!" —(*Southey.*)

The ludicrous extent to which the exhibition of relics was carried, and also the abstract claims of spiritual supremacy by the pope, might have been tolerated for some time longer; but the plenary power of selling immunities for transgressions roused the common sense of mankind. Leo X., famous for his love of splendour, commenced this odious traffic. Martin Luther (1483—1546), a monk of the order of Augustine, in Germany, was shocked with the effects of the system, as they appeared in his congregation at Wittemberg. "By far the most notable vender of indulgences was Tetzel, a Dominican, whose morals were on a par with his impudence. This man had popular talents: he was a ready, sonorous preacher; he was intimately acquainted with the human heart; and these advantages, joined to his dignity as prior of his order, pointed him out as the fittest person to sell these indulgences. He was accordingly made chief commissioner, and his success at the different towns he visited was prodigious. From the pulpit he declared indulgences to be the most sublime of God's favours; they had saved more souls than the efforts of all the Apostles; they would atone for every sin, however heinous; they were effectual in regard to future, no less than past transgressions; they stoned for the dead no less than the living; and whoever suffered his relatives to remain in purgatory, when a little money would release them, was guilty of the worst crime. Hence a blow was struck at all repentance: contrition of heart was out of the question, when pardon could be obtained on terms so much easier. The present recital would perhaps be disbelieved, if its truth were not virtually admitted by contemporary Roman Catholics. But good is often educed from evil; and this preaching of indulgences was one of the chief causes of the Reformation. There is reason to believe that the whole system struck Luther with horror from the very first; and that, coupled with the impiety which he had witnessed in the capital of Christendom, it provoked his doubts as to the infallibility of the papal authority. The effects of the indulgences were every day before his eyes; and, as one of the authorized confessors of the people of Wittemberg, he perceived them more clearly than other men. While seated in the tribunal of penance, he was amazed to hear what crimes had been committed, and still more, that no contrition was felt for them. He refused to absolve, unless

the criminals forsook their evil ways. They showed him their letters of impunity: no matter; he estimated these at their just value, namely, as so many pieces of waste paper. Being dismissed without absolution, and without admission to the sacraments, the deluded purchasers complained to Tetzel, who bellowed and threatened; but Luther was undaunted: he openly preached against the pernicious traffic; he attacked the very foundation on which it rested; he denied the power of pope or Church to remit the guilt of sin; and by his famous propositions, as everybody knows, rapidly produced the most gigantic change effected in this world since the origin of Christianity."*

The preaching of Luther, in exposing the error of indulgences, and in calling in question various traditional tenets and practices, speedily roused a large part of Germany; and as no symptom of relenting was shown by those in power, an extensive secession from the Romish Church became unavoidable. The year 1521 is to be regarded as the epoch of the Reformation in Germany; and from this period it became a political as well as religious movement—in a word, a movement in favour of civil and religious freedom. In consequence of a general *protest* being signed by the reforming party against a decree of the Diet of Spires, in 1529, they received, in 1541, the name of *Protestants*. Eleven years earlier, in 1530, a declaration of the principles of the reformers, drawn up by Melancthon, was presented to the Emperor of Germany at a diet held at Augsburg, and there solemnly read before the assembly; this famous declaration is known in history as the Confession of Augsburg. The Reformation spread from country to country with singular rapidity: the ancient church was deposed and one of a reformed character established in its place—in Switzerland and Genova in 1535; in Sweden and Denmark in 1536; in England in 1547; and in Scotland in 1560. In Austria, Italy, Spain, Portugal, and France, the efforts of the reformers were less successful, and in these countries the Roman Catholic Church has been established, or at least popular, till the present day.

CONCLUDING SUMMARY.

Christianity now exists, in one or other of its various forms, in all civilized countries, and numbers, as is believed, 260,000,000, out of 900,000,000, the entire population of the globe. Although originating in Asia, and flourishing for some time in the adjacent regions of northern Africa (Church of Alexandria, for example), it prevails only to a small extent in these continents, and is principally confined to Europe and the countries which have been peopled by European emigrants. Everywhere, it is the religion of *civilized man*, no other creed or form of belief being at all suitable to an advanced intelligence, or so directly calculated to inspire sentiments of refined piety, humanity, and justice. In the hands of uninstructed, ambitious, and intolerant men, its history abounds in the most odious crimes; but latterly, as its professors have fallen under the influence of a civilization to which it has itself largely contributed, and as the true principles of the Gospel have been better understood, our religion has not been outraged by indecent excesses either at home or abroad; while, by the earnest but unostentatious efforts of its supporters, of various denominations, it has been made favourably known in the most remote parts of the earth.

The forms in which Christianity is professed are very numerous, but the whole are comprehended in three leading systems—the Roman Catholic Church, the Eastern Churches, and the Protestant or Reformed Churches.†

With but one exception, all acknowledge the doctrine of the Trinity, the fall of man, salvation by the expiatory death of Christ, the resurrection, and a state of final rewards and punishments. Differences on other matters may be traced to two distinct causes of controversy: 1. Whether the rule of faith and practice is absolutely confined to the Holy Scriptures, or embraces a traditional revelation, sanctioned by councils and cherished by the

* Review of d'Aubigné's History of the Reformation.—*Athenæum* No. 571.

† *Roman Catholic Church.*—The doctrines and ritual of this body, as now professed, proximately rest in a great measure on the decisions of the Council of Trent (terminated 1563). According to these decisions, the Romish creed embraces the following points:—An admission of apostolical and ecclesiastical traditions; that the Holy Scriptures form only a part of revelation, and are to be interpreted only according to the sense in which they are held by the Church; that there are seven sacraments, necessary for the salvation of mankind, though not for every one—baptism, confirmation, eucharist, penance, extreme unction, clerical orders, and matrimony; that in the mass there is offered a true, proper, and propitiatory sacrifice for the living and the dead; and that in the holy sacrament of the eucharist, there is really, truly, and substantially, the body and the blood, together with the soul and divinity, of Christ (transubstantiation); that there is a place of purgation, or purgatory, into which souls proceed after death; that the saints, reigning together with Christ, are to be honoured and invoked; that they offer prayers to God for us, and that their relics are to be had in veneration: that the images of Christ, of the Virgin Mary, and also of the other saints, ought to be had and retained, and that due honour and veneration are to be given to them; that the power of indulgences was left by Christ to the Church, and that the use of them is most wholesome to the Christian people; that the Holy Catholic Apostolic Church is the mother of all churches, and that out of the Catholic faith none can be saved. To these principal matters of belief are added—the efficacy of prayers for the dead; auricular confession; celibacy of the clergy; the use of Latin in the public ministrations; signing with the cross; the rosary as an implement of devotion, &c.

The Roman Catholic Church is an episcopacy, or government by a hierarchy of bishops. The supreme control rests in the pope and his council at Rome, and thence radiates a system of management, most complete and effective, over all parts of Christendom. The church includes three distinct orders of clergy—bishops, priests and deacons; all others, such as cardinals (popes expectant), archbishops, deans, vicars, &c., belonging to one or other of these classes. The church claims the mark of true *apostolicity*, that is, an unbroken line of descent from the apostles and their divine Master. The ordination of priests is the engrafting them into this apostolic line of succession. Bishops alone ordain or communicate holy orders. In no church is the ritual of public worship so highly adorned, or rendered more imposing, by the dresses of the officiating priests, the waving of censers, crucifixes, pictures, images, and music. Although celebrated in an unknown tongue, it is observable that the public worship excites the greatest appearance of attention and decorum, as well as all the outward demonstrations of piety. The influence of the devotional feelings is said to be the object aimed at by the various outward insignia; the church (if we understand the argument) holding it to be of equal consequence whether the heart is touched, and feelings of piety and veneration are excited, by the exhibition of a crucifix or the preaching of a sermon. The Roman Catholic Church, though now only a remnant of its former self, is still the most numerous of the various Christian bodies: it includes within its pale, France, Belgium, Poland, Italy, the Mediterranean islands, Spain, Portugal, the greater part of the people of Austria and Ireland; about a half of the Prussians and Swiss, and the inhabitants of various German states; large numbers in the South American states and Mexico; also a part of the population of the United States, and nearly all the Lower Canadians; and a considerable number of the inhabitants of England and Scotland, besides those of inferior countries. Altogether the number of Roman Catholics is said to amount to 139,000,000.

The Eastern Church is divided into four leading communions, and several of a subordinate rank:—1. The Constantinopolitan or Orthodox Greek Church, comprising all who acknowledge the supremacy of the Patriarch of Constantinople. 2. The Russian Greek Church, which prevails over Russia, and in virtue of an ordinance of Peter the Great in 1700, was constituted the national church, having for its head the Russian emperor; it is governed by a council at St. Petersburgh. 3. The Anti-Byzantine or Monosphyte Churches, which have renounced communion both with the Constantinopolitan Church and Church of Rome, and differ from both in doctrine and ritual: these churches include the Syrian, Coptic, Abyssinian, Nestorian, Indo-Syrian, and Armenian Christians. 4. The Greek and other Eastern Christians, including the Maronites in Syria, who are in communion with the Church of Rome. The whole of these Eastern Churches are said to include 62,000,000 of members. Whatever be their peculiar differences, all recognise two sources of doctrine, the Holy Scriptures and Tradition, and are hierarchial episcopates in their form of government. The church service is in Greek. "The rites and ceremonies of the Greek church are exceedingly numerous, trivial, and burdensome. In all the services, except the communion, prayers and adorations are offered to the Virgin (styled the *Panagia*, all-holy), or to some of the multitudinous saints of the Greek calendar, almost as often as to the Deity. Every day in the year is consecrated to some saint, frequently to more than one: and every day of the week is appropriated in the church service to

church? 2. And who has the right to interpret the rule of faith—the church or individuals? On the exact determination of these points, rests a complex series of divisions, which at present appear to be as far from settlement to the mutual satisfaction of parties, as they were in the sixteenth century; and we may rationally conclude, that, humanly speaking, little or no advance to reconciliation can be effected, till education has dispelled the mists of prejudice, and enabled men to perceive and judge of abstract matters more equably.

some peculiar object of adoration."—*Conder*. This church does not resist the circulation of the Scriptures, and its clergy may be married men.

The Protestant Churches are either those which split off from the Church of Rome at the Reformation, or others which have since sprung from the reformed bodies. Protestantism owns two fundamental principles—that the Bible contains the sole rule of faith, and that it is the right of every one without respect of person, to judge of that rule with all the aids which divine grace, reason, and conscience, can inspire. At the same time, it may be noticed, that generally in practice each church possesses certain standards of belief to which it is expected its members will adhere. Rejecting traditional revelation and the decrees of all councils but those of an early date, Protestants admit only two sacraments, baptism and the Lord's supper. They reject transubstantiation and the sacrifice of the mass; deny the lawfulness of monastic vows, the holiness of celibacy, the merit of good works, the virtue of indulgences, the invocation of saints; reject the worship of images, auricular confession, extreme unction, purgatory, prayers for the dead, and the spiritual authority of the pope. Protestantism exists in three main divisions—Lutherans, Arminians, and Calvinists—each differing from the other in certain points of faith and church government; but there are, besides, innumerable sects which cannot be included in these bodies—as, for example, Quakers, or the Society of Friends, who reject the lawfulness of clerical functionaries, and disapprove of the sacraments and all ordinary forms of public worship—Baptists, a numerous body, with recognised pastors, who possess a very simple form of church government, repudiate infant baptism, and maintain the necessity of the baptism or immersion of adult believers—Moravians, a large and unobtrusive body, who, among other good qualities, display extraordinary ardour in the prosecution of missionary labours—Methodists, a numerous body in England, chiefly distinguished for their devotional fervour, the reformation of manners, and the instruction of the young in religious duties by means of Sunday-schools—and Unitarians, an intelligent and respectable body, but differing widely in doctrine from all other classes of Christians: who maintain, as their name imports, the absolute unity of God, in opposition to the doctrine of the Trinity, acknowledge no fixed creed or standard of faith except the Bible, and reject the doctrine of original sin, the vicarious sacrifice of Christ, and the eternity of future punishments. Unitarianism has made considerable progress in America during the last half century; and possesses a number of churches in Britain, Ireland, Geneva, Germany, and other parts of Christendom.

The total number of Protestants of all churches and sects is believed to be about 60,000,000.

Protestantism is professed in two chief forms—*Episcopacy*, or the government of the church by bishops, whose spiritual authority is derived from the apostles through the efficacy of ordination, both before and since the Reformation; and *Presbytery*, which rejects a hierarchy of bishops, and admits only the government of the church by a body of ministers all equal in rank. The body called *Independents*, or Congregationalists, only admit of each church being governed by its own members, on a primitive and simple model. At the head of the Protestant Episcopal churches may be placed the Church of England, whose doctrines are contained in the well-known Thirty-Nine Articles and in the Book of Common Prayer. The Church of England has for its basis a denial of the supremacy of the Bishop of Rome, and rejects the doctrine of purgatory, the doctrines concerning indulgences and pardons, the worship or veneration of images and relics, the invocation of saints, the sacraments of confirmation, penance, orders, matrimony, and extreme unction, transubstantiation, and the sacrifice of the mass. It retains confirmation as a religious ceremonial, ordination to the priestly office, the sign of the cross in baptism, burial service, kneeling at the communion, absolution of the sick, the whole hierarchical routine of officials—bishops, priests, deacons, prebends, archdeacons, rectors, vicars, &c., and numerous fasts and festivals. In its calendar affixed to the Book of Common Prayer, there are retained the names of about seventy saints of the middle ages, such as Hilary, Prisca, Valentine, Dunstan, &c. Practically, the church pays no attention to these, or to most of the authorized fasts, festivals, vigils, &c.

According to law, the reigning sovereign, whether king or queen, is the head of the church, and has the appointment of its bishops, who hold the dignity of spiritual peers, and are members of the legislature. From its strict connection with the state, the Church of England labours under the misfortune of possessing no power in itself to amend its formularies, which consequently remain what they were in the reign of Edward VI.; yet this great disadvantage is felt to be comparatively unimportant, on account of the extraordinary beauty and simplicity of the language of the prayers and litanies, as well as the elementary nature of the whole service, which admits of no alteration by officiating ministers. Latterly, a number of its clergy have manifested a strong desire to restore many forgotten ante-Reformation usages in the Church service—a circumstance which has given much offence to those of moderate views. Both in the United States of America and in Scotland, there are Episcopal communions deriving ordination from the Church of England, and having the same forms of worship. The Scotch Episcopal communion, in which the bishops officiate as ministers of congregations, and which is altogether dependent on the contributions of its adherents, is acknowledged to present the purest model of the Episcopacy which prevailed in the early ages of the Church.

Presbyterianism is established in Scotland, Holland, and some of the Swiss Cantons, and exists to a large extent in North America. Presbyterians generally follow the doctrines of John Calvin, rejecting the use of crucifixes, the sign of the cross, altars, liturgies, &c., and recognising no saints' days. Christmas and Easter are recognised by Presbyterians in Holland, but not by those in Scotland. The clergy, being equal in rank, are governed by provincial and general courts, constituted from their own body. Scotland possesses a numerous body of Presbyterian dissenters or seceders from the establishment; and, latterly, these have added to former causes of difference, by declaring their hostility to all connection between Church and State, and that Christianity, as was the case prior to the era of Constantine, should be entirely independent of civil government, and its ministers supported exclusively by voluntary contributions

LIFE AND MAXIMS OF FRANKLIN.

PARENTAGE AND BOYHOOD.

Benjamin Franklin was born at Boston, in New England, North America, on the 17th of January, 1706, and was the youngest but two of a family of seventeen children, two daughters being born after him. His ancestors, as far as they can be traced back (at least three hundred years), were petty freeholders at Eaton, in Northamptonshire; but if we may judge by the surname of the family—the ancient Norman appellative for a country gentleman—we may conclude they had originally been of some consequence. After the Reformation, the immediate progenitors of Benjamin continued zealously attached to the Church of England till towards the close of the reign of Charles the Second, when his father Josias, along with his uncle Benjamin, became dissenters. These men were both bred to the trade of silk-dyeing. Josias married early in life; and about the year 1682 he emigrated, with his wife and three children, to America, on account of the persecutions to which he was exposed for his dissenting principles. On arriving in New England, he embraced the occupations of soap-boiler and tallow-chandler, of which businesses he previously knew nothing, but only from their being at the time the likeliest to provide maintenance for his increasing family. He appears to have been a man of great penetration and solid judgment; prudent, active, and frugal; and although kept in comparative poverty by the expenses of his numerous family, was held in great esteem by his townsmen. In no respect was his practical good sense more conspicuous than in the education of his children; and his illustrious son frequently alludes, in terms of thankfulness and gratitude, to the many exemplary precepts and sound moral lessons he received while under the paternal roof. The following passage may be read with no little instruction by the heads and members of all families similarly circumstanced:—"He was fond of having at his table, as often as possible, some friends, or well-informed neighbours, capable of rational conversation; and he was always careful to introduce useful or ingenious topics of discourse, which might tend to form the minds of his children. By this means he early attracted our attention to what was just, prudent, and beneficial in the conduct of life. He never talked of the meats which appeared on the table; never discussed whether they were well or ill dressed, of a good or bad flavour, high-seasoned or otherwise, preferable or inferior to this or that dish of a similar kind. Thus accustomed from my infancy to the utmost inattention to these objects, I have since been perfectly regardless of what kind of food was before me; and I pay so little attention to it even now, that it would be a hard matter for me to recollect, a few hours after I had dined, of what my dinner had consisted. When travelling, I have particularly experienced the benefit of this habit; for it has often happened to me to be in company with persons, who, having a more delicate because a more exercised taste, have suffered in many cases considerable inconvenience; while, as to myself, I have had nothing to desire." Benjamin was at first designed to be a clergyman, and at eight years of age was put to the grammar-school with that view, having previously been taught to read. His uncle Benjamin, who had likewise emigrated, encouraged this project. This individual appears to have been an equally eccentric and ingenious man. He cultivated the Muses with a success that gave himself, at least, entire satisfaction. But what he was most proud of was a species of short-hand of his own invention, wherewith he had carried off from the conventicles in England several volumes of sermons whole and entire; and these he designed for his nephew's stock in trade, when he should set up as preacher. But young Franklin had not been a year at school when his father perceived that his circumstances were quite inadequate to the expenses necessary to complete his son's education for the clerical profession. He accordingly removed him from the more learned seminary, and placed him under an humbler teacher of reading and writing for another twelvemonth, preparatory to binding him to some handicraft trade.

APPRENTICESHIP.

When his term at school was expired, being then ten years of age, he was taken home to assist his father in his business; but he soon testified such repugnance to the cutting of wicks for candles, running errands, waiting in the shop, with other drudgery of the same nature, that, after a tedious and ill-borne trial of two years, his father became afraid of his running off to sea (for which he confesses to have had a predilection), as an elder brother had done, and resolved to put him to some other occupation. After much deliberation, therefore, he was sent on trial for a few days to his cousin (a son of Benjamin), who was a cutler; but that relative being desirous of a larger apprenticeship-fee than his uncle could spare, he was recalled. His brother James, a short time previous to this period, had returned from England, whither he had been sent to learn the printing business, and set up a press and types on his own account at Boston. To him, therefore, after no little persuasion, Benjamin at last agreed to become apprentice, and he was indentured accordingly for the term of nine years; that is, until he should reach the age of twenty-one.

The choice of this profession, as it turned out, was a lucky one; and it was made after much careful and correct observation on the part of the parent. He had watched his son's increasing fondness for books, and thirst for information, and that, too, of a solid and instructive sort; and he therefore judiciously resolved to place him in a favourable situation for gratifying this propensity in the youthful mind; while he would, at the same time, be instructed in a profession by which he

could always independently maintain himself, in whatever quarter his fortunes might lead him, within the bounds of the civilized world. Franklin thus speaks of his early and insatiable craving after knowledge :—

"From my earliest years I had been passionately fond of reading, and I laid out in books all the money I could procure. I was particularly pleased with accounts of voyages. My first acquisition was Bunyan's collection, in small separate volumes. These I afterwards sold, in order to buy an historical collection by R. Burton, which consisted of small cheap volumes, amounting in all to about forty or fifty. My father's little library was principally made up of books of practical and polemical theology. I read the greatest part of them. There was also among my father's books Plutarch's Lives, in which I read continually, and I still regard as advantageously employed the time devoted to them. I found, besides, a work of De Foe's, entitled An Essay on Projects, from which, perhaps, I derived impressions that have since influenced some of the principal events of my life." It seems to have been lucky for himself and mankind that the last-named author's most celebrated work, Robinson Crusoe, did not fall into his hands at this period.

By his assiduity Franklin soon attained great proficiency in his business, and became very serviceable to his brother. At the same time, he formed acquaintance with various booksellers' apprentices, by whose furtive assistance he was enabled to extend the sphere of his reading. This gratification, however, was for the most part enjoyed at the expense of his natural rest. "How often," says he, "has it happened to me to pass the greater part of the night in reading by my bedside, when the book had been lent me in the evening, and was to be returned the next morning, lest it might be missed or wanted!" His studious habits and intelligent conversation also attracted the notice of a wealthy merchant who was in the habit of coming about the office, who invited him to his house and gave him the use of an excellent library.

It is a singular peculiarity of all minds of an active and aspiring character, that they uniformly endeavour to do whatever others have done, and from which they themselves have derived enjoyment or benefit. Franklin, from the delight he took in the perusal of books, at last bethought him of trying his own hand at composition; and as has happened, we believe, with a great proportion of literary men of all ages, his first efforts were of a poetical nature. His brother, having come to the knowledge of his attempts, encouraged him to proceed, thinking such a talent might prove useful in the establishment. At the suggestion of the latter, therefore, he finished two ballads, which, after being printed, he was sent round the town to sell; and one of them, the subject of which was a recent affecting shipwreck, had, he says, a prodigious run. But his father having heard of the circumstance, soon let down the pegs of the young poet's vanity, by analyzing his verses before him in a most unmerciful style, and demonstrating, as Franklin says, what "wretched stuff they really were." This sharp lesson, which concluded with a warning that versifiers were almost uniformly beggars, effectually weaned him from his rhyming propensities.

Franklin immediately afterwards betook himself to the composition of prose, and the first opportunity of exercising his pen and his faculties in this way occurred in the following manner:—He had a young acquaintance of the name of Collins, who was like himself passionately fond of books, and with whom he had frequent and long arguments on various subjects. In narrating this circumstance, Franklin comments, in passing, on the dangerous consequences of acquiring a disputatious habit, as tending to generate acrimony and discord in society, and often hatred between the best of friends. He dismisses the subject with the following singular enough observation:—"I have since remarked, that men of sense seldom fall into this error—lawyers, fellows of universities, and *persons of every profession educated at Edinburgh*, excepted!" But to proceed: Franklin and his companion having as usual got into an argument one day, which was maintained on both sides with equal pertinacity, they parted without bringing it to a termination: and as they were to be separated for some time, an agreement was made that they should carry on their dispute by letter. This was accordingly done; when, after the interchange of several epistles, the whole correspondence happened to fall into the hands of Franklin's father. After perusing it with much interest, his natural acuteness and good sense enabled him to point out to his son how inferior he was to his adversary in elegance of expression, arrangement, and perspicuity. Feeling the justice of his parent's remarks, he forthwith studied most anxiously to improve his style; and the plan he adopted for this purpose is equally interesting and instructive.

"Amidst these resolves," he says, "an odd volume of the Spectator fell into my hands. This was a publication I had never seen. I bought the volume, and read it again and again. I was enchanted with it, thought the style excellent, and wished it were in my power to imitate it. With this view I selected some of the papers, made short summaries of the sense of each period, and put them for a few days aside. I then, without looking at the book, endeavoured to restore the essays to their due form, and to express each thought at length, as it was in the original, employing the most appropriate words that occurred to my mind. I afterwards compared *my* Spectator with the original. I perceived some faults, which I corrected; but I found that I chiefly wanted a fund of words, if I may so express myself, and a facility of recollecting and employing them, which I thought I should by that time have acquired, had I continued to make verses. The continual need of words of the same meaning, but of different lengths, for the measure, and of different sounds for the rhyme, would have obliged me to seek for a variety of synonyms, and have rendered me master of them. From this belief, I took some of the tales of the Spectator, and turned them into verse; and after a time, when I had sufficiently forgotten them, I again converted them into prose. Sometimes, also, I mingled my summaries together; and, a few weeks afterwards, endeavoured to arrange them in the best order, before I attempted to form the periods and complete the essays. This I did with a view of acquiring method in the arrangement of my thoughts. On comparing afterwards my performance with the original, many faults were apparent, which I corrected; but I had sometimes the satisfaction to think, that, in certain particulars of little importance, I had been fortunate enough to improve the order of the thought or style; and this encouraged me to hope that I should succeed in time in writing decently in the English language, which was one of the greatest objects of my ambition."

But it was not only by such rigorous self-imposed tasks that this extraordinary man, even at so early an age, endeavoured to chasten his mind, and make every animal propensity subservient to his sense of duty. He also began to exercise those acts of personal self-denial which the heyday of youth, the season for animal enjoyment, feels as the most intolerable of all restrictions. Having met with a work recommending a vegetable diet, he determined to adopt it. Finding, after some days' trial, that he was ridiculed by his fellow-boarders for his singularity, he proposed to his brother to take the half of what was now paid by that relative for his board, and therewith to maintain himself. No objection was, of course, made to such an arrangement; and he soon found that of what he received he was able to save one-half. "This," says he, "was a no fund for the purchase of

books, and other advantages resulted to me from the plan. When my brother and his workmen left the printing-house to go to dinner, I remained behind; and despatching my frugal meal, which frequently consisted of a biscuit only, or a slice of bread and a bunch of raisins, or a bun from the pastry-cook's, with a glass of water, I had the rest of the time till their return for study; and my progress therein was proportioned to that clearness of ideas and quickness of conception which are the fruits of temperance in eating and drinking."

Another remarkable instance of the resolute way in which he set about making himself master of whatever acquirement he found more immediately necessary to him at the moment, is the following:—Having been put to the blush one day for his ignorance in the art of calculation, which he had twice failed to learn while at school, he procured a copy of Cocker's Arithmetic, and went through it all, making himself completely master of it before turning his mind to any thing else! He soon after, also, gained some little acquaintance with geometry, by perusing a work on navigation. He mentions, likewise, his reading about this time Locke's Essay on the Understanding, and the Art of Thinking, by Messrs. du Port Royal. Having found, in some essay on rhetoric and logic, a model of disputation after the manner of Socrates, which consists in drawing on your opponent, by insidious questions, into making admissions which militate against himself, he became excessively fond of it, he says, and practised it for some years with great success, but ultimately abandoned it, perceiving that it could be made as available to the cause of wrong as that of right, while the prime end of all argument was to convince or inform.

About three years after Franklin went to his apprenticeship, that is to say, in 1721, his brother began to print a newspaper, the second that was established in America, which he called the New England Courant: the one previously established was the Boston News Letter. The new publication brought the most of the *literati* of Boston about the printing-office, many of whom were contributors; and Franklin frequently heard them conversing about the various articles that appeared in its columns, and the approbation with which particular ones were received. He became ambitious to participate in this sort of fame; and having written out a paper, in a disguised hand, he slipped it under the door of the printing-office, where it was found next morning, and submitted, as usual, to the critics when they assembled. "They read it," he says; "commented on it in my hearing; and I had the exquisite pleasure to find that it met with their approbation; and that in the various conjectures they made respecting the author, no one was mentioned who did not enjoy a high reputation in the country for talent and genius. I now supposed myself fortunate in my judges, and began to suspect that they were not such excellent writers as I had hitherto supposed them. Be this as it may, encouraged by this little adventure, I wrote and sent to press, in the same way, many other pieces which were equally approved—keeping the secret till my slender stock of information and knowledge for such performances was pretty completely exhausted." He then discovered himself, and had the satisfaction of finding he was treated with much more respect by his brother and his friends than heretofore.

The two brothers, however, lived together on very disagreeable terms, in consequence of the hasty and overbearing temper of the elder; and Benjamin anxiously longed for an opportunity of separating from him. This at last occurred. His brother was apprehended and imprisoned for some political article which offended the local government, and upon his liberation was prohibited from ever printing his newspaper again. It was therefore determined that it should be published in Benjamin's name, who had managed it during his brother's confinement with great spirit and ability. To avoid having it said that the elder brother was only screening himself behind one of his apprentices, Benjamin's indenture was delivered up to him discharged, and private indentures entered into for the remainder of his time. This underhand arrangement was proceeded in for several months, the paper continuing to be printed in Benjamin's name; but his brother having one day again broken out into one of his violent fits of passion, and struck him, he availed himself of his discharged indentures, well knowing that the others would never be produced a[gainst] him, and gave up his employment. Franklin afterwards regretted his having taken so unfair an advantage of his brother's situation, and regarded it as one of the first *errata* of his life. His brother felt so exasperated on the occasion, that he went round all the printing-offices, and represented Benjamin in such a light that they all refused his services.

PROCEEDS TO PHILADELPHIA.

Finding he could get no employment in Boston, as well as that he was regarded with dislike by the government, he resolved to proceed to New York, the nearest town in which there was a printing-office. To raise sufficient funds for this purpose, he sold part of his library; and having eluded the vigilance of his parents, who were opposed to his intention, he secretly got on board of a vessel, and landed at New York on the third day after sailing.

Thus, at the age of seventeen, Franklin found himself three hundred miles from his native place, from which he was in some sort a runaway, without a friend, or recommendation to any one, and with very little money in his pocket. To complete his dilemma, he found, on applying, that the only printer then in the town could give him no employment. That person, however, recommended him to go to Philadelphia, where he had a son, who, he thought, would give him work; and he accordingly set off for that place. His journey was a most disastrous one both by water and land, and he frequently regretted leaving home so rashly. He reached his destination at last, however, and in a plight which certainly did not bode over-auspiciously for his future fortunes. His own graphic description of his condition and appearance, on his first entrance into Philadelphia, is at once interesting and amusing:—

"I have entered into the particulars of my voyage, and shall in like manner describe my first entrance into this place, that you may be able to compare beginnings so unlikely with the figure I have since made. I was in my working dress, my best clothes being to come by sea. I was covered with dirt; my pockets were filled with shirts and stockings; I was unacquainted with a single soul in the place, and knew not where to seek a lodging. Fatigued with walking, rowing, and having passed the night without sleep, I was extremely hungry, and all my money consisted of a Dutch dollar, and about a shilling's worth of coppers, which I gave to the boatmen for my passage. At first they refused it because I had rowed, but I insisted on them taking it. A man is sometimes more generous when he has little than when he has much money, probably because he is, in the first place desirous of concealing his poverty.

"I walked towards the top of the street, looking eagerly on both sides, till I came to Market street, where I met a child with a loaf of bread. I inquired where he had bought it, and went straight to the baker's shop which he pointed out to me. I asked for some biscuits, expecting to find such as we had at Boston; but they made, it seems, none of that sort at Philadelphia. I then asked for a threepenny loaf; they made no loaves of that price. I then desired him to let me have threepence worth of bread, of some kind or other. He gave me three large rolls. I was surprised at receiving so much. I took

them, however, and having no room in my pockets, I walked on, with a roll under each arm, eating the third. In this manner I went through Market street to Fourth street, and passed the house of Mr. Read, the father of my future wife. She was standing at the door, observed me, and thought with reason that I made a very singular and grotesque appearance. I then turned the corner, and went through Chestnut street, eating my roll all the way; and, having made this round, I found myself again on Market street wharf, near the boat on which I arrived. I stepped into it to take a draft of the river water; and finding myself satisfied with my first roll, I gave the other two to a woman and her child who had come down the river with us in the boat, and was waiting to continue her journey. Thus refreshed, I regained the street, which was now full of well-dressed people all going the same way. I joined them, and was thus led to a Quakers' meeting-house, near the market-place. I sat down with the rest, and, after looking round me for some time, hearing nothing said, and being drowsy from my last night's labour and want of rest, I fell into a sound sleep. In this state I continued till the assembly dispersed, when one of the congregation had the goodness to wake me. This was consequently the first house I entered, or in which I slept, in Philadelphia."

Having with some difficulty procured a lodging for the night, he next morning waited on Mr. Bradford, the printer to whom he had been directed. That individual said he had no work for him at present, but directed him to a brother in trade of the name of Keimer, who, upon application, made him the same answer; but, after considering a little, set him to put an old press to rights, being the only one indeed he possessed; and in a few days gave him regular work. Upon this, Franklin took a lodging in the house of Mr. Read, his future father-in-law.

Franklin had been some months at Philadelphia, without either writing to or hearing from home, and, as he says, trying to forget Boston as much as possible, when a brother-in-law of his, a master of a vessel, having accidentally heard where he was, wrote to him, pressing his return home in the most urgent terms. Franklin's reply, declining compliance with the request, happened to reach his brother-in-law when the latter was in the company of Sir William Keith, governor of the province; and the composition and penmanship struck him as so much superior to the ordinary style of letter-writing, that he showed it to his excellency. The governor was no less pleased with it, and expressed the utmost surprise when told the age of the writer. He observed, that he must be a young man of promising talents, and said that if he would set up business on his own account at Philadelphia, he would procure him the printing of all the public papers, and do him every other service in his power. Franklin heard nothing of this from his brother-in-law at the time; but one day while he and Keimer were at work in the office, they observed through the window the governor and another gentleman (who proved to be Colonel French of Newcastle, in the province of Delaware), finely dressed, cross the street, and come directly for the office, where they knocked at the door. Keimer ran down, in high expectation of this being a visit to himself; "but the governor (says Franklin) inquired for me, came up stairs, and with a politeness to which I had not at all been accustomed, paid me many compliments, desired to be acquainted with me, obligingly reproached me for not having made myself known to him on my arrival in town, and wished me to accompany him to a tavern, where he and Colonel French were going to taste some excellent Madeira wine! I was, I confess, somewhat surprised, and Keimer was thunderstruck. I went, however, with the governor and Colonel French to a tavern at the corner of Third street, where, while we were drinking the Madeira, he proposed to me to establish a printing-house. He set forth the probabilities of success, and himself and Colonel French assured me that I should have their protection and influence in obtaining the printing of the public papers for both governments; and as I appeared to doubt whether my father would assist me in this enterprise, Sir William said that he would give me a letter to him, in which he would recommend the advantages of the scheme in a light which he had no doubt would determine him to agree to do so. It was thus concluded that I should return to Boston by the first vessel, with the letter of recommendation from the governor to my father. Meanwhile, the project was to be kept secret, and I continued to work to Keimer as before. The governor subsequently sent for me every now and then to dine with him. I considered this a very great honour; and I was the more sensible of it, as he conversed with me in the most affable, friendly, and familiar manner imaginable."

In pursuance of the above arrangement, Franklin set out on his return homewards, in the end of April, 1724, having been absent about seven months, during which time his parents and relations had heard nothing of him whatever, his brother-in-law never having written to inform them where he was. All the family, with the exception of his brother James, were delighted to see him; and not the less so, perhaps that he was apparelled in a complete new suit of clothes, had an excellent silver watch, and about five pounds sterling in his pocket. His father was exceedingly surprised when informed of the object of his visit, and still more at the contents of Governor Keith's epistle. After long deliberation, he came to the resolution of refusing compliance with the request, on account of his son being too young to undertake the management of such a speculation; adding, that he thought the governor a man of little discretion in proposing it. He promised, however, when his son had attained his twenty-first year, that he would supply him with what money he required to set him up in business, praising him highly, at the same time, for his industry and good conduct. Franklin, accordingly, was necessitated to return to Philadelphia with the news of his bad success, but left Boston, on this occasion, accompanied by the blessings of his parents. When he arrived at Philadelphia, he immediately waited upon the governor, and communicated the result of his journey. Sir William observed that his father was "too prudent;" but added, "since he will not do it, I will do it myself." It was ultimately arranged, therefore, that Franklin should proceed personally to London, to purchase every thing necessary for the proposed establishment, for the expense of which the governor promised him a letter of credit to the extent of £100, with recommendations to various people of influence.

SAILS FOR ENGLAND.

It had been arranged that Franklin was to go to England in the regular packet-ship; and as the time of her sailing drew near, he became importunate for the governor's letters of credit and recommendation, but the latter always put him off under various pretences. At last, when the vessel was on the point of departing, he was sent on board, under the assurance that Colonel French would bring the letters to him immediately. That gentleman accordingly came on board with a packet of despatches tied together, which were put into the captain's bag, and Franklin was informed that those intended for him were tied up with the rest, and would be delivered to him before landing in England. When they arrived in the Thames, accordingly, the captain allowed him to search the bag, but Franklin could find no letters directed either to himself or addressed as to his care; but he selected six or seven, which, from the directions on them, he conceived to be those intended for his service. One of these was to the king's printer, and Franklin accordingly waited upon that gentleman with it; but the latter had no sooner

opened it, than he exclaimed, "Oh, this is from Riddleden!—(a well-known rascally attorney at Philadelphia); I have lately discovered him to be an arrant knave, and wish to have nothing to do either with him or his letters." So saying, he turned on his heel, and resumed his occupation. In short, it turned out that none of the letters were from the governor; and he soon learned from a gentleman of the name of Denham, who had been a fellow-passenger with him, and to whom he explained his awkward situation, that the governor was a complete cheat, deceiving people, from vanity and a love of self-consequence, with promises which he neither intended nor was able to fulfil; and laughed at the idea of a man giving a letter of credit for £100 who had no credit for himself.

Franklin's situation was now even more desolate than when set ashore, ragged, hungry, and almost penniless, at Philadelphia, little more than a twelvemonth before. But the heart at eighteen is not naturally inclined to despond, and never was one less so than Franklin's. He immediately applied for and obtained employment in the office of the celebrated Mr. Palmer. Among other works on which he was set to work here, was a second edition of Wollaston's Religion of Nature. Conceiving some of the positions assumed in it to be weak or erroneous, he composed and published a small metaphysical treatise in refutation of them. This pamphlet acquired him considerable credit with his master as a man of talent; but that gentleman reprobated, with the utmost abhorrence, the doctrines maintained in his publication, which, truth compels us to say, were completely irreligious, so far as regarded the Christian faith, or any other acknowledged system of belief. Free-thinking, however, was then in fashion among the higher and more learned classes, and his pamphlet procured him the countenance of various eminent individuals; among the rest, of Dr. Mandeville, author of the Fable of the Bees, and Dr. Pemberton, Sir Isaac Newton's friend. He was likewise waited upon by Sir Hans Sloane, who had been informed of his bringing some curiosities with him from America; among others, a purse of asbestos—a natural substance which resists the action of fire, and then very little known—for which he paid Franklin a high price. From Mr. Palmer's office he removed to Mr. Watt's, for the consideration of a higher wage. Here he gave a striking proof of that resolute adherence to temperance, industry, and frugality, which were among the leading features of his character. While Mr. Watt's other workmen spent generally five or six shillings a week on beer, which was brought into the office to them during the day, he drank nothing but water; and they were surprised to see that he was much stronger than any of them, while he himself had the additional comfort and satisfaction of being always clear-headed. At first they ridiculed his abstinence, and conferred upon him the soubriquet of the *American Aquatic;* but as his character rose among them, his example, he says, "prevailed with several of them to renounce their abominable breakfast of bread and cheese, with beer; and they procured, like me, from a neighbouring house, a good basin of warm gruel, in which was a small slice of butter, with toasted bread and nutmeg. This was a much better breakfast, which did not cost more than a pint of beer, namely, three halfpence, and at the same time preserved the head clearer." His assiduous application to business, at the same time, together with remarkable quickness in *composing* (setting up the types), recommended him to his employer, and procured him all the most urgent and best-paid work: so that, with his frugal mode of living, he quickly laid past money.

RETURNS TO AMERICA.

After having been about eighteen months in London, much to his advantage in every respect—for, besides becoming more proficient in his business, he had stuck to his books as sedulously as ever, even though he frequently went to the play, made little pleasure excursions, and mingled a good deal in society—he was about to set out on a tour through Europe, with a young intelligent fellow-workman (designing to maintain themselves during their pilgrimage by means of their calling), when he accidentally met with Mr. Denham, before noticed as being his fellow-passenger from America. That gentleman was on the eve of returning to Philadelphia, to open a merchant's store, and offered Franklin the situation of his clerk, with a salary of £50 per annum. This sum was less than he was making as a compositor; but an anxious desire to revisit his native country induced him to accept of it. They set sail accordingly—Franklin now supposing that he had relinquished the composing-stick for ever—and arrived at Philadelphia on the 11th of October, 1726. Franklin had just entered his twenty-first year at this time; and he mentions having drawn up for himself in writing, during the voyage, a plan for the regulation of his future conduct. This interesting document was afterwards unfortunately lost; but he tells us himself that he pretty faithfully adhered to the rules thus early laid down, even into old age. Upon his arrival, he found that his old acquaintance, the governor, had been supplanted in his office, and was held in general contempt. They met several times, but no allusion was ever made by Franklin to the disgraceful imposture the other had practised on him.

Franklin's new employer had only been in business for a few months, when both were seized at the same time with a violent disorder, which carried off the master in a few days, and brought the clerk to the brink of the grave. On his recovery, being thus once more left destitute, he was fain to accept employment as a printer from his old master Keimer, who was now somewhat better off in the world, but still utterly ignorant of his profession. The whole charge of the office, with that of instructing four or five ignorant apprentices, devolved on Franklin. "I also," says he, "upon occasion, engraved various ornaments, made ink, gave an eye to the shop—in short, I was, in every respect, the *factotum*." But he likewise, at this time, gave another remarkable instance of his versatile ingenuity.

"Our press," says he, "was frequently in want of the necessary quantity of letter, and there was no such trade as that of letter-founder in America. I had seen the practice of this art at the house of James, in London, but had at the time paid it very little attention. I, however, contrived to fabricate a mould. I made use of such letters as we had for punches, founded new letters of lead in matrices of clay; and thus supplied, in a tolerable manner, the wants that were most pressing." Franklin's inventive mind would seem here to have obtained a distant glimpse of the principle of *stereotyping*, which has since been carried to such a height of usefulness and perfection, as exemplified in the various publications of the editors of this miscellany.

Keimer having engaged Franklin solely with the view of having his apprentices so far initiated in the art as that he could dispense with their instructor's services, took the first occasion to quarrel with him when he thought he had sufficiently attained his object. Upon their separation, one of Keimer's apprentices, named Meredith, who, like all the others, had conceived a great veneration for Franklin, proposed that they should enter into partnership together—Meredith's friends undertaking to furnish the capital necessary for purchasing the materials, &c. This offer was too advantageous to be refused, and types, press, &c., were forthwith commissioned from London; but while preparing to put their plan into execution, Franklin was induced, during the interval, to return again to Keimer, at the urgent solicitation of the latter. The motive for this humble entreaty

was that individual's having taken a contract for the printing of some paper-money for the state of New Jersey, requiring a variety of new cuts and types, which he knew well nobody in that place but Franklin could supply. This also presents us with a very striking instance of Franklin's remarkable gift of invention.

"To execute the order," says he, "I constructed a copperplate printing-press—the first that had been seen in the country. I engraved various ornaments and vignettes for the bills, and we repaired to Burlington together, where I executed the whole to the general satisfaction, and he (Keimer) received a sum of money for this work which enabled him to keep his head above water for a considerable time longer."

At Burlington, Franklin formed acquaintance with all the principal personages of the province, who were attracted by his superior abilities and intelligence. Among these was the inspector-general, Isaac Decon, "who," says Franklin, "was a shrewd and subtle old man. He told me that his first employment had been that of carrying clay to the brickmakers; that he did not learn to write till he was somewhat advanced in life; that he was afterwards employed as underling to a surveyor, who taught him his trade; and that, by industry, he had at last acquired a competent fortune. 'I foresee,' said he, 'that you will soon supplant this man (speaking of Keimer), and get a fortune in the business at Philadelphia.' He was wholly ignorant at the time of my intention of establishing myself there, or anywhere else."

ENTERS INTO BUSINESS.

Franklin had scarcely returned from Burlington, when the types commissioned for himself and Meredith, from London, arrived; and having settled matters with Keimer, the partners immediately took a house, and commenced business. They were in the act of opening up their packages, when a countryman came in to have a job done; and as all their cash had been expended in their various purchases, "this countryman's five shillings," says Franklin, "being our first fruits, and coming so seasonably, gave me more pleasure than any crown I have since earned." A number of young men having, during the preceding year, formed themselves, at Franklin's suggestion, into a weekly club for the purpose of mutual improvement, they were so well pleased with the beneficial results they experienced from their meetings, that, when the originator of their society set up in business, every one exerted himself more than another to procure him employment. One of them obtained from the Quakers the printing of forty sheets of a history of that sect, then preparing at the expense of the body. "Upon these," says Franklin, "we worked exceeding hard, for the price was very low. It was in folio, upon *pro patria* paper, and in the *pica* letter, with heavy notes in the smallest type. I composed a sheet a day, and Meredith put it to press. It was frequently eleven o'clock at night, sometimes later, before I had finished my distribution for the next day's task; for the other little jobs that came in kept us back in this work; but I was so determined to compose a sheet a day, that one evening, when my form was imposed, and my day's work, as I thought, at an end, an accident broke the form, and deranged two complete folio pages. I immediately distributed and composed them anew before I went to bed." This unwearied industry, which soon became known, acquired Franklin great reputation and credit among his townsmen, and business began rapidly to flow in upon them.

STARTS A NEWSPAPER.

The establishment and management of a newspaper seems to have all along been a favourite project with Franklin; probably because, from his former experience in it, and the consciousness of his powers of writing, he felt himself so well adapted for the task. The partners soon found themselves in circumstances to enable them to make the trial; but Franklin having incautiously divulged their intention to a third person, that individual informed their old master Keimer of the fact, who immediately took steps to anticipate them, and issued a prospectus of a paper of his own. The manner in which Franklin met and defeated this treachery is exceedingly characteristic. There was another paper published in Philadelphia by Mr. Bradford, which had been in existence for some years, but was such a miserable affair, that it only preserved its vitality because no other arose to knock it on the head. In order to keep down Keimer's publication, however, Franklin saw the policy of supporting the old one until prepared to start his own. He thereupon set about writing a series of amusing articles for it, which the publisher, Bradford, was of course very glad to insert. "By this means," says Franklin, "the attention of the public was kept fixed on that paper, and Keimer's proposals, which we burlesqued and ridiculed, were disregarded. He began his paper, however; and, after continuing it for nine months, having at most not more than ninety subscribers, he offered it to me for a mere trifle. I had for some time been prepared for it; I therefore instantly took it upon myself, and in a few years it proved very profitable to me." In fact, it obtained notoriety and applause at the very first number, in consequence of some observations therein by Franklin, on an important colonial question; and various members of Assembly exerted themselves so well in his behalf, that the printing of the House was speedily transferred from Bradford to his two young rivals. In the management of his newspaper, Franklin pursued a system of unflinching integrity. He steadfastly refused to give admission into his columns of any article containing personal abuse of particular individuals. Whenever he was requested to publish any thing of this sort, his answer was, that he would print the piece by itself, and give the author as many copies for his own distribution as he wished. He very wisely considered that his subscribers expected him to furnish them with useful and entertaining information, and not with personal slander or private discussions with which they had no concern.

COMMENCES BUSINESS BY HIMSELF.

Luckily for Franklin, almost at the commencement of the newspaper, an opportunity occurred of getting rid of his partner Meredith, who had become an idle, drunken fellow, and had all along been of comparatively little use in the concern. Meredith's father failed to implement the bargain for advancing the necessary capital to pay the demands of the paper-merchant, and other expenses necessarily attending their speculation, when they became due. A suit was accordingly instituted against the partners; and as Meredith's father declared his inability to pay the amount of the claims upon them, the son offered to relinquish the whole concern into Franklin's hands, on condition that the latter would take upon him the debts of the company, repay his father what he had already advanced, settle his own little personal debts, and give him thirty pounds and a new saddle! By the kindness of two friends, who, unknown to each other, came forward simultaneously and unasked to his assistance, Franklin was enabled to accept the offer. The agreement was carried into effect, and thus do we find this extraordinary man, at the age of twenty-four, and in the place where he had arrived penniless only seven years before, settled down in business, with a thriving trade proprietor of an extensively circulated newspaper, and a firmly established reputation of no ordinary kind. As this success, however, the result of his own good conduct, perseverance, and frugality, had no undue effect on his well-regulated mind, or could induce him to assume those airs of arrogant superiority and pretension, which

serve but too frequently blemished the character of those who have praiseworthily achieved their own elevation in society. On the contrary, he dressed more plainly, and deported himself more humbly, than ever; and to show that he was not above his business, he sometimes wheeled home on a barrow, with his own hands, the paper which he purchased at the stores.

Soon after getting the whole printing and newspaper concern into his hands, there was an outcry among the people for a new emission of paper-money. Franklin took up the cause, and by his arguments in a pamphlet which he published on the subject, contributed so greatly to the success of the proposal, and obtained himself so much popularity, that upon its being resolved to issue the notes, Franklin was selected to print them. He then opened a stationer's shop, and from his success in business, began gradually to pay off his debts. Meanwhile, his old master Keimer went fast to ruin, and with the exception of old Mr. Bradford, who was rich and did not care for business, he was the only printer in the place. He shortly afterwards married Miss Read, the lady named in a former part of this memoir. Franklin's behaviour to this young lady had not been altogether blameless. Previous to his sailing for England, he had exchanged pledges of affection with her; yet, all the while he was away, he only sent her one letter. Her friends and herself concluding that he either never meant to return, or that he wished to drop connection with her, she was induced to accept the hand of another suitor, and on his return to America Franklin found her married—an event that seems to have given him extremely little uneasiness. The lady's husband proved a great rogue, deserted her, and it was subsequently ascertained that he had still a former wife living. After being established in business, and rising in the world, the intimacy between Franklin and her family was renewed, and it was not long ere, despite her dubious situation, they hazarded a fulfilment of their early vows. The lady was about Franklin's own age, and proved, according to his own testimony, "an honour and a blessing to him."

In 1731, Franklin drew up proposals for a public subscription library at Philadelphia, being the first project of the sort that had been started in America. Fifty persons at first subscribed forty shillings each, and agreed to pay ten shillings annually; and the establishment was put under such judicious rules of management, that in the course of ten years it became so valuable and important as to induce the proprietors to get themselves incorporated by royal charter. This library afforded its founder facilities of improvement of which he did not fail to avail himself, setting apart, as he tells us, an hour or two every day for study, which was the only amusement he allowed himself. Several other companies were formed in the city in imitation of it, and the whole were finally united in one institution. A taste for reading was thus spread around, and libraries were formed throughout Pennsylvania.

Franklin was much gratified by the success of his scheme, and continued by his example to encourage habits of industry in the young, and to raise a taste for literary and other rational recreations. We now find him, at the early age of twenty-five or twenty-six, fairly embarked in life as a tradesman, citizen, and a lover of literary and scientific pursuits. His first consideration was scrupulous attention to business and to his family. He took care, he says, not only to be *really* industrious and frugal, but also to avoid every appearance to the contrary—was plainly dressed, and was never seen in any place of amusement: never went a-fishing or hunting; his only relaxation being in a game of chess, of which he was very fond. He devoted the greater part of his leisure time to self-examination and improvement. On instituting a rigorous examination into his conduct and character, he found that he possessed many faults, which he resolved upon amending, he even conceived the bold idea of seeking to attain *moral perfection*. With the view of carrying this project into execution, he fell upon the device of methodizing his time during the twenty-four hours of every day, and of laying down certain rules by which he should regulate his conduct and sentiments. He rose at 5 in the morning; the next three hours he appropriated to devotional exercise, study, cleaning of the person, and breakfast. From 8 till 12 he was at work. From 12 till 2 he read, did any desultory duties, and dined. From 2 till 5 he was again at work. From 6 till 10, he devoted to reading, conversation, intercourse with his family, and supper; and from 10 till 4 or 5 in the morning, to sleep; after which he arose and pursued the same routine as before. We thus see that early rising was a leading feature in his habits of life, and to this alone he doubtless owed much of his success.

Franklin's arrangement of his time was less remarkable than his plan of self-examination. We have said that he established certain rules for the regulation of his conduct. These were thirteen in number, and were called by him virtues or precepts to be kept in remembrance: they are thus summed up:—Temperance; silence, or abstaining from frivolous talking; order; resolution, or determination to perform promises and duties; frugality; industry; sincerity, or avoiding of all deceit; justice, or the wronging of no one; moderation; cleanliness; tranquillity of mind; chastity; and humility, in which was included an endeavour to imitate Christ, and also Socrates. It is mentioned by Franklin, that it required a constant care to avoid infringing upon these precepts, and that at length, to assist himself, he prepared a book to serve as a journal of his conduct and thoughts, in which he took pains to mark every error he committed. By this means he was able to observe how he advanced in virtue, and how far he abstained from error: it was his anxious wish to see the tables in his book free from any markings or indications of imperfection of character. To this journal of his conduct he attached certain mottoes; one of which was a verse from the Proverbs of Solomon, in which wisdom is eulogized:—"Length of days is in her right hand, and in her left riches and honour. Her ways are ways of pleasantness, and all her paths are peace." Another of his mottoes was in the form of a pious aspiration or prayer, in which he implored the divine blessing on his labours, and an increase of that wisdom which was most beneficial to him. One of his favourite passages which he occasionally repeated, was the beautiful address to the Deity in Thomson's poem on the Seasons:

> "Father of light and life, thou God supreme!
> Oh teach me what is good; teach me thyself!
> Save me from folly, vanity and vice,
> From every low pursuit; fill my soul
> With knowledge, conscious peace, and virtue pure,
> Sacred, substantial, never-fading bliss!"

He tells us that the most troublesome part of his prescribed task of self-regulation, was the obligation to preserve order in his line of duties—being most likely liable to distraction by trifling circumstances constantly interfering to mar his project. Nevertheless, he persevered, forced himself to be methodic, and was thus able to proceed with studies tending greatly to his mental improvement, and his increase in useful knowledge.

Of Franklin's intercourse with his family little has been made known, though it is ascertained, by a few scattered hints in his writings, that he was an affectionate husband and father, and placed much of his happiness in home. In his household affairs the most exact economy prevailed, and, for several years after his marriage, his breakfast consisted simply of bread and milk, which he ate from a twopenny earthenware porringer with a pewter spoon. Fortunately, his wife was as much disposed

to be industrious as he was; she assisted him in his business, folded the sheets of books which he printed, kept his shop, and executed other humble but useful duties. By following this industrious and economical plan of living, they gradually accumulated wealth, and were enabled to possess comforts and luxuries which were at first beyond their reach. Still, Franklin was not puffed up by prosperity, but continued to live in a style of simplicity agreeable to the notions he had formed at the outset of his career.

In conducting his business, he happily united the occupation of a printer with the profession of an author, and thus became the publisher of his own literary productions. No large work, however, was given by him to the world. His writings were chiefly of a minor character, such as detached pamphlets on subjects of local import, and short essays; and he did not, as it appears, write much that has been thought worthy of republication in a succeeding age. His newspaper was the Pennsylvania Gazette, which had been started by Keimor in 1728, and which, after about a twelvemonth's mismanagement, had come into the possession of Franklin and Hugh Meredith. By Franklin's ingenuity, the paper rose in general estimation.

Besides editing his newspaper, he conducted and published an almanac, which he began in 1732, and continued for a period of twenty-five years. This almanac bore the feigned name, Richard Saunders, and hence acquired the title of Poor Richard's Almanac, by which it became extensively known. The leading feature of the work consisted in an array of concise maxims and apothegms of an economical character, distributed here and there throughout the calendar, wherever space was left between the names of the holidays. When Poor Richard's Almanac was brought to a close, a considerable number of the maxims were collected in An address to the Reader, in the last number, and entitled The Way to Wealth. This admirable digest has been since translated into various languages, and is now widely known. We here subjoin a copy:—

THE WAY TO WEALTH.

I stopped my horse lately where a great number of people were collected at an auction of merchants' goods. The hour of sale not being come, they were conversing on the badness of the times; and one of the company called to a plain, clean old man, with white locks, "Pray, Father Abraham, what think ye of the times? Won't these heavy taxes quite ruin the country? How shall we ever be able to pay them? What would you advise us to?" Father Abraham stood up and replied, "If you have my advice, I'll give it to you in short: 'for a word to the wise is enough: and many words won't fill a bushel,' as poor Richard says." They joined in desiring him to speak his mind; and gathering round him he proceeded as follows:—

"Friends (says he) and neighbours, the taxes are indeed very heavy; and if those laid on by the government were the only ones we had to pay, we might more easily discharge them: but we have many others, and much more grievous to some of us. We are taxed twice as much by our idleness, three times as much by our pride, and four times as much by our folly; and from these taxes the commissioners cannot ease or deliver us, by allowing an abatement. However, let us hearken to good advice, and something may be done for us: 'God helps them that help themselves,' as poor Richard says in his Almanac.

"It would be thought a hard government that should tax its people one-tenth part of their time, to be employed in its service; but idleness taxes many of us much more, if we reckon all that is spent in absolute sloth, or doing of nothing, with that which is spent in idle employments, or amusements that amount to nothing. Sloth, by bringing on diseases, absolutely shortens life. 'Sloth, like rust, consumes faster than labour wears; while the key often used is always bright,' as poor Richard says. 'But dost thou love life? then do not squander time, for that's the stuff life is made of,' as poor Richard says. How much more than is necessary do we spend in sleep, forgetting that 'the sleeping fox catches no poultry, and that there will be sleeping enough in the grave,' as poor Richard says. 'If time be of all things the most precious, wasting time must be (as poor Richard says) the greatest prodigality;' since, as he elsewhere tells us, 'Lost time is never found again; and what we call time enough, always proves little enough.' Let us then up and be doing, and doing to the purpose; so by diligence shall we do more with less perplexity. 'Sloth makes all things difficult, but industry all easy,' as poor Richard says; and 'He that riseth late must trot all day, and shall scarce overtake his business at night; while laziness travels so slowly, that poverty soon overtakes him,' as we read in poor Richard; who adds, 'Drive thy business, let not that drive thee;' and,

> 'Early to bed, and early to rise,
> Makes a man healthy, wealthy, and wise.'

"So what signifies wishing and hoping for better times? We make these times better if we bestir ourselves. 'Industry needs not wish,' as poor Richard says; 'He that lives upon hope will die fasting.' 'There are no gains without pains; then help, hands, for I have no lands: or if I have, they are smartly taxed:' and (as poor Richard likewise observes) 'He that hath a trade hath an estate, and he that hath a calling hath an office of profit and honour;' but then the trade must be worked at, and the calling well followed, or neither the estate nor the office will enable us to pay our taxes. If we are industrious, we shall never starve; for as poor Richard says, 'At the working-man's house hunger looks in, but dares not enter.' Nor will the bailiff or the constable enter; for 'Industry pays debts, but despair increaseth them,' says poor Richard. What though you have found no treasure, nor has any rich relation left you a legacy? 'Diligence is the mother of good luck,' as poor Richard says: and 'God gives all things to industry: then plough deep while sluggards sleep, and you will have corn to sell and to keep,' says poor Dick. Work while it is called to-day; for you know not how much you may be hindered to-morrow; which makes poor Richard say, 'One to-day is worth two to-morrows; and, further, 'Have you somewhat to do to-morrow, do it to-day.' 'If you were a servant, would you not be ashamed that a good master should catch you idle? Are you, then, your own master? be ashamed to catch yourself idle,' as poor Dick says. When there is so much to be done for yourself, your family, and your gracious king, be up by peep of day: 'Let not the sun look down, and say, Inglorious here he lies!' Handle your tools without mittens; remember that 'The cat in gloves catches no mice,' as poor Richard says. It is true, there is much to be done, and perhaps you are weak-handed; but stick to it steadily, and you will see great effects: for continual dropping wears away stones, and by diligence and patience the mouse ate into the cable; and 'light strokes fell great oaks,' as poor Richard says in his Almanac, the year I cannot just now remember.

"Methinks I hear some of you say, 'Must a man afford himself no leisure?'—I will tell thee, my friend, what poor Richard says. 'Employ thy time well, if thou meanest to gain leisure; and since thou art not sure of a minute, throw not away an hour.' Leisure is time for doing something useful; this leisure the diligent man will obtain, but the lazy man never; so that, as poor Richard says, 'A life of leisure and a life of laziness are two things.' Do you imagine that sloth will afford you more comfort than labour? No; for, as poor Rich-

ard says, 'Troubles spring from idleness, and grievous toils from needless ease: many without labour would live by their own wits only; but they break for want of stock.' Whereas industry gives comfort, and plenty, and respect. 'Fly pleasures, and they'll follow you; the diligent spinner has a large shift; and now I have a sheep and a cow, everybody bids me good-morrow:' all which is well said by poor Richard.

"But with our industry, we must likewise be steady, and settled, and careful, and oversee our own affairs, with our own eyes, and not trust too much to others; for, as poor Richard says,

'I never saw an oft-removed tree,
Nor yet an oft-removed family,
That throve so well as one that settled be.'

And again, 'Three removes are as bad as a fire:' and again, 'Keep thy shop, and thy shop will keep thee:' and again, 'If you would have your business done, go; if not, send.' And again,

'He that by the plough would thrive,
Himself must either hold or drive.'

And again, 'The eye of the master will do more work than both his hands:' and again, 'Want of care does us more damage than want of knowledge:' and again, 'Not to oversee workmen is to leave them your purse open.' Trusting too much to others' care is the ruin of many; for, as the Almanac says, 'In the affairs of the world, men are saved not by faith, but by the want of it; but a man's own care is profitable; for,' saith poor Dick, 'Learning is to the studious, and riches to the careful, as well as power to the bold, and heaven to the virtuous.' And further, 'If you would have a faithful servant, and one that you like, serve yourself.' And again, he adviseth to circumspection and care, even in the smallest matters, because sometimes 'A little neglect may breed great mischief;' adding, 'For want of a nail the shoe was lost; for want of a shoe the horse was lost; and for want of a horse the rider was lost;' being overtaken and slain by the enemy, all for want of care about a horse-shoe nail.

"So much for industry, my friends, and attention to one's own business; but to these we must add frugality, if we would make our industry more certainly successful. A man may, if he knows not how to save as he gets, 'keep his nose all his life to the grindstone, and die not worth a groat at last.' 'A fat kitchen makes a lean will,' as poor Richard says; and,

'Many estates are spent in the getting;
Since women for tea forsook spinning and knitting,
And men for punch forsook hewing and splitting.'

"'If you would be wealthy (says he in another Almanac), think of saving, as well as of getting: the Indies have not made Spain rich, because her outgoes are greater than her incomes.'

"Away, then, with your expensive follies, and you will not have much cause to complain of hard times, heavy taxes, and chargeable families; for, as poor Dick says,

'Women and wine, game and deceit,
Make the wealth small, and the want great.'

And, further, 'What maintains one vice would bring up two children.' You may think, perhaps, that a little tea, or a little punch now and then, diet a little more costly, clothes a little finer, and a little entertainment now and then, can be no great matter; but remember what poor Richard says—'Many a little makes a mickle:' and farther, 'Beware of little expenses; a small leak will sink a great ship:' and again, 'Who dainties love shall beggars prove:' and moreover, 'Fools make feasts, and wise men eat them.'

"Here you are all got together at this sale of fineries and nic-nacks. You call them *goods;* but if you do not take care, they prove *evils* to some of you. You expect they will be sold cheap, and perhaps they may for less than they cost; but if you have no occasion for them, they must be dear to you. Remember what poor Richard says—'Buy what thou hast no need of, and ere long thou shalt sell thy necessaries.' And again, 'At a great pennyworth pause a while.' He means, that perhaps the cheapness is apparently only, or not real, or the bargain, by straitening thee in thy business, may do thee more harm than good. For in another place he says, 'Many have been ruined by buying good pennyworths.' Again, as poor Richard says, 'It is foolish to lay out money in a purchase of repentance;' and yet this folly is practised every day at auctions, for want of minding the Almanac. 'Wise men (as poor Dick says) learn by others' harms, fools scarcely by their own; but *Felix quem faciunt aliena pericula cautum.*' Many people, for the sake of finery on the back, have gone with a hungry belly, and half starved their families: 'Silk and satins, scarlet and velvets (as poor Richard says), put out the kitchen fire.' These are not the necessaries of life; they can scarcely be called the conveniences; and yet, only because they look pretty, how many want to have them! The artificial wants of mankind thus become more numerous than the natural; and as poor Dick says, 'For one poor person there are a hundred indigent.' By these and other extravagances, the genteel are reduced to poverty, and forced to borrow of those whom they formerly despised, but who, through industry and frugality, have maintained their standing; in which case it appears plainly, 'A ploughman on his legs is higher than a gentleman on his knees,' as poor Richard says. Perhaps they have had a small estate left them which they knew not the getting of; they think 'It is day, and will never be night; that a little to be spent out of so much is not worth minding.' 'A child and a fool (as poor Richard says) imagine twenty shillings and twenty years can never be spent; but always taking out of the meal-tub, and never putting in, soon comes to the bottom:' then as poor Dick says, 'When the well is dry, they know the worth of water.' But this they might have known before, if they had taken his advice: 'if you would know the value of money, go and try to borrow some; for he that goes a-borrowing goes a-sorrowing, and, indeed, so does he that lends to such people when he goes to get it in again.' Poor Dick further advises, and says,

'Fond pride of dress is sure a very curse:
Ere fancy you consult, consult your purse.'

"And again, 'Pride is as loud a beggar as Want, and a great deal more saucy.' When you have bought one fine thing, you must buy ten more, that your appearance may be all of a piece; but poor Dick says, 'It is easier to suppress the first desire than to satisfy all that follow it.' And it is as truly folly for the poor to ape the rich, as the frog to swell in order to equal the ox.

'Vessels large may venture more,
But little boats should keep near shore.'

"'Tis, however, a folly soon punished; for, 'Pride that dines on vanity sups on contempt,' as poor Richard says. And in another place, 'Pride breakfasted with Plenty, dined with Poverty, and supped with Infamy.' And, after all, of what use is this pride of appearance, for which so much is risked, so much is suffered! It cannot promote health, or ease pain; it makes no increase of merit in the person; it hastens misfortune.

'What is a butterfly? At best
He's but a caterpillar drest;
The gaudy fop's his picture just'—

as poor Richard says.

"But what madness must it be to run in debt for these superfluities! We are offered, by the terms of this sale,

six months' credit and that perhaps has induced some of us to attend it, because we cannot spare the ready money, and hope now to be fine without it. But, ah! think what you do when you run in debt. You give to another power over your liberty. If you cannot pay at the time, you will be ashamed to see your creditor; you will be in fear when you speak to him: you will make poor, pitiful, sneaking excuses, and by degrees come to lose your veracity, and sink into base downright lying; for, as poor Richard says, 'The second vice is lying; the first is running in debt.' And again, to the same purpose 'Lying rides upon debt's back;' whereas, a free-born Englishman ought not to be ashamed nor afraid to speak to any man living. But poverty often deprives a man of all spirit and virtue. 'It is hard for an empty bag to stand upright,' as poor Richard truly says. What would you think of that prince, or that government, who would issue an edict, forbidding you to dress like a gentleman or gentlewoman, on pain of imprisonment or servitude? Would you not say that you were free, have a right to dress as you please, and that such an edict would be a breach of your privileges, and such a government tyrannical? And yet you are about to put yourself under that tyranny when you run in debt for such dress! Your creditor has authority at his pleasure to deprive you of your liberty, by confining you in jail for life, or by selling you for a servant, if you should not be able to pay him. When you have got your bargain, you may perhaps think little of payment: but 'Creditors (poor Richard tells us) have better memories than debtors;' and in another place he says, 'Creditors are a superstitious sect, great observers of set days and times.' The day comes round before you are aware, and the demand is made before you are prepared to satisfy it; or if you bear your debt in mind, the term which at first seemed so long, will, as it lessens, appear extremely short. Time will seem to have added wings to his heels as well as at his shoulders. 'Those have a short Lent (saith poor Richard) who owe money to be paid at Easter.' Then since, as he says, 'The borrower is a slave to the lender, and the debtor to the creditor,' disdain the chain, preserve your freedom, and maintain your independence: be industrious and free; be frugal and free. At present, perhaps, you may think yourselves in thriving circumstances, and that you can bear a little extravagance without injury; but

> 'For age and want save while you may,
> No morning sun lasts a whole day,'

as poor Richard says. Gain may be temporary and uncertain; but ever, while you live, expense is constant and certain; and 'It is easier to build two chimneys, than to keep one in fuel,' as poor Richard says. So 'Rather go to bed supperless than rise in debt.'

> 'Get what you can, and what you get hold;
> 'Tis the stone that will turn all your lead into gold,'

as poor Richard says. And when you have got the philosopher's stone, surely you will no longer complain of bad times, or the difficulty of paying taxes.

"This doctrine, my friends, is reason and wisdom; but, after all, do not depend too much upon your own industry, and frugality, and prudence, though excellent things; for they may be blasted without the blessing of Heaven; and therefore ask that blessing humbly, and be not uncharitable to those that at present seem to want it, but comfort and help them. Remember Job suffered, and was afterwards prosperous.

"And now, to conclude, 'Experience keeps a dear school; but fools will learn in no other, and scarce in that; for it is true we may give advice, but we cannot give conduct,' as poor Richard says. However, remember this, 'They that will not be counselled cannot be helped,' as poor Richard says; and further, that 'If you will not reason, she will surely rap their knuckles.'"

Thus the old gentleman ended his harangue. The people heard it, and approved the doctrine, and immediately practised the contrary, just as if it had been a common sermon; for the auction opened, and they began to buy extravagantly, notwithstanding all his cautions and their own fear of taxes. I found the good man had thoroughly studied my Almanacs, and digested all I had dropped on those topics during the course of twenty-five years. The frequent mention he made of me must have tired every one else; but my vanity was wonderfully delighted with it, though I was conscious that not a tenth part of the wisdom was my own, which he ascribed to me, but rather the gleanings that I had made of the sense of all ages and nations. However, I resolved to be the better for the echo of it; and though I had at first determined to buy stuff for a new coat, I went away, resolved to wear my old one a little longer.

As Franklin advanced in worldly prosperity, he endeavoured to make his personal acquirements keep pace with his upward progress in society; and among other accomplishments, applied himself sedulously to the study of the dead and modern languages, of which, besides his native tongue, he as yet scarcely knew any thing. The following is his own account of his private *curriculum*:—

"I had begun in 1733 to study languages. I soon made myself so much a master of the French, as to be able to read the books in that language with ease. I then undertook the Italian. An acquaintance, who was also learning it, used often to tempt me to play chess with him. Finding this took up too much of the time I had to spare for study, I at length refused to play any more, unless on this condition, that the victor in every game should have a right to impose a task, either of parts of the grammar to be got by heart, or in translations, &c., which tasks the vanquished was to perform upon honour before our next meeting. As we played pretty equally, we thus beat one another into that language. I afterwards, with a little pains-taking, acquired as much of the Spanish as to read their books also. I have already mentioned that I had only one year's instruction in a Latin school, and that when very young, after which I neglected that language entirely; but when I had attained an acquaintance with the French, Italian, and Spanish, I was surprised to find, on looking over a Latin Testament, that I understood more of that language than I had imagined, which encouraged me to apply myself again to the study of it; and I met with the more success, as those preceding languages had greatly smoothed my way."

CIVIC PREFERMENTS AND DUTIES.

It was not to be supposed that a man of Franklin's comprehensive mind, and useful practical talents, would be allowed to remain long in the ranks of private life. Accordingly, in the year 1736, he was appointed clerk to the General Assembly of Pennsylvania. No opposition was made to his appointment the first year; but on the next election, a new member of the house opposed his return in a long speech. Franklin was, however, again elected, much to his satisfaction; for although the place was one of almost no direct emolument, it gave him an opportunity of making friends among the members, and ultimately to secure to himself the printing of most of the public papers, which was previously shared with his rivals. The new member who had resisted his re-election was a man of talents and character; and Franklin, although too independent to pay any cringing servility to him, perceived the propriety of gaining his good opinion; and the expedient he hit upon for this purpose affords another instance of his shrewdness and knowledge of human nature. Having learned that the gentleman possessed a very rare and curious book, he wrote

him a polite note, requesting that he would do him the favour of lending it for a few days. The book was immediately sent; and in about a week was returned by the borrower, with a short epistle, expressive of his gratitude for the favour. The member was so much conciliated by the circumstance, that the next time he met him in the house, he addressed him with great civility; manifested ever afterwards a great desire to serve him; and they became, in short, intimate friends. "This is another instance," observes Franklin, "of the truth of an old maxim I had learned, which says, 'He that has done you a kindness will be more ready to do you another than he whom you yourself have obliged.' And it shows how much more profitable it is prudently to remove than to resent, return, and continue, inimical proceedings." He was thereafter re-elected to the same post without opposition, for several years successively. In the following year, 1737, he supplanted his rival in trade, Bradford, in the office of deputy-postmaster for the state of Pennsylvania. These honourable preferments induced him to incline his thoughts to, and take a more active part in, public affairs than he had hitherto done.

He first turned his attention to the state of the city police, which was then in a shameful condition; and he soon effected a thorough reformation in the whole system. He suggested and promoted the establishment of a fire insurance company, the first that was projected in America. He afterwards successively exerted himself in organizing a philosophical society, an academy for the education of youth, and a militia for the defence of the province. In short, every department of the civil government, as he tells us, and almost at the same time, imposed some duty upon him. "The governor," says he, "put me into the commission of the peace; the corporations of the city chose me one of the common council; and the citizens at large elected me (1747) a burgess to represent them in assembly. This latter station was the more agreeable to me, as I grew at length tired with sitting there to hear the debates, in which, as clerk, I could take no part, and which were often so uninteresting, that I was induced to amuse myself with making magic squares, or circles, or any thing, to avoid weariness; and I conceived my becoming a member would enlarge my power of doing good. I would not, however, insinuate that my ambition was not flattered by all these promotions—it certainly was: for considering my low beginning, they were great things to me; and they were still more pleasing as being so many spontaneous testimonies of the public good opinion, and by me entirely unsolicited."

About this period (1739), the celebrated preacher Whitfield arrived at Philadelphia from Ireland. He was at first permitted to preach in some of the town churches; but the clergy soon took a dislike to him, and he was compelled to exercise his eloquence in the open streets or fields. This circumstance, however, like all displays of persecution in matters exclusively connected with private opinion, only rendered him the more popular; and the effects of his oratory speedily manifested themselves.

"It was wonderful," says Franklin, "to see the change soon made in the manners of our inhabitants. From being thoughtless or indifferent about religion, it seemed as if all the world were growing religious, so that one could not walk through the town in an evening without hearing psalms sung in different families of every street; and it being found inconvenient to assemble in the open air, subject to its inclemencies, the building of a house to meet in was no sooner proposed, and persons appointed to receive contributions, than sufficient sums were soon received to procure the ground and erect the building, which was one hundred feet long and seventy broad; and the work was carried on with such spirit as to be finished in a remarkably short time."

On leaving Philadelphia, Mr. Whitfield went, preaching all the way, through the colonies to Georgia. The settlement of that province had been recently commenced, and was attempted by people entirely unfit for such an experiment. They were unable to endure the fatigues and hardships of their situation, and perished in great numbers, leaving many helpless children with nothing to feed or clothe them. "The sight of their miserable situation," says Franklin, "inspired the benevolent heart of Mr. Whitfield, with the idea of building an orphan house there, in which they might be supported and educated. Returning northward, he preached up this charity, and made large collections; for his eloquence had a wonderful power over the hearts and purses of his hearers, of which I myself was an instance. I did not disapprove of the design; but as Georgia was then destitute of materials and workmen, and it was proposed to send them from Philadelphia at a great expense, I thought it would have been better to have built the house at Philadelphia, and brought the children to it. This I advised; but he was resolute in his first project, rejected my proposal, and I therefore refused to contribute.

"I happened soon after to attend one of his sermons, in the course of which I perceived he intended to finish with a collection, and I silently resolved he should get nothing from me. I had in my pocket a handful of copper, three or four silver dollars, and five pistoles in gold. As he proceeded, I began to soften, and concluded to give the copper. Another stroke of his oratory made me ashamed of that, and determined me to give the silver; and he finished so admirably, that I emptied my pocket wholly into the collector's dish, gold and all!"

At this time there was no military defensive force in Pennsylvania. The inhabitants were mostly Quakers, and neglected to take any measures of precaution against the dangers to which, from the French possessions in Canada, they were continually exposed. All the exertions of the governor of the province to induce the Quaker assembly to pass a militia law, proved ineffectual. Franklin thought something might be done by a subscription among the people; and to pave the way for this, he wrote and published a pamphlet called "Plain Truth." In this he clearly exposed their helpless and perilous situation, and demonstrated the necessity of cooperating for their mutual defence. The pamphlet had a sudden and surprising effect. A meeting of the citizens was held, at which proposals of the intended union, previously drawn up and printed by Franklin, were distributed about the room, to be signed by those who approved of them; and when the company separated, it was found that above twelve hundred signatures had been appended to the papers. Other copies were distributed through the province, and the subscribers at length amounted to upwards of ten thousand! All these individuals furnished themselves, as soon as they could, with arms; formed themselves into companies and regiments; chose their officers, and had themselves regularly instructed in military exercises. The women made subscriptions among themselves, and provided silk colours, which they presented to the companies, embellished with devices and mottoes furnished by Franklin. Such influence has one master-mind among his fellows in a time of emergency!

Franklin's modesty, however, was more than commensurate with his patriotism. The officers of the companies composing the Philadelphia regiment unanimously chose him for their colonel, but he declined the office in favour of a man of greater wealth and influence, who, on his recommendation, was immediately elected. These exertions of Franklin procured him great confidence from the governor and council, who consulted him on all their public measures. Notwithstanding, too, the passive principles of the Quakers, it was soon seen that

the precautions of military defence were any thing but disagreeable to them. A distinguished individual of their number, Mr. Logan, published an address declaring his approbation of defensive war, and supporting his opinion by able and elaborate arguments.

This gentleman, who came over from England when young man, as secretary to the famous William Penn, used to relate an anecdote respecting his old master, which is sufficiently amusing. During their voyage, they were chased by an armed vessel, supposed to be an enemy. Their captain prepared for defence, but told Penn and his company of Quakers that he did not expect their assistance, and that they might retire into the cabin. This notification they all complied with, excepting Logan, who remained on deck, and was quartered to a gun. The supposed enemy proved a friend, so that there was no fighting; but when the secretary carried the joyful news for his friends in the cabin, Penn reproved him severely for staying on deck, and lending his assistance in defence of the vessel, as being a breach of the principles of their society. Logan, nettled at this comment on his courageous conduct, which was made before the whole company, replied, "I being thy servant, why did thee not order me to come down? but thee was willing enough that I should stay and help to fight the ship, when thee thought there was danger!"

ELECTRICAL DISCOVERIES.

It would, perhaps, have been desirable to have followed Franklin through the remainder of his public and political career, without pausing to advert to other pursuits, entirely unconnected therewith, to which he devoted himself. We find, however, that the chronological violence of which we would in that case necessarily be guilty, would only serve to confuse our narrative. We will now, therefore, proceed to introduce him to our readers in an entirely new character from any in which they have yet seen him; for, in the language of the poet, his truly was

> "A mind so various that he seemed to be
> Not one, but all mankind's epitome."

Down to the close of the sixteenth century, all that was known of the principle of electricity, was the discovery of a power inherent in amber,* and one or two other substances, to attract to them, when rubbed, light bodies, such as small bits of paper, straw, &c. In the year 1600, Dr. Gilbert, of London, considerably enlarged the catalogue of these electrical or attractive substances, including the diamond and other precious stones, glass, sulphur, sealing-wax, rosin, &c. For above a century afterwards, however, electricity was little attended to, although Dr. Wall, Sir Isaac Newton, Guericke, and others (the latter of whom first observed the repulsive power and explosive quality of electricity), added some important facts. In 1728, it was discovered that electricity may be communicated from one body to another, even without these bodies being in contact.

The beginning of the year 1746 is memorable in the annals of electricity for the accidental discovery of the possibility of accumulating large quantities of the electric fluid, by means of what was called the Leyden jar, or phial. M. Cuneus, of that city, happened one day, while repeating some experiments which had been originally suggested by M. Von Kleist, Dean of the Cathedral in Camin, to hold in one hand a glass vessel, nearly full of water, into which he had been sending a charge from an electrical machine, by means of a wire dipped into it, and communicating with the prime conductor, or insulated non-electric, exposed in the manner we have already mentioned to the action of the excited cylinder. He was greatly surprised, upon applying his other hand to disengage the wire from the conductor, when he thought that the water had acquired as much electricity as the machine could give it, by receiving a sudden shock in his arms and breast, much more severe than any thing of the kind he had previously encountered in the course of his experiments. The same thing, it was found, took place when the glass was covered, both within and without, with any other conductors than the water and the human hand, which had been used in this instance; as, for example, when it was coated on both sides with tinfoil, in such a manner, however, that the two coatings were completely separated from each other, by a space around the lip of the vessel being left uncovered. Whenever a communication was formed by the interposition of a conducting medium between the inside and outside coating, an instant and loud explosion took place, accompanied with a flash of light, and the sensation of a sharp blow, if the conductor employed was any part of the human body. The first announcement of the wonders of the Leyden phial excited the curiosity of all Europe. The accounts given of the electric shock by those who first experienced it are perfectly ludicrous, and well illustrate how strangely the imagination is acted upon by surprise and terror, when novel or unexpected results suddenly come upon it.

The extraordinary phenomena of the Leyden jar, soon, of course, attracted the attention of Franklin, and his inquisitive mind set itself to find out the reason of such strange effects, which astonished and perplexed the ablest philosophers of Europe. Out of his speculations arose the ingenious and beautiful theory of the action of the electric influence which is known by his name, and which has ever been received as the best, because the simplest and most complete demonstration of the phenomena that has yet been propounded. His earliest inquiries were directed to ascertain the *source* of the electricity, which friction made manifest in the glass cylinder. This he demonstrated, by experiments, to be in the pores of the glass, and not in the coating, as previously supposed. After the cylinder, or phial (as it is frequently termed), was charged, he removed the coating and found that, by applying a new coating, the shock might still be received. He showed clearly, that, when charged, the cylinder contained no more electricity than before, but that as much was taken from one side as was thrown on the other, and that by making a communication between the inside and outside coating, by which, as has already been seen, a loud explosion was caused, the equilibrium was at once restored. In order to determine whether the virtue was created by the friction in the electric, or only communicated to it by other bodies, he resorted to the very simple experiment of endeavouring to electrify himself—that is to say, having insulated himself, and excited the cylinder by rubbing it with his hand, he then drew off his electricity from it in the usual manner into his own body. But he found that he was not thereby electrified at all, as he would have been by doing the same thing, had the friction been applied by another person. No spark could be elicited from him, after the operation by the presentment of a conductor. It was plain, therefore, that the electricity had passed in the first place out of his own body into the cylinder; which, therefore, in communicating it to him in the second instance, only gave back what it had received, and, instead of electrifying him, only restored him to his natural state. To prove this still farther, he insulated two individuals, one of whom he made to rub the cylinder, while the other drew the electricity from it. In this case, they were both affected; the one having given out as much electricity to the cylinder in rubbing it, as the other had drawn from it. In proof of this, he made them touch one another, when both were instantly restored to their usual state. The spark produced by their contact was also greater than that which took place when

* The term electricity is derived from the Greek word *electron*, amber

either of them was touched by an unelectrified person. From these results, then, Franklin constructed his theory, that everybody in nature has a natural quantity of electricity, which may be diminished or increased in the way we have just described. In the former case he regarded the body as *negatively*, in the latter as *positively*, electrified. In the one case it had less, in the other more, than its natural quantity of electricity; in either, therefore, supposing it to be composed of electricity and common matter, the usual equilibrium or balance between its two constituent ingredients was for the time upset or destroyed.

But to return to the Leyden phial: Franklin was not contented with merely ascertaining the principle of it. He made also a very happy application of this principle, which afforded a still more wonderful manifestation than had yet been obtained of the powers of accumulated electricity. Considering the waste that took place, in the common experiment, of the fluid expelled, during the process of charging, from the exterior coating, he conceived the idea of employing it to charge the inner surface of a second jar, which he effected, of course, by the simple expedient of drawing it off by means of a metal rod communicating with that surface. The electricity expelled from the outside of this second jar was conveyed, in like manner, into the inside of a third; and in this way, a great number of jars were charged with the same facility as a single one. Then, having connected all the inside coatings with one conductor, and all the outside coatings with another, he had merely to bring these two general conductors into contact or communication, in order to discharge the whole accumulation at once. This contrivance he called an *Electrical Battery*. The general sketch we have thus given will put the reader in possession at least of the great outlines of the Franklinian theory of electricity, undoubtedly one of the most beautiful generalizations to be found in the whole compass of science.

We now advert to another brilliant discovery by this illustrious philosopher, namely, the similarity between lightning and electricity. The Abbé Nollet had, before him, hinted his suspicions of this resemblance, but only in the most loose and distant way.

In a paper, dated Nov. 7, 1749, Franklin enumerates all the known points of resemblance between lightning and electricity. In the first place, he remarks, it is no wonder that the effects of the one should be so much greater than those of the other; for if two gun-barrels electrified will strike at two inches' distance, and make a loud report, at how great a distance will ten thousand acres of electrified cloud strike, and give out fire; and how loud must be that crack! He had known for some time the extraordinary power of pointed bodies, both in drawing and in throwing off the electric fire. The true explanation of this fact did not occur to him; but it is a direct consequence of the fundamental principle of his own theory, according to which the repulsive tendency of the particles of electricity towards each other, occasioning the fluid to retire, in every case, from the interior to the surface of bodies, drives it with especial force towards points and other prominences, and thus favours its escape through such outlets; while, on the other hand, the more concentrated attraction which the matter of a pointed body, as compared with that of a blunt one, exerts upon the electricity to which it is presented, brings it down into its new channel in a denser stream. In possession, however, of the fact, we find him concluding the paper we have mentioned as follows:—"The electric fluid is attracted by points. We do not know whether this property be in lightning; but since they agree in all the particulars in which we can already compare them, it is not improbable that they agree likewise in this. Let the experiment be made."

Full of this idea, his attention was one day drawn to a kite which a boy was flying, and it suddenly occurred to him that here was a method of reaching the clouds preferable to any other. Accordingly, he immediately took a large silk handkerchief, and stretching it over two cross sticks, formed in this manner his simple apparatus for drawing down the lightning from its cloud. Soon after, seeing a thunder storm approaching, he took a walk into a field in the neighbourhood of the city, in which there was a shed, communicating his intentions, however, to no one but his son, whom he took with him to assist him in raising the kite: this was in June, 1752.

The kite being raised, he fastened a key to the lower extremity of the hempen string, and insulating it by attaching it to a post by means of silk, he placed himself under the shed, and waited the result. For some time no signs of electricity appeared. A cloud, apparently charged with lightning, had even passed over them without producing any effect. At length, however, just as Franklin was beginning to despair, he observed some loose threads of the hempen string rise and stand erect, exactly as if they had been repelled from each other by being charged with electricity. He immediately presented his knuckle to the key, and, to his inexpressible delight, drew from it the well-known electrical spark. He said afterwards that his emotion was so great at this completion of a discovery which was to make his name immortal, that he heaved a deep sigh, and felt that he could that moment have willingly died. As the rain increased, the cord became a better conductor, and the key gave out its electricity copiously. Had the hemp been thoroughly wet, the bold experimenter might, as he was contented to do, have paid for his discovery with his life. He afterwards brought down the lightning into his house, by means of an insulated iron rod, and performed with it, at his leisure, all the experiments that could be performed with electricity. But he did not stop here. His active and practical mind was not satisfied even with the splendid discovery, until he had turned it to a useful end. It suggested to him, as is well known, the idea of a method of preserving buildings from lightning, which is extremely simple and cheap, as well as effectual, consisting, as it does, in nothing more than attaching to the building a pointed metallic rod, rising higher than any part of it, and communicating at the lower end with the ground. This rod the lightning is sure to seize upon, in preference to any part of the building; by which means it is conducted to the earth, and prevented from doing any injury. There was always a strong tendency in Franklin's philosophy to these practical applications.

Franklin's discoveries did not at first attract much attention in England; and, in fact, he had the mortification to hear that his paper on the similarity between lightning and electricity had been ridiculed when read in the Royal Society. Having fallen, however, into the hands of the naturalist Buffon, that celebrated man translated and published it in Paris, when it speedily excited the astonishment of all Europe. What gave his book the more sudden and general celebrity, was the success of one of its proposed experiments for drawing lightning from the clouds, made at Marley. This engaged the public attention everywhere. "The Philadelphia experiments," as they were called, were performed before the king and court, and all the curious of Paris flocked to see them. Dr. Wright, an English physician, being at Paris at the time, wrote to a member of the Royal Society of London, with an account of these wonders, and stating the surprise of all the learned men abroad of Franklin's writings being so little noticed in England. The society were thus in a manner compelled to pay more attention to what they had previously considered as chimerical speculations, "and soon," says Franklin, "made me more than amends for the slight with which they had before treated me. Without my having made any application for that honour, they chose

me a member, and voted that I should be excused the customary payments, which would have amounted to twenty-five guineas, and ever since have given me their Transactions gratis. They also presented me with the gold medal of Sir Godfrey Copley for the year 1753, the delivery of which was accompanied with a very handsome speech of the president, Lord Macclesfield, wherein I was highly honoured."

Although the numerous important public duties which Franklin was called upon latterly to discharge, chiefly engrossed his time, he still returned to his philosophical studies on every occasion that offered, and made several curious and interesting discoveries.

Perhaps no philosopher ever stood on a prouder eminence in the world's eye than Franklin during the latter half of his life. The obscurity of his origin served but to make his elevation the more brightly conspicuous; and honours were showered on him from all quarters of the civilized world. In 1757 he visited England, and before his return made a tour in Scotland, where he formed an intimacy with Lord Kames, and had the degree conferred upon him of Doctor of Laws by the University of St. Andrews. In 1764 he again visited England, from which he proceeded to the continent of Europe. In Holland, Germany, and France, he was received with the greatest testimonies of respect from all men of science and distinction. At Paris Louis XV. honoured him with the most distinguished marks of his favour.

POLITICAL CAREER.

This part of Franklin's life need only be very generally touched on, the scenes and transactions in which he bore a part having long since become matter of history, with which almost every individual is now more or less acquainted. We have before mentioned that he was elected a member of the General Assembly of Pennsylvania, as burgess for the city of Philadelphia, in 1747. Warm disputes at this time subsisted between the assembly and the proprietaries,* each contending for what they conceived to be their just rights. Franklin, a friend of the interests of *the many* from his infancy, speedily distinguished himself as a steady opponent of the claims of the proprietaries, and he was soon looked up to as the head of the opposition. His influence with the assembly is said to have been very great. This arose not from any superior powers of elocution; he spoke but seldom, and he never was known to make any thing like an elaborate harangue. "His speeches," says his intimate friend, the late Dr. Stuber of Philadelphia, "frequently consisted of but a single sentence, or of a well-told story, the moral of which was always obviously to the point. He never attempted the flowery fields of oratory. His manner was plain and mild; his style of speaking was, like that of his writings, simple, unadorned, and remarkably concise. With this plain manner, and his penetrating and solid judgment, he was able to confound the most eloquent and subtle of his adversaries, to confirm the opinions of his friends, and to make converts of the unprejudiced who had opposed him. With a single observation he has rendered of no avail an elegant and lengthy discourse, and determined the fate of a question of importance."

Franklin had conducted himself so well in the office of postmaster for the state of Pennsylvania, and had shown himself so well acquainted with the business of that department, that it was thought expedient to raise him to a more dignified station. In 1753, he was appointed deputy-postmaster-general for the British colonies. It is said that the revenue from this source, in Franklin's hands, yielded to Great Britain three times as much as that of Ireland. In 1754, Franklin drew up the celebrated "Albany Plan of Union," the purpose of which was the establishment of a general government in the colonies, to be administered by a president-general, appointed by the crown, and by a grand council, consisting of members chosen by the representatives of the different colonies; the whole executive authority to be committed to the president-general; the legislative to the grand council and president jointly; and all laws to be approved of by the king. This plan was unanimously approved of by the commissioners for the crown and the colonies appointed to consult on the question, but its final fate was singular. It was rejected by the ministry of Great Britain as too democratical, and by every local assembly as too despotic. These verdicts were, perhaps, the best proof of its excellence, and of its having steered exactly in the middle betwixt the interests of both.

The British government having thus rejected a proposal of internal defence in the colonies, they were soon obliged to adopt measures of another sort for their protection. Aggressive operations were again threatened by the French; and in 1754, General Braddock was despatched from England with two regiments of regular English troops to resist them. The troops were landed at Alexandria, and marched thence to Fredericktown in Maryland, where they halted for carriages to transport their baggage, ammunition, &c., to the frontiers. Great reluctance was manifested by the country people to supply these, and, in fact, so few were sent in, and so many other difficulties occurred, that the general was about to abandon the expedition altogether. In this dilemma he was fortunately joined by Franklin, who, aware of the necessity and importance of the expedition, asked General Braddock what recompense he would afford to the owners for the use of their wagons and horses. General Braddock referred the terms to himself; they were drawn up and accepted; and Franklin immediately published them in an advertisement, with an animated appeal from himself to the loyalty and patriotism of his countrymen. The consequence was, that, in two weeks, 150 wagons and 260 horses poured into the camp, the owners of which, however, declined the security of the British commander for compensation, and insisted on having the personal bond of Franklin. This he accordingly gave them, and even advanced several hundred pounds of his own in present payment.

The expedition accordingly set forward, and its disastrous issue must still be well remembered. Although a brave man, Braddock had far too much confidence in the prowess of his regular troops, and too much contempt for the Americans and Indians. About one hundred of the latter joined him on his march, who would have proved of the utmost use to him as guides and scouts, but he treated them so slightingly that they all left him. No appearance of the enemy was seen until the troops had penetrated far into the interior; and the first intelligence which they had of the approach of a foe, was in finding that they had fallen into an ambuscade, where they were mowed down in hundreds by invisible antagonists secreted among the trees and bushes. A general rout and confusion almost immediately ensued. The drivers cut their horses' traces and fled, abandoning the wagons, which also obstructed the retreat of the soldiers. The general was with difficulty brought off, severely wounded; and, out of eighty-six officers, sixty-three was killed or wounded, with seven hundred and fourteen privates killed, out of eleven hundred who fell in the snare. All the artillery and stores, of course, were left to the enemy.

As soon as the news of the defeat, and the loss of the wagons and horses, became generally known, the owners came in a body upon Franklin for the amount of their claims, for which he had given bond, amounting to nearly £20,000! It was with difficulty that many of these claimants were prevented from suing him, until government had time to examine into their charges and order

* The descendants of the original settlers who had received grants of land from the British government, who claimed exemption from all taxes, and other privileges.

payment; but the matter was at length satisfactorily settled.

The assembly now laid a tax, to raise money for the defence of the province, and Franklin was appointed one of the commissioners to dispose of it. He had also carried a bill through the house for establishing and disciplining a voluntary militia. To promote the association necessary to form the militia, he wrote a dialogue upon the subject, which was extensively circulated, and thought to have great effect. While the several companies in the city and country were forming and learning their exercise, the governor prevailed upon Franklin to take charge of the north-western frontier, which was infested by the enemy, and provide for the defence of the inhabitants, by raising troops, and building a line of forts. Franklin did not think himself very well qualified for the military, but was willing to be of all the service in his power. He received a commission from the governor, with full authority, and a parcel of blank commissions for officers, to be given to whom he thought fit. Five hundred and sixty men were soon raised and placed under his command.

The first place selected for the erection of a fort was Gnadenhutten, a small settlement of Moravians; and thither Franklin set out in the middle of winter, amid torrents of rain, and through almost impassable roads. Upon arriving at the village, he lost not a moment in planning and marking out the fort, with a circumference of 455 feet; and the men were instantly set to work with their axes to cut down trees for palisades. Seeing the trees fall so fast, Franklin had the curiosity to look at his watch when two men began to cut at a pine. In six minutes they had it upon the ground, and it was fourteen inches in diameter. Each pine made three palisades, of eighteen feet long, pointed at one end. While these were preparing, other men dug a trench all round, of three feet deep, in which the palisades were to be planted. When these were set up, the carpenters built within them a platform of boards all round, about six feet high, for the men to stand on and fire through the loopholes. They had one swivel gun, which they mounted, and fired as soon as it was fixed, that the Indians might know they had such pieces. Thus their fort, such as it was, was finished in a week, though it rained so hard every other day that the men were almost unable to work.

"This gave me occasion to observe," says Franklin, "that when men are employed they are best contented. For on the days they worked, they were good-natured and cheerful, and, with the consciousness of having done a good day's work, they spent the evening gayly. But, on our idle days, they were mutinous and quarrelsome, finding fault with the pork and the bread, and were continually in bad humour; which put me in mind of a sea captain, whose rule it was to keep his men constantly at work; and, when his mate once told him that they had done every thing, and there was nothing further to employ them about, 'Oh,' said he, '*make them scour the anchor.*'

"This kind of fort," he continues, "however contemptible, is a sufficient defence against Indians, who have no cannon. Finding ourselves now posted securely, and having a place to retreat to on occasion, we ventured out in parties to scour the adjacent country. We met with no Indians, but we found the places on the neighbouring hills where they had lain to watch our proceedings. There was an art in their contrivance of those places that seems worth mentioning.

"It being winter, a fire was necessary for them; but a common fire, on the surface of the ground, would by its light have discovered their position at a distance: they had therefore dug holes in the ground about three feet in diameter, and somewhat deeper; we found where they had, with their hatchets, cut off the charcoal from the side of burnt logs lying in the woods. With these coals they had made small fires in the bottom of the holes, and we observed among the weeds and grass the prints of their bodies made by their lying all round, with their legs hanging down in the holes to keep their feet warm, which with them is an essential point. This kind of fire, so managed, could not discover them either by its light, flame, sparks, or even smoke; it appeared that the number was not great, and it seems they saw we were too many to be attacked by them with a prospect of advantage.

"We had for our chaplain a zealous Presbyterian minister, Mr. Beatty, who complained to me that the men did not generally attend his prayers and exhortations. When they enlisted they were promised, besides pay and provisions, a gill of rum a-day, which was punctually served out to them, half in the morning and half in the evening, and I observed they were punctual in attending to receive it." Franklin advised that the rum should be distributed only just after prayers; and never were prayers more generally or more punctually attended.

Franklin's military career, was, however, a short one, for he had scarcely completed his defensive preparations, when he received a summons to attend the assembly, where his advice and assistance were found indispensable.

The disputes between the proprietaries and the people, before referred to, continued to increase in 1755 and 1756, although a war was then raging on the frontiers —the French having still possession of Canada. The popular assemblies insisted on the justice of taxing the proprietary estates; but the governors constantly refused to assent to such a measure. The assemblies at last resolved to appeal to the mother country; and a petition was accordingly made out, addressed to the king in council. Franklin was appointed to present this address, as agent for the province of Pennsylvania, and departed for England in June, 1757. During this time, the governor passed a law imposing a tax, in which no discrimination was made in favour of the estates of the Penn family which were immensely large. The Penns thereupon used their most strenuous exertions to prevent its passing into a law. After long debate and deliberation, a proposal was made that Franklin should *personally* engage that the proprietary estates should pay no more than a just proportion of the tax. This he agreed to do—the proprietaries withdrew their opposition, and tranquillity was once more restored to the province. The manner in which this dispute was terminated sufficiently evinces the high confidence entertained of Franklin's honour and integrity, even by those opposed to his political views. After this, Franklin remained some time at the British court, having, besides Pennsylvania, been also appointed agent for the states of Massachusetts, Maryland, and Georgia.

The French in Canada still continuing to molest and interrupt the trade of the other colonies, Franklin published his famous Canada pamphlet, in which he in a forcible manner pointed out the advantages which would result from the conquest of that province. An expedition was accordingly sent out under General Wolfe, the result of which is well known. At the treaty in 1762, France ceded Canada to Great Britain, and by her cession of Louisiana at the same time, relinquished all her possessions on the continent of America.

In the summer of 1762, Franklin returned to America, and received the thanks of the Assembly of Pennsylvania, as well for the faithful discharge of his duty to that province in particular, as for the many and important services done to America in general, during his residence in Great Britain. A compensation of £5000, Pennsylvania currency, was likewise decreed him for the services he had performed in England. He was also immediately re-elected to his seat in the assembly.

Upon the breaking out of the fatal disturbances in consequence of Mr. Grenville's Stamp Act, Franklin had again returned to England, as agent for Pennsylvania and other states. During his residence in England, he consulted, with unremitting industry, the best interests of his native country. He was everywhere received with respect, on account of his reputation as a writer and philosopher. Franklin was unwearied in his efforts to bring about a reconciliation. He had frequent interviews with Lord Howe and Lord Chatham, and other distinguished English statesmen, who entertained for him the highest respect and esteem. Most of the time during his present residence in England was occupied in these vain efforts. It is well known that the first violent demonstrations against the imposition of the Stamp Act, broke out in Franklin's native place, Boston, the capital of the state of Massachusetts. The governor, Hutchinson, and other functionaries, wrote to the home government, recommending the adoption of the most rigorous coercive measures, inveighing in unmeasured terms against the leading characters of the state. By some unaccountable means, these letters fell into Franklin's hands ere they reached their destination. He instantly transmitted them back to the assembly at Massachusetts, who, enraged at the conduct of the governor, sent a petition to the king, praying for his dismissal, and Franklin was appointed to present it. As might have been expected, the petition was dismissed as "frivolous and vexatious;" and Franklin incurred so much obloquy for his interception of the governor's despatches (the mode of which was never discovered), that he was dismissed from his office of deputy-postmaster-general. He still continued in England, however, and left nothing untried to effect a reconciliation between the mother country and the colonies; but finding all his endeavours unavailing, he returned to America in 1775. The day after his arrival, he was elected by the legislature of Pennsylvania as a delegate to Congress. Hostilities had then commenced; but it would be repeating a thrice-told tale to enter into any account of the protracted and bloody struggle that ensued, or the nature of its termination. In 1778, Franklin was sent as ambassador to the court of France, where he soon brought about an alliance between that nation and the North American states. When the British ministry at length saw the necessity of recognising the independence of the states, the definitive treaty to that effect was signed at Paris, on the 3d of September, 1783, by Dr. Franklin, Mr. Adams, and Mr. Jay, for the states, on the one hand; and by Mr. David Hartley, for Great Britain, on the other. Franklin continued at Paris for the two following years; but at last, by his own urgent request, was recalled. Shortly after his return, he was elected president of the supreme executive council, and lent all his still perfect energies to consolidating the infant government. Age and infirmities, however, claimed their usual ascendency; and in 1788 he retired wholly from public life.

DEATH.

Franklin's last public act—and it was one in beautiful accordance with the whole tenor of his life—was putting his signature, as president of the Anti-Slavery Society, to a memorial presented to the House of Representatives, praying them to exert the full powers intrusted to them to discourage the revolting traffic in the human species. This was on the 12th of February, 1789. From this day forward, he was confined almost constantly to bed with the stone, from which he suffered the most excruciating agony. Yet, when his paroxysms of pain drew forth, as they did occasionally, an irrepressible groan, he would observe, he was afraid he did not bear his sufferings as he ought—acknowledged his grateful sense of the many blessings he had received from the Supreme Being, who had raised him from small and low beginnings to such high rank and consideration among men, and made no doubt but his present afflictions were kindly intended to wean him from a world in which he was no longer fit to act the part assigned him. He latterly sunk into a calm lethargic state; and, on the 17th April, 1790, about eleven o'clock at night, he quietly expired. He was then aged exactly eighty-four years and three months. The following epitaph was written by himself many years previous to his death, [but only the simple inscription "Benjamin and Deborah Franklin, 1790," was placed upon the plain marble slab that covers his grave.—*Am. Ed.*]

"The Body of Benjamin Franklin, Printer, [like the cover of an old book, its contents torn out, and stript of its lettering and gilding], lies here food for worms; yet the work itself shall not be lost, for it will (as he believed) appear once more in a new and more beautiful edition, corrected and amended by The Author."

CHARACTER.

In looking back on Franklin's career, it is evident that the principal feature in his character was *worldly prudence*—not in the usual and selfish acceptation of the term, but that prudence, founded on true wisdom, which dictates the practice of honesty, industry, frugality, temperance, in short, all those qualities which may be classified under the name of "moral virtues"—as being the only certain means of obtaining distinction, respect, independence and mental cheerfulness. There is no other writer who inculcates lessons of practical wisdom in a more agreeable and popular manner, and we much regret that the limits of this sheet prevent our giving many extracts illustrative of this quality. His whole conduct and writings, indeed, present the somewhat singular union of great genius with practical good sense, and of singular worldly shrewdness with the loftiest integrity of principle. The greatest worldly honours—and few have attained higher—could not for a moment make him forget or deviate from the fixed principles with which he started in life. Ever keeping before his mind his own origin and rise, he justly considered every man to be originally on a par in as far as regarded real intrinsic worth; and equally, by precept and example, contributed more, perhaps, than any individual who ever existed, to breaking down these invidious bars to eminence and success in life which the conventional habits and artificial feelings of society had theretofore interposed to the elevation of those unblessed by birth and fortune.

As the present biography must be considered as more immediately instructive to the industrious and productive portion of mankind, we shall conclude it by giving the following "Advice to a Young Tradesman," written by Franklin at the time when his industrious and frugal habits were just beginning to be rewarded with independence and worldly respect.

"Remember that *time* is money. He that can earn ten shillings a-day by his labour, and goes abroad, or sits idle one-half of that day, though he spends but sixpence during his diversion or idleness, ought not to reckon *that* the only expense; he has really spent, or rather thrown away, five shillings besides.

"Remember that *credit* is money. If a man lets his money lie in my hands after it is due, he gives me the interest, or so much as I can make of it during that time. This amounts to a considerable sum where a man has a good and large credit, and makes good use of it.

"Remember that money is of a prolific generating nature. Money can beget money, and its offspring can beget more, and so on. Five shillings turned is six, turned again is seven and threepence; and so on till it becomes a hundred pounds. The more there is of it, the more it produces every turning, so that the profits rise quicker and quicker. He that kills a breeding sow

destroys all her offspring to the thousandth generation. He that murders a crown destroys all that it might have produced, aven scores of pounds.

"Remember that six pounds a year is but a groat a day. For this little sum (which may be daily wasted either in time or expense, unperceived) a man of credit may, on his own security, have the constant possession and use of a hundred pounds. So much in stock, briskly turned by an industrious man, produces great advantage.

"Remember this saying, 'The good paymaster is lord of another man's purse.' He that is known to pay punctually, and exactly to the time he promises, may at any time, and on any occasion, raise all the money his friends can spare. This is sometimes of great use. After industry and frugality, nothing contributes more to the raising of a young man in the world than punctuality and justice in all his dealings: therefore, never keep borrowed money an hour beyond the time you promised, lest a disappointment shut up your friend's purse for ever.

"The most trifling actions that affects a man's credit are to be regarded. The sound of your hammer at five in the morning, or nine at night heard by a creditor, makes him easy six month's longer; but if he sees you at a billiard-table, or hears your voice at a tavern, when you should be at work, he sends for his money the next day; demands it before he can receive it in a lump.

"It shows, besides, that you are mindful of what you owe; it makes you appear a careful as well as an honest man, and that still increases your credit.

"Beware of thinking all your own that you possess, and of living accordingly. It is a mistake that many people who have credit fall into. To prevent this, keep an exact account, for some time, both of your expenses and your income. If you take the pains at first to mention particulars, it will have this good effect—you will discover how wonderfully small trifling expenses mount up to large sums, and will discern what might have been, and may for the future be saved, without occasioning any great inconvenience.

In short, the way to wealth, if you desire it, is as plain as the way to market. It depends chiefly on two words—*industry* and *frugality*; that is, waste neither *time* nor *money*, but make the best use of both. Without industry and frugality nothing will do, and with them every thing. He that gets all he can honestly, and saves all he gets (necessary expenses excepted), will certainly become *rich*—if that Being who governs the world, to whom all should look for a blessing on their honest endeavours, doth not, in his wise providence, otherwise determine."

About forty years later, after a long life of experience, he penned the following similar admonitions, entitled, "Necessary Hints to those that would be Rich:"—

"The use of money is all the advantage there is in having money.—For six pounds a year you may have the use of one hundred pounds, provided you are a man of known prudence and honesty. He that spends a groat a day idly, spends idly about six pounds a year, which is the price for the use of one hundred pounds.—He that wastes idly a groat's worth of his time per day, one day with another, wastes the privilege of using one hundred pounds each year.—He that idly loses five shillings' worth of time, loses five shillings, and might as prudently throw five shillings into the sea.—He that loses five shillings, not only loses that sum, but all the advantages that might be made by turning it in dealing; which, by the time that a young man becomes old, will amount to a considerable sum of money.—Again, he that sells upon credit, asks a price for what he sells equivalent to the principal and interest of his money for the time he is to be kept out of it; therefore, he that buys upon credit, pays interest for what he buys; and he that pays ready money, might let that money out to use; so that he that possesses any thing he has bought, pays interest for the use of it.—Yet, in buying goods, it is best to pay ready money, because he that sells upon credit expects to lose five per cent. by bad debts; therefore, he charges, on all he sells upon credit, an advance that will make up that deficiency. Those who pay for what they buy upon credit, pay their share of this advance. He that pays ready money escapes, or may escape, that charge."

PRESERVATION OF HEALTH.

A HUMAN being, supposing him to be soundly constituted at first, will continue in health till he reaches old age, provided that certain conditions are observed, and no injurious accident shall befall. This is a proposition so well supported by an extensive observation of facts, that it may be regarded as established. It becomes, of course, important to ascertain what are the conditions essential to health, in order that, by their observance, we may preserve for ourselves what is justly esteemed as the greatest of earthly blessings, and dwell for our naturally appointed time upon the earth. A general acquaintance with these conditions may be easily attained by all, and to pay them obedience is much more within the power of individuals than is generally supposed.

The leading conditions essential to health may be thus enumerated:—1. A constant supply of pure air; 2. A sufficiency of nourishing food, rightly taken; 3. Cleanness; 4. A sufficiency of exercise to the various organs of the system; 5. A right temperature; 6. A sufficiency of cheerful and innocent enjoyments; and, 7. Exemption from harassing cares.

AIR.

The common air is a fluid composed mainly of two gases, in certain proportions; namely, oxygen as 20 and nitrogen as 80 parts in a hundred, with a very minute addition of carbonic acid gas. Such is air in its pure and right state, and such is the state in which we require it for respiration. When it is loaded with any admixture of a different kind, or its natural proportions are in any way deranged, it cannot be breathed without producing injurious results. We also require what is apt to appear a large quantity of this element of healthy existence. The lungs of a healthy full-grown man will inhale the bulk of twenty cubic inches at every inspiration, and he will use no less than fifty-seven hogsheads in twenty-four hours.

Now, there are various circumstances which tend to surround us at times with vitiated air, and which must accordingly be guarded against. That first calling for attention is the miasma or noxious quality imparted to the air in certain districts by stagnant water and decay-

ing vegetable matter. It is now generally acknowledged that this noxious quality is in reality a subtle poison, which acts on the human system through the medium of the lungs, producing fevers and other epidemics. A noted instance of its acting on a great scale is presented in the Campagna di Roma, where a large surface is retained in a marshy state. The air arising from that territory at certain seasons of the year, obliges the inhabitants of the adjacent districts of the city to desert their homes, in order to escape its pernicious influence. All marshes, and low damp grounds of every kind, produce more or less miasma, and it is consequently dangerous to live upon or near them. Slightly elevated ground should, accordingly, in all cases, be chosen for both single houses and towns. Tanks and collections of water of every kind are dangerous beneath or near a house, because, unless their contents be constantly in a state of change, which is rarely the case, their tendency is to send up exhalations of a noxious kind. A few years ago, the eldest son of an English nobleman—a youth of great promise, and who had recently become a husband and father—died of a fever which was traced to the opening of an old reservoir of water underneath the country-house in which he dwelt.*

Putrid matter of all kinds is another conspicuous source of noxious effluvia. The filth collected in ill-regulated towns—ill-managed drains—collections of decaying animal substances, placed too near or within private dwellings—are notable for their effects in vitiating the atmosphere, and generating disease in those exposed to them. In this case, also, it is a poison diffused abroad through the air which acts so injuriously on the human frame. This was probably the main cause of the plagues which visited European cities during the middle ages. In those days there were no adequate provisions for cleaning cities, and the consequence was, that large collections of filth were accumulated. The noxious air diffused by these means through the narrow streets and confined dwellings would tend to the most fatal effects. In old drains there is generated a gas (sulphureted hydrogen), which is calculated to produce dreadful consequences among those exposed to it. It has lately been discovered, that it is the presence of this gas in the sea near the eastern coast of tropical Africa, which causes the peculiar unhealthiness of that region. It is ascertained that small animals, such as birds, die, when the air they breathe contains one fifteen-hundredth part of sulphureted hydrogen, and that an infusion six times greater will kill a horse. It follows, that we can scarcely attach too much importance to measures for cleaning cities and improving drains. There are as yet no large towns in Britain kept in a state so clean as is desirable for the health of their inhabitants; and the metropolis itself is among those which are most defective in this respect.

The human subject tends to vitiate the atmosphere for itself, by the effect which it produces on the air which it breathes. Our breath, when we draw it in, consists of the ingredients formerly mentioned; but it is in a very different state when we part with it. On passing into our lungs, the oxygen, forming the lesser ingredient, enters into combination with the carbon of the venous blood (or blood which has already performed its round through the body); in this process, about two-fifths of the oxygen is abstracted and sent into the blood, only the remaining three-fifths being expired, along with the nitrogen nearly as it was before. In place of the oxygen consumed, there is expired an equal volume of carbonic acid gas, such gas being a result of the process of combination just alluded to. Now, carbonic acid gas, in a larger proportion than that in which it is found in the atmosphere, is noxious. The volume of it expired by the lungs, if free to mingle with the air at large, will do no harm; but, if breathed out into a close room, it will render the air unfit for being again breathed. Suppose an individual to be shut up in an air-tight box: each breath he emits throws a certain quantity of carbonic acid gas into the air filling the box; the air is thus vitiated, and every successive inspiration is composed of worse and worse materials, till at length the oxygen is so much exhausted that it is insufficient for the support of life. He would then be sensible of a great difficulty in breathing, and in a little time longer he would die.

Most rooms in which human beings live are not strictly close. The chimney and the chinks of the door and windows generally allow of a communication to a certain extent with the outer air, so that it rarely happens that great immediate inconvenience is experienced in ordinary apartments from want of fresh air. But it is at the same time quite certain that, in all ordinary apartments where human beings are assembled, the air unavoidably becomes *considerably vitiated*, for in such a situation there cannot be a sufficiently ready or copious supply of oxygen to make up for that which has been consumed, and the carbonic acid gas will be constantly accumulating. This is particularly the case in bedrooms, and in theatres, churches, and schools. An extreme case was that of the celebrated Black Hole of Calcutta, where a hundred and forty-six persons were confined for a night in a room eighteen feet square with two small windows. Here the oxygen scarcely sufficient for the healthy supply of one person, was called upon to support a large number. The unfortunate prisoners found themselves in a state of unheard-of suffering, and in the morning all were dead but twenty-three, some of whom afterwards sunk under putrid fever brought on by breathing so long a tainted atmosphere.

Although the vitiation of the air in ordinary apartments and places of public assembly does not generally excite much attention, it nevertheless exercises a certain unfavourable influence on health in all the degrees in which it exists. Perhaps it is in bedrooms that most harm is done. These are generally smaller than other rooms, and they are usually kept close during the whole night. The result of sleeping in such a room is very injurious. A common fire, from the draught which it produces, is very serviceable in ventilating rooms, but it is at best a defective means of doing so. The draught which it creates generally sweeps along near the floor between the door and the fire, leaving all above the level of the chimney-piece unpurified. Yet scarcely any other arrangement is anywhere made for the purpose of changing the air in ordinary rooms. To open the window is a plan occasionally resorted to, but it is not always agreeable in our climate, and sometimes it produces bad consequences of a different kind.

It would nevertheless be easy to produce an effective draught from any room in which a fire is kept. It is only necessary to make an aperture into the flue, near the ceiling of the room, and insert therein a tin tube, with a valve at the exterior, capable of opening inwards, but closing when at rest or a draught is sent the contrary way. The draught produced by the fire in the flue would cause a constant flow of air out of the *upper part* of the room (where most vitiated); and the valve would be an effectual protection against back-smoke, should there be the least tendency to it. This plan is adopted in Buckingham Palace. It could be applied to any existing house at a mere trifle of expense.

A more effectual plan, and one which operates when there is no fire in the room, is to establish a tin tube of two or three inches diameter out of each apartment to be ventilated, causing them all to meet in one general tube, the extremity of which passes into some active flue—for example, that of the kitchen, which is rarely cold. Thus there might be a constant passing of fresh

* Viscount Milton, son of the present Earl Fitzwilliam, was the person here alluded to

ah into and through every room of a large house, so that it would be at all times as healthy in this respect as the open fields. At the same time, the supply might, by means of graduated valves, be regulated to any degree which might be deemed agreeable.

FOOD.

The second requisite for the preservation of health is a sufficiency of nutritious food.

Organic bodies, in which are included vegetables as well as animals, are constituted upon the principle of *a continual waste of substance supplied by continual nutrition.*

The Nutritive System of animals, from apparently the humblest of these to the highest, comprehends an *alimentary tube or cavity*, into which food is received, and from which, after undergoing certain changes, it is diffused by means of smaller vessels throughout the whole structure. In the form of this tube, and in the other apparatus connected with the taking of food, there are, in different animals, varieties of structure, all of which are respectively in conformity with peculiarities in the quality and amount of food which the particular animals are designed to take. The harmony to be observed in these arrangements is remarkably significant of that Creative design to be traced in all things.

MAN DESIGNED TO LIVE ON A MIXED DIET.

Some animals are formed to live upon vegetable substances alone; others are calculated to live upon the flesh of other animals. Herbivorous animals, as the former are called, have generally a long and complicated alimentary tube, because the nutritious part of such food, being comparatively small in proportion to the whole bulk, requires a greater space in which to be extracted and absorbed into the system. The sheep, for example, has a series of intestines twenty-seven times the length of its body. For the opposite reasons, carnivorous or flesh-devouring animals, as the feline tribe of quadrupeds, and the rapacious birds, have generally a short intestinal canal. The former class of animals are furnished with teeth, calculated by their broad and flat surfaces, as well as by the lateral movement of the jaws in which they are set, to mince down the herbage and grain eaten by them. But the carnivorous animals, with wide-opening jaws, have long and sharp fangs to seize and tear their prey. These peculiarities of structure mark sufficiently the designs of nature with respect to the kinds of food required by the two different classes of animals for their support.

The human intestinal canal being of medium length, and the human teeth being a mixture of the two kinds, it necessarily follows that man was designed to eat both vegetable and animal food. As no animal can live agreeably or healthy except in conformity with the laws of its constitution, it follows that man will not thrive unless with a mixture of animal and vegetable food. The followers of Pythagoras argued, from the cruelty of putting animals to death, that it was proper to live on vegetables alone, and many eccentric persons of modern times have acted upon this rule. But the ordinances of Nature speak a different language; and, if we have any faith in these, we cannot for a moment doubt that a mixture of animal food is necessary for our well-being. On the other hand, we cannot dispense with vegetable food, without injurious consequences. In that case we place in a medium alimentary canal a kind of food which is calculated for a short one, thus violating an arrangement of the most important nature. A balance between the two kinds of food is what we should observe, if we would desire to live a natural and consequently healthy life.

RULES CONNECTED WITH EATING.

In order fully to understand how to eat, what to eat, and how to conduct ourselves after eating, it is necessary that we should be acquainted in some measure wi the *process of nutrition*—that curious series of operations by which food is received and assimilated by our system in order to make good the deficiency produced by waste

"Food is first received into the mouth, and there the operations in question may be said to commence. It is there to be chewed (or masticated) and mixed with saliva, preparatory to its being swallowed or sent into the stomach. Even in this introductory stage, there are certain rules to be observed. Strange as it may appear, to know *how to eat* is a matter of very considerable importance.

Many persons, thinking it all a matter of indifference, or perhaps unduly anxious to despatch their meals, eat very fast. If we are to believe the accounts of travellers, the whole of the mercantile classes in New England eat hurriedly, seldom taking more than ten minutes to breakfast, and a quarter of an hour to dinner. They tumble their meat precipitately into their mouths, and swallow it almost without mastication. This is contrary to an express law of nature, as may be easily shown.

Food, on being received into the mouth, has two processes to undergo, both very necessary to digestion. It has to be masticated, or chewed down, and also to receive an admixture of saliva. The saliva is a fluid arising from certain glands in and near the mouth, and approaching in character to the gastric juice afterwards to be described. Unless food be well broken down or masticated, and also well mixed up with the salivary fluid, it will be difficult of digestion. The stomach is then called upon to do, besides its own proper duty, that which properly belongs to the teeth and saliva, and it is thus overburdened and embarrassed, often in a very serious manner. The pains of indigestion are the immediate consequence, and more remote injuries follow.

The importance of the saliva has been shown in a striking manner, on several occasions when food was received into the stomach otherwise than through the mouth. A gentleman, who, in consequence of a stricture in the gullet, had his food introduced by an aperture into that tube, used to suffer severely from indigestion. It is recorded of a criminal, who, having cut his throat in prison without fatal consequences, required to get his food introduced by means of a tube inserted by the mouth, that, every time he was fed, there was an effusion of saliva to the amount of from six to eight ounces. We cannot suppose that a fluid of a peculiar character would have been prepared in such quantity, when water would serve as well merely to wet the food, if it had not been designed to act an important part in the business of nutrition. With regard to mastication, the evidence of its importance is still more clear. A few years ago, a young Canadian, named Alexis St. Martin, had a hole made by a shot into his stomach, which healed without becoming closed. It was therefore possible to observe the whole operations of the stomach with the eye. His medical attendant, Dr. Beaumont, by these means ascertained that, when a piece of solid food was introduced, the gastric juice acted merely on its outside. It was only when the food was comminuted, or made *small*, that this fluid could fully perform its function. When the stomach finds itself totally unable to digest a solid piece of food, it either rejects it by vomiting, or passes it on into the gut, where it produces an irritating effect, and is apt to occasion an attack of cholic or flatulency.

It is therefore to be concluded that *a deliberate mastication of our food is conducive to health, and that fast eating is injurious, and sometimes even dangerous.*

The food, having been properly masticated, is, by the action of the tongue, thrown into the gullet. It then descends into the stomach, not so much by its own gravity, as by its being urged along by the contractions and motions of the gullet itself. The stomach may be considered as an expansion of the gullet, and the chief part

of the alimentary canal. It is, in fact, a membranous pouch or bag, very similar in shape to a bagpipe, having two openings, the one by which the food enters, the other that by which it passes out. It is into the greater curvature of the bag that the gullet enters; it is at its lesser that it opens into that adjoining portion of the canal into which the half-digested mass is next propelled.

When food has been introduced, the two orifices close, and that which we may term the second stage in the process of digestion commences. The mass, already saturated with saliva, and so broken down as to expose all its particles to the action of the gastric juice, is now submitted to the action of that fluid, which, during digestion, is freely secreted by the vessels of the stomach. The most remarkable quality of this juice is its solvent power, which is prodigious.

The food exposed to this dissolving agency is converted into a soft, gray, pulpy mass, called chyme, which, by the muscular contraction of the stomach, is urged on into the adjoining part of the alimentary canal, called the duodenum. This is generally completed in the space of from half an hour to two or three hours; the period varying according to the nature and volume of the food taken, and the mastication and insalivation it has undergone.

In the duodenum, the chyme becomes intimately mixed and incorporated with the bile and pancreatic juices; also with a fluid secreted by the mucus follicles of the intestine itself. The bile is a greenish, bitter, and somewhat viscid fluid, secreted by the liver, which occupies a considerable space on the right side of the body immediately under the ribs. From this organ the bile, after a portion of it has passed up into the adjacent gall-bladder, descends through a small duct, about the size of a goose-quill, into the duodenum. The chyme, when mixed with these fluids, undergoes a change in its appearance; it assumes a yellow colour and bitter taste, owing to the predominance of the bile in the mass; but its character varies according to the nature of the food that has been taken. Fatty matters, tendons, cartilages, white of eggs, &c., are not so readily converted into chyme as fibrous or fleshy, cheesy, and glutinous substances. The chyme, having undergone the changes adverted to, is urged by the peristaltic motion of the intestines onwards through the alimentary canal. This curious motion of the intestines is caused by the contraction of the muscular coat which enters into their structure, and one of the principal uses ascribed to the bile is that of stimulating them to this motion. If the peristaltic motion be diminished, owing to a deficiency of bile, then the progress of digestion is retarded, and the body becomes constipated. In such cases, calomel, the blue pill, and other medicines, are administered for the purpose of stimulating the liver to secrete the biliary fluid, that it may quicken by its stimulating properties the peristaltic action. But this is not the only use of the bile: it also assists in separating the nutritious from the non-nutritious portion of the alimentary mass, for the chyme now presents a mixture of a fluid termed *chyle*, which is in reality the nutritious portion eliminated from the food. The chyme thus mixed with chyle arrives in the small intestines; on the walls of which a series of exquisitely delicate vessels ramify in every direction. These vessels absorb or take up the chyle, leaving the rest of the mass to be ejected from the body. The chyle, thus taken up, is carried into little bodies of glands, where it is still further elaborated, acquiring additional nutritious properties; after which, corresponding vessels, emerging from these glands, carry along the fluid to a comparatively large vessel, called the thoracic duct, which ascends in the abdomen along the side of the back-bone, and pours it into that side of the heart to which the blood that has already circulated through the body returns. Here the chyle is intimately mixed with the blood, which fluid is now propelled into the lungs, where it undergoes, from being exposed to the action of the air we breathe, the changes necessary to render it again fit for circulation. It is in the lungs, therefore, that the process of digestion is completed; the blood has now acquired those nutritient properties from which it secretes the new particles of matter adapted to supply the waste of the different textures of the body.

When food is received into the stomach the secretion of the gastric juice immediately commences; and when a full meal has been taken, this secretion generally lasts for about an hour. It is a law of vital action, that when any living organ is called into play, there is immediately an increased flow of blood and nervous energy towards it. The stomach, while secreting the bile, displays this phenomenon, and the consequence is, that the blood and nervous energy are called away from other organs. This is the cause of that chilliness at the extremities which we often feel after eating heartily. So great is the demand which the stomach thus makes upon the rest of the system, that, during and for some time after a meal, we are not in a condition to take strong exercise of any kind. Both body and mind are inactive and languid. They are so, simply because that which supports muscular and mental activity is concentrated for the time upon the organs of digestion. This is an arrangement of nature which a regard to health requires that we should not interfere with. *We should indulge in the muscular and mental repose which is demanded; and this should last for not much less than an hour after every meal.* In that time the secretion of bile is nearly finished: the new nutriment begins to tell upon the general circulation; and we are again fit for active exertion. The consequence of not observing this rule is very hurtful. Strong exercise, or mental application, during or immediately after a meal, diverts the flow of nervous energy and of blood to the stomach, and the process of digestion is necessarily retarded or stopped. Confusion is thus introduced into the system, and a tendency to the terrible calamity of dyspepsia is perhaps established.

For the same reason that repose is required after a meal, it is necessary, in some measure, for a little while before. At the moment when we have concluded a severe muscular task, such, for example, as a long walk, the flow of nervous energy and of circulation is strongly directed to the muscular system. It requires some time to allow this flow to stop and subside; and, till this takes place, it is not proper to bring the stomach into exercise, as the demand it makes when filled would not in that case be answered. Just so if we be engaged in close mental application, the nervous energy and circulation being in that case directed to the brain, it is not right all at once to call another and distant organ into play; some time is required to allow of the energy and circulation being prepared to take the new direction. It may, therefore, be laid down as a maxim, that *a short period of repose, or at least of very light occupation, should be allowed before every meal.*

It is remarkable that these rules, although the natural reasons for them were not, perhaps, well known, have long been followed with regard to animals upon which man sets a value, while as yet their application to the human constitution is thought of only by a few. Those intrusted with horses and dogs will not allow them to feed immediately after exercise; nor will they allow them to be subjected to exercise for some time after feeding. Experience has also instructed veteran soldiers not to dine the instant that a long march has been concluded, but to wait coolly till ample time has been allowed for all the proper preparations.

Although strong mental and muscular exercise should be avoided before, during, and immediately after a meal, there can be no objection to the light and lively chat which generally is indulged in when several are met to eat together. On the contrary, it is believed that

pound conversation is useful towards the process of nutrition. Dr. Combe, in one of his invaluable works, observes as follows:—"The necessary churning, or agitation of the food, is, from the peculiar situation of the stomach, greatly assisted by the play of the diaphragm and abdominal muscles during inspiration and expiration; and the diminution of the vivacity and extent of the respiratory movement which always attends despondency and grief, is one source of the enfeebled digestion which notoriously accompanies depression of mind. The same cause also leads necessarily to an unfavourable condition of the blood itself, which in its turn weakens digestion in common with every other function; but the muscular or mechanical influence is that which at present chiefly concerns us. On the other hand, the active and energetic respiration attendant on cheerfulness and buoyancy of spirits, adds to the power of digestion, both by aiding the motion of the stomach and by imparting to it a more richly constituted blood. If to these causes be added the increase of nervous stimulus which pleasing emotions occasion in the stomach (as in the muscles and organs of secretion generally), we shall have no difficulty in perceiving why digestion goes on so well in parties where there is much jocularity and mirth. 'Laughter,' says Professor Hufeland of Berlin, 'is one of the greatest helps to digestion with which I am acquainted; and the custom prevalent among our forefathers, of exciting it at table by jesters and buffoons, was founded on [accidentally in harmony with] true medical principles. In a word, endeavour to have cheerful and merry companions at your meals: what nourishment one receives amidst mirth and jollity, will certainly produce good and light blood.'"*

KINDS OF FOOD.

It has been shown by a reference to the structure of the human intestinal canal, that our food is designed to be a mixture of animal and vegetable substances. There is, it is to be remarked, a power of adaptation in nature, by which individuals may be enabled for a considerable time to live healthily on one or the other kind exclusively, or nearly so. The above is, nevertheless, the general rule, to which it is safest to adhere. It has been found, for instance, that field-labourers, including ploughmen, will live healthily for many years on a diet chiefly farinaceous—that is, composed of the farina of grain. But it is to be feared that the food, in this case, though apparently sufficient for health, is only so apparently; and that the constitution, being all the time not supported as it ought to be, breaks down prematurely in a great proportion of instances. It has been said, again, that the Irish labouring classes are a remarkably robust race, although their food consists almost exclusively of potatoes. The fact is overlooked, that the Irish eat a quantity of potatoes so enormous as could not fail to make up in some measure for the want of animal diet. It was found by the Poor-Law Commissioners, that the greater number of the peasantry of Ireland, women as well as men, take at their two daily meals, in general, about nine pounds' weight of this food! Such a case is rather to be ranked amongst instances of extraordinary adaptations to a particular kind of food, than as a proof that an unmixed potato diet is healthy. Climate has a remarkable effect in modifying the rule as to a mixture of animal and vegetable food. The former has most of a stimulating quality, and this quality is greater in beef, and flesh in general, than in fowl or fish. Now, the inhabitants of torrid countries are in their ordinary condition least in need of stimulus: hence they find a simple diet of rice and sago sufficient for them. Those, on the contrary, who dwell in cold countries need much stimulus: hence they can devour vast quantities of flesh and blubber, with scarcely any mixture of vegetable food.

Inquiries with respect to the comparative digestibility of different kinds of food, are perhaps chiefly of consequence to those in whom health has already been lost. To the sound and healthy, it is comparatively of little consequence what kind of food is taken, provided that some variation is observed, and no excess committed as to quantity. Within the range of fish, flesh, and fowl, there is ample scope for a safe choice. There is scarcely any of the familiar aliments of these kinds, but, if plainly dressed, will digest in from two to four hours, and prove perfectly healthy. One rule alone has been pretty well ascertained, with respect to animal food, that they are the more digestible the more minute and tender the fibre may be. They contain more nutriment in a given bulk than vegetable matters, and hence their less need for length of intestine to digest them. Yet it is worthy of notice, that between the chyle produced from animal and that from vegetable food, no essential distinction can be observed.

Tendon, suet, and oily matters in general, are considerably less digestible than the ordinary fibre; and these are aliments which should be taken sparingly. Pickling, from its effect in hardening the fibre, diminishes the digestibility of meat. Dressed shellfish, cheese, and some other animal foods, are avoided by many as not sufficiently digestible.

Farinaceous foods of all kinds—wheat, oaten, and barley bread, oaten porridge, sago, arrow-root, tapioca, and potatoes—are highly suitable to the human constitution. They generally require under two hours for digestion, or about half the time of a full mixed meal. The cottage children of Scotland, reared exclusively upon oaten porridge and bread, with potatoes and milk, may be cited as a remarkable example of a class of human beings possessing in an uncommon degree the blessing of health. Green vegetables and fruit, however softened by dressing, are less digestible, and less healthy as a diet. One important consideration here occurs. There is need for a certain bulk in our ordinary food. Receiving nutriment in a condensed form and in a small space will not serve the purpose. This is because the organs of digestion are calculated for receiving our food nearly in the condition in which nature presents it, namely, in a considerable bulk with regard to its nutritious properties. The same law applies with respect to the lower animals. When a horse is fed upon corn alone, it does not thrive. Nature did not contemplate that all horses should readily obtain a corn diet, but looked chiefly to grass and hay for their support. She therefore prepared the organs for the reception of something of considerable volume; and when a food of less volume is persisted in, her law is violated, and fatal consequences ensue. Civilized man is apt to pay little attention to this rule in his own case. Consulting taste alone, he is apt to refine his food overmuch, and reject what it were better for him to take. The present writer is much inclined to doubt the propriety of grinding off the coarse exterior of wheaten grain. It does not seem by any means likely that nature calculated the human alimentary cavity for the use of the white interior of the grain, exclusive of all the rest. Wheat forms so large a part of our daily food, that, if this be the case, we unquestionably make a departure of a very important kind from the laws of health. Experience is favourable to this view, for the effect of coarse bread in relaxing seems only comparable to that of white bread in constipating the bowels.

QUANTITY OF FOOD.—NUMBER AND TIMES OF MEALS

With respect to the amount of food necessary for health, it is difficult to lay down any rule, as different quantities are safe with different individuals, according to their sex, age, activity of life, and some other conditions. There is a general and probably well-founded opinion

* The Physiology of Digestion. By Dr. Andrew Combe. Edinburgh. 1836.

that most persons who have the means eat too much, and thereby injure their health. This may be true, and yet it may not be easy to assign to such persons a limit beyond which they ought not to go.

The best authorities are obliged to refer the matter to our own sensations. Dr. Beaumont, for example, says that we should not eat till the mind has a sense of *satiety*, for appetite may exceed the power of digestion, and generally does so, particularly in invalids; but to a point previous to that, which "may be known by the pleasurable sensations of *perfect satisfaction, ease, and quiescence of body and mind.*"

The number and times of meals are other questions as yet undetermined. As the digestion of a meal rarely requires more than four hours, and the waking part of a day is about sixteen, it seems unavoidable that at least three meals be taken, though it may be proper that one, if not two of these, be comparatively of a light nature. Breakfast, dinner, and tea as a light meal, may be considered as a safe, if not a very accurate, prescription for the daily food of a healthy person. Certainly four good meals a day is too much. No experiments, as far as we are aware, have been made with regard to the total amount of solids which a healthy person in active life may safely take in a day. It has been found, however, that confined criminals and paupers are healthiest when the daily solids are not much either above or below twenty-four ounces.* Of course, in active life there must be need for a larger allowance, but only to a small extent. We may thus arrive at a tolerably clear conviction of the reality of that excess which is said to be generally indulged in; for certainly most grown people who have the means, not excepting many who pursue very sedentary lives, eat *much more* than twenty-four ounces.

The interval between rising and breakfast ought not to be great, and no severe exercise or task-work of any kind should be undergone during this interval. There is a general prepossession to the contrary, arising probably from the feeling of freedom and lightness which most people feel at that period of the day, and which seems to them as indicating a preparedness for exertion. But this feeling, perhaps, only arises from a sense of relief from that oppression of food under which much of the rest of the day is spent. It is quite inconsistent with all we know of the physiology of aliment, to suppose that the body is capable of much exertion when the stomach has been for several hours quite empty. We have known many persons take long walks before breakfast, under an impression that they were doing something extremely favourable to health. Others we have known go through three hours of mental task-work at the same period, believing that they were gaining so much time. But the only observable result was to subtract from the powers of exertion in the middle and latter part of the day. In so far as the practice was contrary to nature, it would likewise of course produce permanent injury. Only a short saunter in the open air, or a very brief application to business or task-work, can be safely indulged in before breakfast.

With regard to the time for either breakfast or dinner, nothing can be said with scientific authority. Dr. Combe, who is by no means disposed to take lax or indulgent views with regard to dietary matters, while favourable to an early dinner hour, allows that he has himself changed his hours for both breakfast and dinner, from comparatively early to comparatively late periods, without any perceptible inconvenience. In rural life, it is found convenient to dine not long after the middle of the day; but in cities, where it is necessary to have a long uninterrupted space in the middle of the day for business, a late dinner-hour is scarcely avoidable. In such a case, a slight lunch serves to keep the strength from sinking; and, if dinner is taken not less than five or six hours before bed-time, it is not easy to see how any injurious consequences should follow. The changes that have taken place in meal hours from old times are more apparent than real. The present substantial lunch of fashionable life occurs nearly at the same hour as the Elizabethan dinner, and the present dinner is in all respects except name the same as the supper of those times. The only thing which the physiologist would much insist on is, that, between the two principal meals of the day, there should be no long fasts. If the interval be above seven hours, a biscuit should be taken after four of the seven hours have elapsed. When the interval amounts to nine hours, the lunch should be a little more substantial, but not of animal food, particularly if any has been taken at breakfast. A glass of wine is often added to a biscuit lunch, or wine alone is taken; but neither of these practices can be commended. While a small quantity of bread or biscuit gives real strength, and is quite sufficient for the occasion, wine only gives a stimulus, serving for the time, but making the case worse afterwards.

VARIETY OF FOOD.

A judicious variation of food is not only useful, but important. There are, it is true, some aliments, such as bread, which cannot be varied, and which no one ever wishes to be so. But apart from one or two articles, a certain variation of rotation is much to be desired, and will prove favourable to health. There is a common prepossession respecting *one dish*, which is more spoken of than acted upon. In reality, there is no virtue in this practice, excepting that, if rigidly adhered to, it makes excess nearly impossible, no one being able to eat to satiety of one kind of food. There would be a benefit from both a daily variation of food and eating of more than one dish at a meal, *if moderation were in both cases to be strictly observed*, for the relish to be thus obtained is useful as promotive of the flow of nervous energy to the stomach, exactly in the same manner as cheerfulness is useful. The policy which would make food in any way unpleasant to the taste, is a most mistaken one; for to eat with languor, or against inclination, or with any degree of disgust, is to lose much of the benefit of eating. On the other hand, to cook dishes highly, and provoke appetite by artificial means, are equally reprehensible. Propriety lies in the mean between the two extremes.

BEVERAGES.

The body containing a vast amount of fluids, which are undergoing a perpetual waste, there is a necessity for an occasional supply of liquor of some kind, as well as of solid food. It remains to be considered what is required in the character or nature of this liquor, to make it serve the end consistently with the preservation of health.

It is scarcely necessary to remark how men in all ages, and almost all climes, have indulged in liquors containing a large infusion of alcohol, or how widespread in our own society is the custom of drinking considerable quantities of wine, spirits, and beer, both at meals and on other occasions. Against habits so inveterate it is apt to appear like fanaticism to make any decided objection; yet the investigator of the laws which regulate health is bound to consider above all things how any particular habit bears upon the human constitution, and to state what is the result of his inquiries, however irreconcilable it may be with popular prejudice.

"The primary effect of all distilled and fermented liquors," says Dr. Combe, "is to *stimulate the nervous*

* See two papers on food, in Nos. 366 and 368 of *Chambers's Edinburgh Journal*.

system and quicken the circulation." They may thus be said to have a larger measure of the effect which animal food has upon the system. It is therefore the less surprising that those tropical nations which live most on farinaceous diet, are also found to be those which have the least propensity to the drinking of ardent spirits; while those northern nations which live most on animal food, have the exactly contrary inclination with respect to liquor, the Scandinavian tribes being notoriously the greatest sots that have ever been known. Dr. Combe admits that, in some conditions of the system, when the natural stimulus is defective, it may be proper to take an artificial supply in the form of ardent and fermented liquors. "There are," he says, "many constitutions so inherently defective in energy, as to derive benefit from a moderate daily allowance of wine; and there are many situations in which even the healthiest derive additional security from its occasional use. If, for example, a healthy person is exposed to unusual and continued exertion in the open air, or to the influence of anxious and depressing watchfulness, a moderate quantity of wine with his food may become the means of warding off actual disease, and enabling him to bear up uninjured, where, without it, he would have given way." But Dr. Combe at the same time declares, in the most decided language, that, when the digestion is good and the system in full vigour, the bodily energy is easily sustained by nutritious food, and "artificial stimulant *only increases the wasting of the natural strength.*" Nearly all physicians, indeed, concur in representing ardent liquors as unfavourable to the health of the healthy, and as being, in their excess, highly injurious. Even the specious defence which has been set up for their use, on the ground that they would not have been given to man if they had not been designed for general use, has been shown to be ill-founded, seeing that *vinous fermentation*, from which they are derived, is not a healthy condition of vegetable matter, but a stage in its progress to decay. Upon the whole, there can be little doubt that these liquors are deleterious in our ordinary healthy condition; and that simple water, toast water, whey, ginger beer, or lemonade, would be preferable (the first being the most natural and the best of all), if we could only consent to deny ourselves further indulgence.

CLEANLINESS.

To keep the body in a cleanly condition is the third important requisite for health. This becomes necessary in consequence of a very important process which is constantly going on near and upon the surface of the body.

The process in question is that of *perspiration*. The matter here concerned is a watery secretion produced by glands near the surface of the body, and sent up through the skin by channels imperceptibly minute and wonderfully numerous. From one to two pounds of this secretion is believed to exude through these channels or *pores* in the course of twenty-four hours, being in fact the chief form taken by what is called the waste of the system, the remainder passing off by the bowels, kidneys, and lungs. To promote the egress of this fluid is of great consequence to health; for when it is suppressed, disease is apt to fall upon some of the other organs concerned in the discharge of waste.

One of the most notable checks which perspiration experiences is that produced by a current of cold air upon the skin, in which case the pores instantly contract and close, and the individual is seized with some ailment either in one of the other organs of waste, whichever is in him the weakest, or in the internal lining of some part of the body, all of which is sympathetic with the condition of the skin. A result of the nature of that last described is usually recognised as a cold or catarrh. We are not at present called on particularly to notice such effects of checked perspiration, but others of a less immediately hurtful or dangerous nature.

The fluid alluded to is composed, besides water, of certain salts and animal matters, which, being solid, do not pass away in vapour, as does the watery part of the compound, but rest on the surface where they have been discharged. There, if not removed by some artificial means, they form a layer of hard stuff, and unavoidably impede the egress of the current perspiration. By cleanliness is merely meant the taking proper means to prevent this or any other matter accumulating on the surface, to the production of certain hurtful consequences.

Ablution or washing is the best means of attaining this end; and accordingly it is well for us to wash or bathe the body very frequently. Many leave by far the greater part of their bodies unwashed, except, perhaps, on rare occasions, thinking it enough if the parts exposed to common view be in decent trim. If the object of cleaning were solely to preserve fair appearances, this might be sufficient; but the great end, it must be clearly seen, is to keep the skin in a fit state for its peculiar and very important functions. Frequent change of the clothing next to the skin is of course a great aid to cleanliness, and may partly be esteemed as a substitute for bathing, seeing that the clothes absorb much of the impurities, and, when changed, may be said to carry these off. But still this will not serve the end nearly so well as frequent ablution of the whole person. Any one will be convinced of this, who goes into a bath, and uses the flesh-brush in cleansing his body. The quantity of scurf and impurity which he will then remove, from even a body which has changes of linen once a day, will surprise him.

Considering the importance of personal cleanliness for health, it becomes a great duty of municipal rulers to afford every encouragement in their power to the establishment of public baths for the middle and working classes, and to extend and protect all existing facilities for washing clothes, as well as for private supplies of water. Baths should neither be very cold nor very warm, but in an agreeable medium; and they should never be taken within three hours of a meal. Nature may be said to make a strong pleading for their more general use, in the remarkably pleasing feeling which is experienced in the skin after ablution.

EXERCISE.

The constitution of external nature shows that man was destined for an active existence, as, without labour, scarcely any of the gifts of providence are to be made available. In perfect harmony with this character of the material world, he has been furnished with a muscular and mental system, constructed on the principle of being fitted for exertion, and requiring exertion for a healthy existence. Formed as he is, it is not possible for him to abstain from exertion without very hurtful consequences

MUSCULAR EXERCISE.

With regard to merely bodily exercise, it is to be observed, in the first place, that we have no fewer than four hundred muscles, each designed to serve some particular end in locomotion or in operating upon external objects. A sound state of body depends very much upon each of these muscles being brought into action in proper circumstances and to a suitable extent. There is even a law operating within a certain range, by which each muscle will gain *in strength and soundness* by being brought into a proper degree of activity.

The process of waste and renovation may be said to be always going on in the body, but it does not go on with permanent steadiness unless the muscular system be exercised. Whenever one of the organs is put into exertion, this process becomes active, and the two opera

tions of which it consists maintain a due proportion to each other. A greater flow of blood and of nervous energy is sent to the organ, and this continues as long as it is kept in activity. When one state of action follows close upon another, the renovating part of the process rather exceeds the waste, and an accretion of new substance, as well as an addition of fresh power, takes place. On the contrary, when an organ is little exercised, the process of renovation goes on languidly, and to a less extent than that of waste, and the parts consequently become flabby, shrunken, and weak. Even the bones are subject to the same laws. If these be duly exercised in their business of administering to motion, the vessels which pervade them are fed more actively with blood, and they increase in dimensions, solidity, and strength. If they be little exercised, the stimulus required for the supply of blood to them becomes insufficient; imperfect nutrition takes place; and the consequences are debility, softness, and unfitness for their office. Bones may be so much softened by inaction, as to become susceptible of being cut by a knife. In a less degree, the same cause will produce languor and bad health.

It is of the utmost importance to observe, that the exercise of any particular limb does little besides improving the strength of that limb; and that, in order to increase our general strength, the whole frame must be brought into exercise. The blacksmith, by wielding his hammer, increases the muscular volume and strength of his right arm only, or, if the rest of his body derives any advantage from his exercise, it is through the general movement which the wielding of the hammer occasions. One whose profession consists in dancing or leaping, for the same reason, chiefly improves the muscles of his legs. The right hands of most persons, by being more frequently employed than the left, become sensibly larger as well as stronger. A still more striking illustration of the principle is to be found in a personal peculiarity which has been remarked in the inhabitants of Paris. Owing to the uneven nature of the pavement of that city, the people are obliged to walk in a tripping manner on the front of their feet; a movement which calls the muscles of the calves of the legs into strong exertion. It is accordingly remarked, that a larger proportion of the people of Paris are distinguished by an uncommon bulk in this part of their persons, than in other cities.

In order, then, to maintain in a sound state the energies which nature has given us, and still more particularly, to increase their amount, *we must exercise them*. If we desire to have a strong limb, we must exercise that limb; if we desire that the whole of our frame should be sound and strong, we must exercise the whole of our frame. It is mainly by these means that health and strength are to be preserved and improved. There are rules, however, for the application of these laws of our being.

1. In order that exercise may be truly advantageous, the parts must be in a state of sufficient health to endure the exertion. A system weakened by disease or long inaction must be exercised very sparingly, and brought on to greater efforts very gradually; otherwise the usual effects of over-exercise will follow. In no case must exercise be carried beyond what the parts are capable of bearing with ease; otherwise a loss of energy, instead of a gain, will be the consequence.

2. Exercise, to be efficacious even in a healthy subject, must be excited, sustained, and directed by that nervous stimulus which gives the muscles the principal part of their strength, and contributes so much to the nutrition of parts in a state of activity. To explain this, it must be mentioned that to produce motion requires the co-operation of the muscular fibre with two sets of nerves, one of which conveys the command of the brain to the muscle, and causes its contraction, while the other conveys back to the brain the peculiar sense of the state of the muscle, by which we judge of the fitness of the degree of contraction which has been produced to accomplish the end desired, and which is obviously an indispensable piece of information to the mind in regulating the movements of the body. The nervous stimulus thus created will enable a muscle in the living frame to bear a weight of a hundred pounds, while, if detached, it would be torn asunder by one of ten. It is what causes men in danger, or in the pursuit of some eagerly desired object, to perform such extraordinary feats of strength and activity. In order, then, to obtain the advantage of this powerful agent, *we must be interested in what we are doing*. A sport that calls up the mental energy, a walk towards a place which we are anxious to reach, or even an exercise which we engage in through a desire of invigorating our health and strength, will prove beneficial, when more of actual motion, performed languidly, may be nearly ineffectual.

3. The waste occasioned by exercise must be duly replaced by food; as, if there be any deficiency in that important requisite, the blood will soon cease to give that invigoration to the parts upon which increased health and strength depend.

KINDS OF BODILY EXERCISE.

Exercise is usually considered as of two kinds—active and passive. The active consists in walking, running, leaping, riding, fencing, rowing, skating, swimming, dancing, and various exercises, such as those with the poles, ropes, &c., prescribed in gymnastic institutions. The passive consists in carriage-riding, sailing, friction, swinging, &c.

Walking is perhaps the readiest mode of taking exercise, and the one most extensively resorted to. If it brought the upper part of the body as thoroughly into exertion as the lower, it would be perfect, for it is gentle and safe with nearly all except the much debilitated. To render it the more effectual in the upper part of the body it were well to walk at all times, when convenient, *singly* and allow the arms and trunk free play. It is best to walk with a companion, or for some definite object, as the flow of nervous energy will be by these means promoted, and the exercise be rendered, as has been already explained, the more serviceable.

Very long or rapid walks should not be attempted by individuals of sedentary habits, nor by weakly persons. Their frames are totally unprepared for such violent exertion. When a person who has been long confined at still employments finds himself at liberty to indulge his inclination for a ramble of a few days in the country, he should begin with slow and short marches, and be content therewith till his body is hardened for greater efforts. This is a rule followed in the army with respect to regiments which are about to undertake long marches. Every summer, many youths, from ignorance, do themselves great injury by undertaking pedestrian excursions much beyond their strength. Jaded to the last degree, and incapable of enjoying any thing presented to their observation, they nevertheless persist in making out some appointed number of miles per day, never once thinking of the outrage they are committing upon themselves, and only looking to the glory of executing their task, the only pleasure they find in the journey. Serious consequences—consumption not unfrequently—follow such ill-advised efforts.

With respect to very rapid walking, Dr. Johnson records some effects from it, of a remarkable nature, as occurring in his own case. "In my own person, says he, "I had some years ago, a very severe and alarming instance of the bad effects of too great muscular action, occasioned by a habit of walking very fast. After a day and night of unusual fatigue and rapid pedestrian exertion together with considerable mental anxiety, I was suddenly seized with an intermission of the pulse at

irregular periods. During each intermission, I felt the heart give a kind of struggle, as it were, and strike with great violence against the ribs, accompanied by a peculiar and most distressing sensation in the cardiac region, which I cannot describe." These symptoms became aggravated and lasted for eight weeks, "during which time," he continues, "I used horse-exercise, and kept, when at home, in a horizontal position. At length the heart gradually lost its morbid irritability; and at the end of fourteen or fifteen weeks I could walk as well as ever."

Running is an exercise which is intermediate between walking and leaping; it consists, in fact, of a series of leaps performed in progression from one foot to another, and the degree of its rapidity bears a constant proportion to the length of the individual and successive leaps. During this exercise the individual is obliged to take long inspirations, and make slow expirations; the air cells of the lungs are thereby distended, and the action of the heart being at the same time increased, and the circulation through the lungs much accelerated, a sense of oppression is felt on the chest, which is often exceedingly painful; when the violent action is discontinued, the heart palpitates with intermitting strokes, in the endeavour to recover its natural equilibrium of motion. Although this and other gymnastic exercises, such as leaping, wrestling, throwing heavy weights, &c., may, when judiciously had recourse to, invigorate the body, yet, from apprehension of the evils and accidents which may be so occasioned, young persons ought not to be permitted to engage extensively in such exercises, except under the care of some one well acquainted with gymnastics.

Fencing is of all active exercises that which is the most commendable, inasmuch as it throws open the chest, and at the same time calls into action the muscles both of the upper and lower extremities. Add to this, that it improves very much the carriage of the body; for which reason it may be considered a branch of polite education. The salutary effects of the other exercises which are taught in gymnastic institutions, such as exercises with the ropes, poles, pulleys, &c., in increasing the strength of the body, will be seen by consulting Mr. Roland's Treatise on Gymnastics, where will be found a table showing the amount of the increasing growth and strength of the body in a given time, during the employment of these exercises.

Dancing is exhilarating and healthful, and seems to be almost the only active exercise which the despotic laws of fashion permit young ladies to enjoy. We can scarcely consider modern quadrilles, elegant though they be, as exercise, seeing that they differ little from the most common walking movement. But country-dances, reels, and hornpipes, are genuine exercise, and their less refinement may be considered as amply compensated by the superior benefit which they confer upon health.

Riding is generally classed among the passive exercises, but in reality it is one which involves much action of the whole frame, and as such is very useful for health. Pursued solitarily, it has the drawback of being somewhat dull; but, when two or three ride in company, a sufficient flow of the nervous energy may be obtained.

The amount of bodily exercise which should be taken must vary according to the habits, strength, and general health of the individual. It was an aphorism of Boerhaave, that every person should take at least two hours' exercise in the day, and this may be regarded as a good general rule.

MENTAL EXERCISE.

Having thus explained the laws and regulations by which exercise may be serviceable to the physical system, we shall proceed to show that the same rules hold good respecting the mental faculties. These, as is generally allowed, however immaterial in one sense, are connected organically with the brain—a portion of the animal system nourished by the same blood, and regulated by the same vital laws, as the muscles, bones, and nerves. As, by disuse, muscle becomes emaciated, bone softens, blood-vessels are obliterated, and nerves lose their natural structure, so, by disuse, does the brain fall out of its proper state, and create misery to its possessor; and as, by over-exertion, the waste of the animal system exceeds the supply, and debility and unsoundness are produced, so, by over-exertion, are the functions of the brain liable to be deranged and destroyed. The processes are physiologically the same, and the effects bear an exact relation to each other. As with the bodily powers, the mental are to be increased in magnitude and energy by a degree of exercise measured with a just regard to their ordinary health and native or habitual energies. Corresponding, moreover, to the influence which the mind has in giving the nervous stimulus so useful in bodily exercise, is the dependence of the mind upon the body for supplies of healthy nutriment. And, in like manner with the bodily functions, each mental faculty is only to be strengthened by the exercise of itself in particular. Every part of our intellectual and moral nature, stands, in this respect, exactly in the same situation with the blacksmith's right arm and the lower limbs of the inhabitants of Paris: each must be exercised for its own sake.

The fatal effects of the disuse of the mental faculties are strikingly observable in persons who have the misfortune to be solitarily confined, many of whom become insane, or at least weak in their intellects. It is also observable in the deaf and blind, among whom from the non-employment of a number of the faculties, weakness of mind and idiocy are more prevalent than among other people. This is indeed a frequent predisposing cause of every form of nervous disease.

The loss of power and health of mind from imperfect or partial exercise of the faculties, is frequently observable in the country clergy, in retired merchants, in annuitants, in the clerks of public offices, and in tradesmen whose professions comprehend a very limited range of objects. There is no class, however, in whom the evil is more widely observable than in those females, who, either from ignorance of the laws of exercise, or from inveterate habit, spend their lives in unbroken seclusion, and in the performance of a limited range of duties. All motive is there wanting. No immediate object of solicitude ever presents itself. Fixing their thoughts entirely on themselves, and constantly brooding over a few narrow and trivial ideas, they at length approach a state little removed from insanity, or are only saved from that, perhaps, by the false and deluding relief afforded by stimulating liquors. In general, the education of such persons has given them only a few *accomplishments*, calculated to afford employment to one or two of the minor powers of the mind, while all that could have engaged the reflecting powers has been omitted. Education, if properly conducted, would go far to prevent the evils which befall this unfortunate part of the community.

On the other hand, excessive exercise of the brain, by propelling too much blood to it, and unduly distending the vessels, is equally injurious with its disuse. And not only are fatal effects to be apprehended from undue mental task-work, but also from that constant *stretch* of the mind which attends an unduly anxious and watchful disposition. The ancients had some notion of the impropriety of an incessant exertion of the mind, and rebuked it by their well-known proverb—*Apollo does not keep his bow always bent*. But they had comparatively little experience of the oppressive mental labours endured by large portions of modern society. Irrational, and in some respects dangerous, as many of the habits of our ancestors were, it is questionable if they suffered so much from these causes as their successors do from

virtuous but overtasking exertion. To maintain what such man conceives to be a creditable existence, now requires such close and vigorous exertions, that more, we verily believe, perish in the performence of duties in themselves laudable, than formerly sank under fox-hunting, toast-drinking, and the gout.

It is in large cities that this unintentional kind of self-destruction is most conspicuously exemplified. And it is in London, above all other places, that the frenzy is to be observed in its most glaring forms. To spend nine hours at a time in business, without food or relaxation, is not only not uncommon, but an almost universal practice, among the citizens of London: from a breakfast at eight to a chop at five, they are never, to use an expressive phrase, *off the stretch*. Upon a stomach enfeebled by exhaustion, they then lay the load of a full meal, which perfect leisure would hardly enable them to digest. But, far from waiting to digest it, they have no sooner laid down knife and fork, than away they must once more rush to business—not perhaps willingly, for nature tells them that it would be agreeable to rest; but then—but then business *must* be attended to. If nature were to punish the daily transgression by the nightly suffering, we should find few who, for the sake of pecuniary gain, would thus expose themselves to misery. But, unfortunately, she runs long accounts with her children, and, like a cheating attorney, seldom renders her bill till the whole subject of litigation has been eaten up. Paralysis at fifty comes like the mesne process upon the victim of commercial enthusiasm,* and either hurries him off to that prison from which there is no liberation, or leaves him for a few years organically alive to *enjoy* the fruits of his labours. A life thus spent is a mere fragment of what it ought to be. The means of obtaining pleasure have swallowed up the end. The glorious face of nature, with all its sublime and beautiful alternations; the delights of social life; the pleasures arising from the exercise of the finer feelings and the cultivation of the intellect; all that higher class of gratifications which nature has designed a moderate labour to place within the reach of *all* her creatures have been lost to such a man.

The absurdity of an ignorance or weakness of this kind is perhaps still more striking, when it occurs in individuals who make the acquisition of knowledge the chief aim of life. As the world is at present situated, it is possible to acquire learning upon almost every subject, and an infinite amount of knowledge, useful and otherwise, without even by chance lighting upon a knowledge of the most indispensable observances necessary for the preservation of a sound mind in a sound body. Half of the multiform languages of Asia may be mastered, while the prodigy who boasts so much learning knows not that to sit a whole day within doors at close study is detrimental to health; or, if he knows so much, deliberately prefers the course which leads to ruin. Leyden, an enthusiast of this order, was ill with a fever and liver complaint at Mysore, and yet continued to study ten hours a day. He eventually sank, in his thirty-sixth year, under the consequences of spending some time in an ill-ventilated library, which a slight acquaintance with one of the most familiar of the sciences would have warned him against entering. Alexander Nicoll, a recent professor of Hebrew at Oxford, of whom it was said that he might have walked to the wall of China without the aid of an interpreter, died at the same age, partly through the effects of that intense study which so effectually but so uselessly had gained him distinction. Dr. Alexander Murray, a similar prodigy, died in his thirty-eighth year, of over-severe study; making the third of a set of men remarkable for the same wonderful attainments, and natives of the same country, who, within the space of twenty years, fell victims to their ignorance of the laws of mental exercise. In 1807, Sir Humphry Davy prosecuted his inquiry into the alkaline metals with such inordinate eagerness, that, through excitement and fatigue, he contracted a dangerous fever, which he, in ignorance of the human physiology, ascribed to contagion caught in experimenting on the fumigation of hospitals. His physician was at no loss to trace it to his habits of study, which were such as would have soon worn out a frame much more robust. Davy at this time spent all the earlier part of the day in his laboratory, surrounded by persons of every rank, whose admiration of his experiments added to his excitement. Individuals of the highest distinction "contended for the honour of his company to dinner, and he did not possess sufficient resolution to resist the gratification thus afforded, though it generally happened that his pursuits in the laboratory were not suspended until the appointed dinner hour had passed. On his return in the evening, he resumed his chemical labours, and commonly continued them till three or four in the morning, and yet the servants of the establishment not unfrequently found that he had risen before them."* Over-tasked nature at length yielded under his exertions, and it was with the greatest difficulty that he was restored to health. Excessive application is known to have in like manner thrown Boerhaave into a species of delirium for six weeks, and to have on one occasion given a severe shock to the health of Newton. It unquestionably cut short the days of Sir Walter Scott, and also of the celebrated Weber, whose mournful exclamation in the midst of his numerous engagements can never be forgotten:—"Would that I were a tailor, for then I should have a Sunday's holiday!"

The premature extinction of early prodigies of genius is generally traceable to the same cause. We read that, while all other children played, they remained at home to study; and then we learn that they perished in the bud, and balked the hopes of all their admiring friends. The ignorant wonder is of course always the greater, when life is broken short in the midst of honourable undertakings. We wonder at the inscrutable decrees which permit the idle and the dissolute to live, and remove the ardent benefactor of his kind, the hope of parents, the virtuous and the self-devoted; never reflecting that the highest moral and intellectual qualities avail nothing in repairing or warding off a decided injury to the physical system, which is regulated by different laws. The conduct of the Portuguese sailors in a storm, when, instead of working the vessel properly, they employ themselves in paying vows to their saints, is just as rational as most of the notions which prevail on this subject in the most enlightened circles of British society.

It ought to be universally known, that the uses of our intellectual nature are not to be properly realized without a just regard to the laws of that perishable frame with which it is connected; that, in cultivating the mind, we must neither overtask nor undertask the body, neither push it to too great a speed, nor leave it neglected; and that, notwithstanding this intimate connection and mutual dependence, the highest merits on the part of the mind will not compensate for muscles mistreated, or soothe a nervous system which severe study has tortured into insanity. To come to detail, it ought to be impressed on all, that to spend more than a moderate number of hours in mental exercise diminishes insensibly the powers of future application, and tends to abbreviate life; that no mental exercise should be attempted immediately after meals, as the processes of thought and of digestion cannot be safely prosecuted together; and that, without a due share of exercise to the whole of the

* Of the frequent occurrence of premature paralysis, in consequence of the mode of life above described, we are assured by a metropolitan physician of the greatest eminence.

* Paris's Life of Sir Humphry Davy, p. 183.

mental faculties, there can be no soundness in any, while the whole corporeal system will give way beneath a severe pressure upon any one in particular. These are truths completely established with physiologists, and upon which it is undeniable that a great portion of human happiness depends.

REPOSE A CONDITION DEMANDED BY EXERCISE.

Exercise demands occasional periods of repose, and, in particular, that a certain part of every twenty-four hours be spent in sleep. After having been engaged in daily occupations for fourteen or sixteen hours, a general feeling of fatigue and weakness is induced; the motions of the body become difficult, the senses confused, the power of volition or *will* suspended, and the rest of the mental faculties, becoming more and more inactive, sink at length into a state of unconsciousness. The sense of sight first ceases to act by the closing of the eyelids; then the senses of taste and smell become dormant; and then those of hearing and touch. The muscles, also, dispose themselves with a certain reference to ease of position, those of the limbs having grown indolent before those that support the head, and those that support the head before those of the trunk. In proportion as these phenomena proceed, the respiration becomes slower and more deep, the circulation diminishes in impetus, the blood proceeds in great quantity towards the head, and all the functions of the internal organs become retarded. In this state, shut out, as it were, from the external world, the mind still retains its wonted activity, deprived, however, of the guidance of judgment and the power of *distinct* recollection; in consequence of which, it does not perceive the monstrous incongruities of the imagery which sweeps before it, and takes but faint cognisance of the time which elapses.

It may be laid down as an axiom, that the more uninterrupted sleep is, the more refreshing and salutary will be its effects; for, during this period, the body undoubtedly acquires an accession of nervous energy, which restlessness, however induced, must disturb; and therefore the state of the body before going to sleep, the kind of bed, and the manner of clothing, require especial attention. As the functions of the body are performed more slowly during our sleeping than our waking hours, a full meal or supper, taken immediately before going to bed, imposes a load on the stomach which it is not in a condition to digest, and the unpleasant consequence of oppressive and harassing dreams is almost certain to ensue. When the sleeper lies upon his back, the heart pressing, while pulsating, on the lungs, gives rise to a sense of intolerable oppression on the chest, which seems to bear down upon the whole body, so that in this painful state not a muscle will obey the impulse of the will, and every effort to move appears to be altogether unavailing. This constitutes *incubus* or *nightmare;* and it may be observed, that, as acidity on the stomach, or indigestion, gives rise to such dreams, so all dreams of this disturbed character are converse indications of indigestion; for which reason the great physiologist Haller considered dreaming to be a symptom of disease. It is certain that the dreams of healthy persons are the lightest and most evanescent.

The kind of bed on which we repose requires attention. Some are advocates for soft, others for hard beds; hence some accustom themselves to feather-beds, others to mattresses. The only difference between a soft and a hard bed is this—that the weight of the body in a soft bed presses on a larger surface than on a hard bed, and thereby a greater degree of comfort is enjoyed. Parents err in fancying that a very hard bed contributes to harden the constitution of their children; for which reason they lay them down on mattresses, or beds with boarded bottoms. A bed for young children cannot be too soft, provided the child does not sink into it in such a manner that the surrounding parts of the bed bend over and cover the body. The too great hardness of beds, says Dr. Darwin, frequently proves injurious to the shape of infants, by causing them to rest on too few parts at a time; it also causes their sleep to be uneasy and unrefreshing. The universal analogy derived from other animals evinces the truth of this doctrine, both in respect to the softness and due degree of warmth of their beds. Birds line the nests of their young with feathers; the eider duck and the rabbit pluck the down from their own breasts to increase the softness of the beds of their tender offspring, and brood over them with their wings, or clasp them to their bosoms, for the sake of warmth. For this reason, it is better that weak children should sleep with a bedfellow than alone; for, in this case, if any part of the body becomes cold, the child instinctively places that part in contact with the warmer body of its companion. So, also, it is better for a new-born infant to sleep with its mother in winter, or with its nurse, than in a solitary crib by the bedside. When in bed, the head should be always higher than the feet, and those subject to palpitation of the heart should lie with their heads very high. Night clothes should never consist of more than a chemise or shirt of cotton or linen, with a flannel shirt beneath. It is also highly improper to sleep in a bed overloaded with clothes; the body is thereby heated, and feverishness and restlessness induced. Accordingly, persons who complain of sleeplessness should look to the quantity of their bed-clothing; for the unnecessary addition of a single blanket may be the sole cause of the annoyance. It is also imprudent to lie with the head entirely within the bed-clothes; for, in this case the same air which has been already breathed must be again and again inhaled. For the same reason, the curtains should not be drawn closely round the bed. Washing the face and hands, and brushing the teeth, before going to bed, will be found to contribute materially to comfort. Whatever be the time chosen for sleep, it is evident that no person can with impunity convert day into night. Eight o'clock for children, and eleven for adults, may be recommended as good hours for retiring to rest. It is well known that children require more sleep than adults; and more sleep is requisite in winter than in summer. The average duration of sleep which may be recommended for adults is *eight* hours; but much depends upon habit, and many persons require only six. It is scarcely necessary to observe, that, on rising in the morning, the strictest attention should be paid to washing the face, neck, and hands; the mouth and teeth should also be well cleansed. The most simple powder for the teeth is finely brayed charcoal, a little of which will clear away all impurities, and preserve the teeth. On leaving the bedroom, the windows should be opened, and the clothes of the bed turned down, in order that the exhalations of the body during sleep may be dissipated. If, instead of this, the bed be made immediately after we have risen, these exhalations are again folded up with the clothes—a practice which is not consonant either with cleanliness or health.

TEMPERATURE.

The fifth important requisite for health is that the body be kept in a temperature suitable to it.

The degree of heat indicated by sixty degrees of Fahrenheit's thermometer, or that of a temperate summer day, is what the human body finds it agreeable to be exposed to when in a state of inactivity. In air much colder, the body experiences an unpleasant sensation, unless some warm clothing be worn, or a pretty active exercise be indulged in. When, either by natural or artificial means, the body is kept in a suitable state of warmth, the functions of the circulation and perspiration in the skin go on healthily; it is red, in consequence of the blood being urged into the capillaries or minute ves-

cels near the surface; it is also soft and moist, from the action of the glands for secreting the waste fluid and its free egress through the pores. This is a condition of great comfort, and the appearance of those who enjoy it conveys to others the notion that they are in good health. When, on the contrary, there is a much lower temperature, the functions of the vessels connected with the skin are apt to be considerably deranged. The vessels, in these circumstances, contract; the blood is driven inwards, where it sometimes occasions diseases of a dangerous nature; the perspiration, also, being prevented from passing out by its usual channels, catarrhal complaints ensues, sometimes ending in consumption.

It is of the more importance to make these facts generally known, as a notion prevails that exposure to a painful degree of cold tends to induce hardiness of constitution and to promote health. Undoubtedly, there may be harm from an opposite extreme, and we know well that excessive clothing and living in overheated apartments are detrimental to health. But safety lies in a medium between the two extremes. There is a degree of warmth which is both agreeable and healthy, and which it is desirable to have around us as constantly as possible.

There is no period of life at which warmth is of more consequence than in infancy. In a very young babe, the circulation is almost altogether confined to the surface, the internal organs being as yet in a very weak state. In such circumstances, to plunge the child into cold water, from an idea of making it hardy, as is customary in some countries, and among ignorant persons in our own, is the height of cruelty and folly; for the unavoidable consequence is, that the blood is thrown in upon the internal organs, and inflammation, bowel-complaints, croup, or convulsions, are very apt to ensue. A baby requires to be kept at a temperature above what is suitable to a grown person; it should be warmly, but not heavily clothed; the room where it is kept should be maintained at a good, but not oppressive heat; and it should never be put into other than tepid water. It should not be exposed to the open air for some days after its birth.

At all periods of life, it is most desirable to avoid exposure to very low temperatures, especially for any considerable length of time. To sit long in cold school-rooms or work-rooms, with the whole body, and especially the feet, in a chilled condition, is very unfavourable to the health of young people. It is not possible that a condition so adverse to the healthy action of the cutaneous vessels should not lead, if long persisted in, to very bad consequences. Those who are compelled to be sedentary, should make it their endeavour to obtain a sufficiently high temperature, either by warming their apartments sufficiently, or thickening their clothing. Common fires, though delightful from their cheerful look, are confessedly very inadequate, in most circumstances, to heat large work-rooms, school-rooms, or even the larger class of sitting-rooms; not to speak of the great objection which has been made to them on the score of economy, three-fourths of their heat being sent off through the chimney. It is most desirable that some means in which the public could have confidence were devised for thoroughly, and at the same time healthily, warming large apartments. Stoves enclosed in large iron-plate cases (Arnott's stoves), pipes of hot water or of steam, and blasts of heated air, are among the most conspicuous plans tried within the last few years. But none of these plans seems to have succeeded in obtaining the hearty approbation of the public, chiefly, we suspect, from their not being accompanied by what is peculiarly necessary where they are in operation, a means of ventilation. We can speak from some experience in favour of the plan of large steam-tubes, accompanied by a ventilating process; and have very little doubt that, with the latter requisite, this and several other of the recently suggested modes of heating might be found to serve the desired end. It is certainly of great consequence that some plan should be generally consented upon for warming the large rooms in which scholars and work-people spend so much time, as the chilliness there so generally experienced is a fatal underminer of the human constitution.

Clothing should be in proportion to the temperature of the climate and the season of the year; and where there are such abrupt transitions from heat to cold as in our country, it is not safe ever to go very thinly clad, as we may in that case be exposed to a sudden chill before we can effect the proper change of dress. Very fatal effects often result to ladies from incautiously stepping out of heated rooms in the imperfect clothing which they ludicrously style *full-dress*: all such injuries might be avoided by putting on a sufficiency of shawls, and allowing themselves a little time in the lobby to cool. The under-clothing in this country should be invariably of flannel, which is remarkably well calculated to preserve uniformity of temperature, as well as to produce a healthy irritation in the skin. While the value of comfortable clothing is fully acknowledged, we should never lose sight of the value of exercise for keeping up a kindly glow upon the surface, and for the support of a high tone of general health. Any one who, neglecting this, should live constantly in a warmed apartment, or only go out of doors muffled up in a load of clothes, would speedily suffer from a relaxed state of the system, and become so susceptible of damage from the slightest change of temperature in the atmosphere, that the most dangerous consequences might be apprehended.

Wet clothes applied to any part of the body, when it is in an inactive state, have an instantaneous effect in reducing the temperature, this being an unavoidable effect of the process of evaporation which then takes place. Hence it is extremely dangerous to sit upon damp ground, or to remain at rest for a single minute with wetted feet, or any other part of the body invested in damp garments. Dampness in the house in which we live has the same effect, and is equally dangerous. The chill produced by the evaporation from the wetted surface, checks the perspiration, and sends the blood inwards to the vital parts, where it tends to produce inflammatory disease. Few persons seem to be aware of these truths. We find young men heedlessly getting their feet wet, and sitting with them in that condition, thereby incurring the most deadly peril. Young women commit a similar folly, when they walk out in thin shoes in a wet or cold day. Exposure to wet, damp, or cold, is of comparatively little moment when the body, by a course of exercise or training, has been prepared to endure these conditions. Thus, a person brought up delicately, or much within doors, would be killed by that which would have little or no effect on a ploughman. It is therefore worthy of being suggested as a line of policy, that no one should accustom himself or herself to a pampered or too delicate mode of life. Every one should, if possible, go out daily, both in good and bad weather, with clothing corresponding to the nature of the weather, and in this way strengthen and harden the constitution to endure all ordinary and reasonable exposure. It is important, however, to note, that even the hardiest persons are never safe from the effects of wet clothes and other modes of exposure to a reduced temperature. No complaint is more common among out-of-door labourers, and also poor people in damp lodgings, than rheumatism. This is an affection produced solely by a violation of the natural law which demands that the body should not be chilled. Rheumatism is produced alike from exposure to a shower or to a draught of cold air when the body is warm, and from sitting with the feet on a cold stone or clay floor; the only difference, perhaps, being that the rheumatism

is in one case in the shoulders and in the other in the legs. Let us therefore impress on all the propriety of avoiding chills, the effects of which may be more fatal than a simple attack of rheumatism. When rheumatism has been contracted, the best remedy for its expulsion, if adopted in time, is friction of the part; if well rubbed before a fire with flour of mustard, so as to cause a counter-irritation on the surface, the internal complaint may be expelled.

ERRORS IN DRESS.

This is perhaps the most appropriate place in which to introduce some remarks upon errors in dress. The integuments which nature calls upon us to put on for the sake of warmth, are too often made the means of inflicting serious injury, either through ignorance or caprice. It is therefore necessary, in a treatise on the preservation of health, to advert in emphatic terms to this subject.

It is scarcely too much to say, that there is no part of the human frame, from the sole of the foot to the crown of the head, which has not been, and is not at this moment, mistreated by fashion. We laugh at the Chinese ladies, who have their feet constrained by iron moulds into mere bulbous appendages to the limbs; but we never reflect that, among ourselves, errors only inferior in degree are constantly committed. The foot naturally spreads out, fan-like, from the heel to the toes. But, instead of having our shoes formed in the same triangular shape, they are made in a lozenge form, truncated at the front, the toes being thus perverted from their radiating arrangement into one exactly the opposite; so that they become crushed under one another, and deprived of a great part of that muscular power by which they were designed to propel our bodies in walking. In the greater height usually given to the heels of shoes, another important deviation from nature is committed. When the heel is raised above the level of the ball of the foot, a complete derangement takes place in the muscles of locomotion; the power of the limb is impaired; and the whole body is thrown off its equipoise. It is impossible in such circumstances to exercise the body as it ought to be. The foot is also forced or plugged down into the narrow front of the shoe, where the toes become liable to the grievance of corns. Thus the free healthy play of the various parts of the body is further diminished. From the uneasiness and constraint experienced in the feet, sympathetic affections of a dangerous kind often assail the stomach and chest; as hemorrhage, apoplexy, and consumption. Low-heeled shoes, with a sufficiency of room for the toes, would completely prevent all such consequences.

An improved taste in the male sex has long since abolished the coarse and self-annoying absurdity of leathern small-clothes; but it is still too common to impede the circulation and the play of the muscles by tight apparel, especially in the regions of the stomach and neck. The immediate effect of these injudicious appliances is such inconvenience: the remote result is a diminution of the general strength and health. But all the errors of the male sex sink into insignificance, when compared with one to which the fair are liable. In the construction of the human chest, nature has provided ample room for several important viscera, the functions of which cannot be in any degree disturbed without a wrong being inflicted upon the whole system. Here reside the heart, the lungs, the liver, and the stomach. Fine ladies may affect to shut their mind's eye to the existence of such things; but the daintiest of their emotions depend upon the right state of those very viscera, without which they could no more think, speak, and act, than they could cast languishing looks without eyes, or melt our hearts by witching minstrelsy without a tongue and fingers. In the natural state, the external figure at this place tapers gently downwards. The waist of the Venus de Medici is of that form, and its perfect elegance was never challenged. But the women of the ordinary world have set up for themselves a different standard of beauty. A fine waist, in their estimation, is one which tapers rapidly below the arms, and is not above two-thirds of the natural girth. It must also be strictly round, although the waist of nature verges upon the oval. In order to reduce themselves to the desired shape and space, almost all the unmarried, and not a few of those who are otherwise, brace themselves in a greater or less degree with corsets, which no doubt produce the requisite roundness and slenderness, but at the expense of all the internal organs upon which health depends. The false ribs are pressed inwards; the respiratory and circulatory systems are crushed and thrust out of their proper place; the alimentary system is deranged; and even upon the exterior of the person, deformities of the most glaring kind, such as hooped shoulders and curved spines, are produced. Custom to a certain extent enables the victim to endure the inconvenience; there are even some who feel so little trouble from it, as to deny that any harm ensues from tight-lacing. But a violation so great cannot be otherwise than mischievous. We have seen a young lady's sash which measured exactly twenty-two inches, showing that the chest to which it was applied had been reduced to a diameter (allowing for clothes) of little more than seven inches. All who are aware of the internal organs at that part, know very well that it is impossible for them to exist in their natural condition within so small a space. Bruised, impeded, and disordered, they must of course be, and accordingly cannot fail to become a source of dreadful suffering to the wretched being who outrages them. Palpitations, flushings, dyspepsia, determination of blood to the head, and consumption, are among the evils which physicians enumerate as flowing from this sacrifice to vanity. Another of a moral kind is acknowledged to be of by no means unfrequent occurrence: in order to soothe the painful sensations produced by the constraint, spirituous liquors and cordials are resorted to, and thus habits of the most degrading nature are formed. Another evil still, respecting which a hint may be sufficient, is the unfitting of the system for the duties of a mother. How many domestic afflictions, which are submitted to in a spirit of resignation, as the unavoidable decrees of Providence; how many of the saddest scenes which this world ever presents—gentle and tender girls pining away under the eyes of heartless parents—beloved wives torn from the arms of husbands and children at the very moment when prolonged life was most needful—must be owing to a cause too trivial and unworthy to be mentioned in the same sentence with its so dire effects! No doubt it is well to submit meekly to such afflictions; but while they are ascribed in all humility to a Providence which is upon the whole only another term for Mercy and Justice, let us not be blind to the fact that they accrue through violations committed by ourselves upon laws established by Providence for our happiness, and might have been avoided by a different course of conduct.

The fashion of tight-lacing obviously owes its origin to a desire on the part of the ladies to attract admiration. It is of little importance to point out that they are quite wrong in their calculations as to the effect; but we would press upon the guilty parties, and all interested in their welfare, that tight-lacing is a practice which cannot be long persisted in without the most disastrous consequences. It is painful to reflect, that parents, so far from discouraging the practice, are so ignorant as often to force it upon their children. We have heard of a young lady whose mother stood over her every morning, with the engine of torture in her hand, and, notwithstanding many remonstrative tears, obliged her to submit to be laced so tightly as almost to stop the power of breathing

The result is, that the unfortunate victim is now severely afflicted with asthma, and has fallen into a state of low health As a general rule, it cannot be too strongly impressed upon those who have the care of young persons, that all clothing should sit lightly upon the figure, so as to allow of the full play of every part of the system.

INNOCENT ENJOYMENTS.

A sufficiency of innocent enjoyments has been set down as the sixth requisite towards the preservation of health. It may seem almost superfluous to treat this part of the subject, since the disposition to take amusement is one by no means generally wanting. A regard, however, for the completeness of our little treatise enforces us to make a few remarks on it; and we are not satisfied that there is not a considerable number of persons to whom an injunction to take innocent enjoyments is needful. There may be a general advantage in seeing the matter placed on something like a philosophical basis.

No physiological doctrine seems more entitled to faith and regard, than that a harmonious exercise, in moderation, of all parts of the system, including the organs of the mental faculties, is necessary for health. It is proved by the very craving which we experience, after a long task, or a long perseverance in some particular habits, for something which will engage a different set of faculties. There is nothing which will pleasingly engage our thoughts for any considerable length of time. Something inferior will invariably be preferred, if it only be new. Now, the duties by which men in general earn their subsistence, are in all cases of such a nature as only to call into exercise a part of their mental and bodily system. Something is required, at once to soothe and compensate us for the drudgery of our current labours, and to bring into exercise those parts of our muscular frame and intellect, which professional duty has left unoccupied. To begin with an humble illustration: how delightful to a tailor, after long exercising his fingers and arms alone at his business, to enter into some athletic sport upon the village green, by which his limbs also will be exercised! After a lawyer has fagged for a day at a brief, how delightful to be able, by the reading of a new novel or play, to call up another set of the intellectual powers! In these changes from grave to light occupation, there is at once repose given to the tasked faculty, and the gratification of employment given to others which have been pining for want of something to do. It so happens that, from the sentient nerves being mixed with those which direct the operations of all our organs, each organ has a sense of enjoyment in being rightly exercised. Even the stomach has, from this cause, a gratification when its functions are going on well, and this altogether independent of any pleasure we may have had in eating the meal upon which it is now employed. An organ left long unoccupied is thus somewhat like a child in a family which its parents have been overlooking. It craves to be noticed like the rest, and, when the desired notice at length comes, it experiences a high degree of satisfaction. In short, variation of occupation and pursuit, for the purpose of keeping all the parts of the system in harmonious exercise and in healthy tone, is one of the most important principles concerned in the preservation of health.

There are several powers of the mind which must have been designed for the express purpose of creating and receiving amusement, and the existence of which, therefore, shows that amusement has a place in the right economy of human life. The imitative arts in general, music, fiction, drollery of all kinds, spring directly from primitive faculties of the mind; and, when we see the pleasure they give in society, we cannot doubt that they are things naturally required by man, and in which it is quite legitimate for him to indulge within moderate bounds and in circumstances compatible with innocence. These things are doubtless designed to alleviate the burdens of life and beguile us of its cares. They furnish something like a different sphere of existence, into which we may enter and temporarily lose the sense of all that harasses us in the ordinary one. The *joculator*—under which name our ancestors associated the poet, tale-teller, and mimic, and which we may apply equally extensively to the poet, novelist, artist, and player—is therefore a most useful functionary in society. We say nothing on the present occasion of the refinement to be derived, in addition, from communion with the productions of the higher classes of such minds.

Amongst amusements, *reading* takes a most distinguished place, for there is none which may be more readily or more innocently indulged in, and fortunately, in our own country, it is one which may now be enjoyed by all. It is unquestionably the chief of in-door amusements; and few scenes are calculated to awaken more agreeable feelings in a well-constituted mind, than a family group assembled in their parlour, to hear some one of their number reading a pleasant book. Ever honoured be the great masters of fiction, who have allowed us, by these means, to pass from common life, for a time, into "the tale of Troy divine," the story of "the gentle lady married to the Moor," the tear-compelling fate of Ravenswood, and all the other numberless suppositions of things done, and persons who spoke and acted, which we feel to be more real than much of even the life that is passing around us!

Next to reading stands *music*, a means of enjoyment of which only a few comparatively, in our country, take advantage, but which might easily be made much more extensively available, and probably will be so in the course of a few years. Connected intimately with music is *dawing*, which is not only a cheerful amusement, but a positive and direct means of bodily exercise. A family musical or dancing scene, like a family reading scene, is a thing beautiful to look upon. There is a prejudice against both in some minds, on account of their being liable to abuse; but the abuses of both arise very much from their not being extensively or freely indulged in. Were music the general accomplishment which it might easily be made, it would not only be indulged in on all occasions with simplicity and innocence, but it would supplant coarser and more clandestine amusements. Dancing is the nightly amusement of the French peasantry, and it has never been pretended that these people are less virtuous than the corresponding class in our own country. *Theatrical representations* it might be more difficult to place on such a footing as to secure the unhesitating approbation of the good; but certainly, if this were done, they might prove highly serviceable in furnishing amusement.

In the class of amusements we must reckon meetings or promenades in ornamental grounds, excursions into the country, and little tours, all of which are highly commendable in those who are able to indulge in them. The entertainment of little parties of friends, and the going out to entertainments given by them in return, are other means of amusement common in society, and which may be moderately indulged in with much advantage. In short, whatever gives a pleasant variation to the monotony of life, without leading the mind away from duty or corrupting the manners, ought to be indulged in as freely as circumstances will permit. The mind returns from such diversions with renewed tone and power, and neither the time nor the expense is lost in the long run. It is the more necessary to impress these maxims, as many well-meaning persons, alarmed perhaps at the occasional abuses of such enjoyments, repudiate them nearly altogether, and thereby lower the tone of their health, both as respects the body and the mind. It is particularly distressing to see such persons exercising a control over the young, and denying to their unfortunate protegés an

element of life not much less pressingly necessary than the air they breathe.

Dr. Southwood Smith, in his excellent work "The Philosophy of Health," has pointed out that pleasure is the ordinary, and pain in all cases an extraordinary, result of the action of our organs. "There are," he says, "many cases in which pleasure is manifestly given for its own sake; but in no case is the excitement of pain gratuitous." Pain is always a punishment; and, when it reaches a certain extreme, it is destructive of what feels it. But "all such action of the organs as is productive of pleasure is conducive to the perpetuation of life. There is a close connection between happiness and longevity. Enjoyment is not only the end of life, but it is the only condition of life which is compatible with a protracted term of existence. The happier a human being is, the longer he lives; the more he suffers, the sooner he dies: to add to enjoyment is to lengthen life; to inflict pain is to shorten the duration of existence." It may fairly be presumed, then, that a certain amount of enjoyment in life is necessary for health, and that when the quantity actually secured is much below that point, unhealthy conditions must ensue. If, for example, poverty or embarrassed circumstances press so severely upon a cautious and conscientious man, as to leave him scarcely a moment's comfort from one year to another, he cannot fail to sink in health. If married to a female of bad temper, or who afflicts him by bad habits, and if, from these causes, he rarely enjoys a moment of happiness, so also must his health fail. In short, to be placed in any such circumstances as constitute a bar against nearly all enjoyments, must prove injurious, and tend to the shortening of life.

Enjoyments are of many kinds. Some are sensual, as the taking of agreeable food; others are intellectual, as agreeable music, reading, &c.; others are moral, as the exercise of philanthropy, the religious feelings, &c.; and some are sympathetic, and consist in the exercise of the affections and the reflection of that gratification which we have endeavoured to impart to others. We may consider as such all things over and above the plainest unrelished fare, and the supply of water, air, and a barely sufficient temperature. These are usually considered as strictly the *necessaries* of life, the others being the comforts or luxuries. The distinction is not quite correct. The first class are certainly immediately necessary to the support of life; that is to say, they are hourly, daily necessary. But more or less of what are called the comforts of life are also necessary, if we would preserve health. The only difference is, that the want of them would not tell in so short a time as the want of the so-called necessaries. If a human being be shut up in a cell, and allowed only a sufficiency of unrelished and unvaried food, with air and water, the want of all the enjoyments of life, sensual, intellectual, moral, and sympathetic, will in a certain time make him utterly miserable; the health of body and mind will give way; and if the experiment be sufficiently protracted, he will perish. The ignorance which prevails on this point has led to the trial of what is called the *silent system* in prisons, which is now about to be abandoned as utterly irreconcilable with humanity. It were well if more knowledge prevailed on the subject, for, from erroneous ideas of what is *necessary* for healthy life, many deprive themselves or others of things which, when we take the element of time into account, are as essential to health as the supply of the air we breathe. There is, in some enthusiastic minds, a spirit of asceticism and self-mortification which would give up all the enjoyments of life together. Such persons rarely fail to reduce their own health, if they do not also exercise some unhappy control to the same effect over their fellow-creatures. While self-denial for moral purposes is always admirable, and over-indulgence of every kind saps the vigour and fortitude of the human character, it should be ever kept in view that there is great danger in reducing the allowance of comforts and indulgences too low. Very rigid views of what is necessary for the support of life usually prevail, wherever the affluent have to dictate a style of living for the poor. The tendency there is to reduce allowances as nearly as possible to what may be called the *immediate necessaries*; for it does not seem just or right that paupers, adults or children, should enjoy any species of gratification. But these are short-sighted views. The health of these unfortunate persons requires something more, and this something would be granted by an enlightened humanity. We have a strong manifestation of this need in the eagerness with which paupers generally desire allowances of tea or tobacco, or indeed the least variation of their diet. The craving for these luxuries is not so much, what it is generally thought solely to be, the result of bad habits long indulged in, as it is the expression of a want in the personal economy—a want which, by one means or another, must be supplied, or injurious consequences will ensue.

EXEMPTION FROM HARASSING CARES.

It is little more than a repetition of doctrines already laid down, that, for health, a human being requires an exemption from acute distress of mind and harassing cares.

Mental distress and anxiety operate through the brain upon the condition of the whole body, and, when long protracted, effectually undermine the health. "It is impossible," says Dr. Smith, "to maintain the physical processes in a natural and vigorous condition, if the mind be in a state of suffering. Every one must have observed the altered appearance of persons who have sustained calamity. A misfortune, that struck to the heart, happened to a person a year ago: observe him some time afterwards—he is wasted, worn, the miserable shadow of himself; inquire about him at the distance of a few months—he is no more." It is Dr. Smith's opinion that the nearest cause of many suicides is not strictly a desire to escape from a state of suffering, but some disease, probably inflammation of the brain, brought on by distress of mind. "By a certain amount and intensity of misery, life may be suddenly destroyed; by a smaller amount and intensity, it may be slowly worn out and exhausted The state of the mind affects the physical condition; the continuance of life is wholly dependent on the physical condition; it follows that, in the degree in which the state of the mind is capable of affecting the physical condition, it is capable of influencing the duration of life."

Depression of mind, besides its immediate effect on the nervous system, deranges the respiration and mars the proper oxygenation and circulation of the blood. A diminished vitality is the consequence, often leading to pulmonary consumption. An excessive agitation and alarm of the selfish feelings, such as takes place in some minds on the approach of an epidemic, affects the whole system in such a way as—to use an expressive phrase of Dr. Combe—"places it on the brink of disease;" and hence the notoriously great liability of persons in this state of alarm and apprehension to fall victims to the malady when it comes. It has been remarked that an army in a high state of confidence and cheerfulness after a victory, has a much smaller proportion of sick than in the opposite circumstances, or even in its ordinary condition. The usual proportion of sick in a garrison quartered, during peace, in a healthy country, is five per cent.; during a campaign, when there is more anxiety of mind, it is ten; in the event of defeat, although the circumstances be otherwise not unfavourable, the proportion rises to a much higher amount. It is a very instructive fact, that in a large detachment of the French army cantoned in Bavaria immediately after the battle of Austerlitz, the proportion of sick was little more than *one* per cent.

GENERAL OBSERVATIONS.

The fundamental principle of all efforts to improve and preserve health has been thus stated:—"Man, as an organized being, is subject to organic laws, as much as the inanimate bodies which surround him are to laws mechanical and chemical; and we can as little escape the consequences of neglect or violation of those natural laws, which affect organic life through the air we breathe, the food we eat, and the exercise we take, as a stone projected from the hand, or a shot from the mouth of a cannon, can place itself beyond the bounds of gravitation." It may be added, that "all human science, all the arts of civilized man, consist of discoveries made by us of the laws impressed upon nature by the Author of the universe, and the applications of those laws to the conditions—which are laws also—in which man and the particular bodies and substances around him are placed; nor, it is manifest, should any science concern us more than that which relates to the conditions on which organic life is held by each individual."

The preceding sections are but explanations, such as we have been able to afford, of the conditions under which the organic frame of man exists, and the agencies, internal and external, which operate upon it, for the maintenance of health or the introduction of disease. It must be evident, where there is a conviction of the truth of the fundamental doctrine, that individuals and societies have their health very much at their own disposal; that a careful avoidance, on the one hand, of what is noxious, and a judicious attention to what is beneficial are what are chiefly necessary for the preservation of the human frame in health to old age; and that premature deaths, over and above those which result from unforseen casualties, instead of being, as supposed by the untutored mind, a mysterious and irreversible decree of Providence, are simply the natural effect of our own violation of laws which Providence has appointed for our welfare. It might still be objected that human nature is such, that the due obedience and observance of those natural ordinances are not to be expected; so that the vast quantity of disease, and the great number of premature deaths, which afflict our present state of being, are equally to be regarded as things immutable, and therefore to be tranquilly submitted to. But this view would be not less a mistaken one; for there is no fact more clearly ascertained, than that disease and premature deaths are not, and never have been, fixed at any given amount, but yield constantly to the power of any new conditions which man may be able to introduce. Regarding clear views on this subject as of great importance, we shall here enter a little into detail.

The object is, we apprehend, to show that sickness and mortality vary both in place and in time, according to physical and organic conditions.

Inquiries into these subjects were not made in ancient times; but, during the last two hundred years, such facts have been recorded as enable us to ascertain that, in that space of time, with regard to nearly the whole of Europe, there has been a gradual improvement in health and life, in proportion to improved conditions. In Sweden, for instance, between 1756 and 1763, the annual mortality was, for males, 1 in 33¼; for females, 1 in 35½; whereas, in the year 1800, it had diminished to 1 in 34½ for males, and 1 in 37½ for females. From mortuary tables preserved with considerable accuracy at Geneva, it appears that, at the time of the Reformation, one-half of the children born died within the sixth year; in the seventeenth century, not until the twelfth year; in the eighteenth century, not until the twenty-seventh year; consequently, in the space of about three centuries, the probability that a child born in Geneva would arrive at maturity, has increased fivefold. In London, in the year 1606, the annual deaths were 1 in 14½, or 7 per cent. of the population; and in plague years during that century it reached 25 in 100, or every fourth man, woman, and child! *In* 1838, *it was only* 1 *in* 35½. Knowing that, at the former period, the city was dense and ill-cleaned, and that the habits of the people were not then what they are now, we cannot doubt that this diminution of mortality to less than one-half, is owing to the improved conditions in which human beings now live in the metropolis. Between the years 1730 and 1750, 74 of every 100 children born in London, died before they were six years of age; but in more recent times, only 31 and a fraction out of every 100 die under the same age; that is to say, the deaths of children in London were then more than twice as numerous as they are now. About a century ago, the mortality of the children received into the London hospitals was of astonishing amount. Though the fact seems scarcely credible, we believe there is no good reason to doubt, that of the 2800 annually received, 2690, or *twenty-three in every twenty-four*, died before they were a year old. It was at length seen that this mortality was the effect of over-crowding, impure air, and imperfect aliment; and, after an act of parliament had been procured to compel the officers to send the infants to nurse in the country, only 450 out of 2800 died in the first year. It has been ascertained that, during the last century, about a third has been added to the average expectation of life; that is to say, an individual now has as good a chance of living forty years, as he had a hundred years ago of living thirty. To what can such a fact be owing but to the diminution of the causes of disease in the improved conditions of the people.

The facts ascertained with regard to differences of mortality in different places are equally striking. A remarkable instance of the effect of marshes upon health is cited by M. Villermé. Formerly the district of Vareggio in Tuscany was in this condition, and its few miserable inhabitants were every year visited by severe agues. In 1741, floodgates were erected to keep out the sea, the marsh was dried up, and ague appeared no more. Vareggio subsequently became a populous and healthy district. The Isle of Ely is a marshy district in the east of England, and it was ascertained that of 10,000 deaths which occurred in it between the years 1813 and 1830, no fewer than 4732 were of children under 10 years of age; the proportion of deaths of children under ten in all the other agricultural districts of England being only 3505, or as about 3 to 4 of the former number. Of 10,000 deaths between ten years and extreme old age, in the same period, there were, of persons between ten and forty, 3712 in the Isle of Ely, and only 3142 in drier districts. There are some remarkable discrepancies of mortality in different counties of England. While the proportion of annual deaths in every hundred persons under six years of age is, for the whole of England and Wales, about five and a third, the proportion in Suffolk is three and a half, in Warwick six, in Middlesex eight and a third. Suffolk is an agricultural county; Warwick contains Birmingham and some other large towns; and the metropolis is situated in Middlesex: can we resist concluding that the pure air and constant exercise which children obtain in the country are the immediate means of prolonging their lives; while the narrow accommodations, impure air, and limited exercise, to be had in large towns, have exactly the contrary effect? In the general population of England, 443 in 1000 die under ten years of age; but in Manchester and Salford the number is a third larger, or 602. Here, the miserable circumstances of many of the humbler classes in Manchester—above eighteen thousand of them, for one thing, living *in cellars*—must be considered as the immediate cause of the disproportioned mortality. When the general mortality of London is, as stated, 1 annually in 35¼, there are great differences with respect to different districts. In Camberwell, an open suburban district, it is 1 in 52; in

Hackney a similar district, 1 in 54; but in the huddled district of St. George's, Southwark, it is 1 in 30; and in the still more dense and miserable region of Whitechapel, so much as 1 in 26, or exactly double the mortality of Camberwell. A curious investigation has been made in London, to ascertain the effect of density of population upon health. In a large district, where the population is so dense that there is only 35 square yards for each person, the annual mortality is 3426; in another district of the same population, where each individual has an allowance of 119 square yards, the mortality sinks to 2786; in a third, where there are 180 square yards to each person, the mortality is only 2289, or under two-thirds of what it is in the closest of the three districts. It was also found that, in the three districts, the mortality from typus fever was, respectively, as we go from the roomiest to the closest, 131, 181, and 349. The proportion of sickness and mortality which the poor suffer in comparison with the rich, is thus placed in a striking point of view. Precisely similar results have been discovered in Paris. M. Villermé has there ascertained, that the deaths in some poor arrondissements are just double what they are in the rich. He states that, taking the whole of the French population, human life is protracted twelve and a half years among the wealthy beyond its duration among the poor; consequently, in the one class, a child, newly born, has a probability of living forty-two and a half years; in the other, only thirty years.

Taking the whole of the above facts into account, we must see that not only do health and longevity depend expressly on laws, the operation of which we can understand, but man has it in his power to modify to a great extent the circumstances in which he lives, with a view to the promotion of his organic well-being and preservation. We see that the draining of a marsh banishes the ague, that a change from city to country air diminishes mortality, and that the greater comforts possessed by the affluent secure them longer life than the poor. It may not immediately be in the power of every one to change his circumstances from the unhealthy to the healthy; but it is a great matter to know that the object is within human power, for then at least an encouragement is held out to induce each individual to make every possible effort to put himself, and to contribute to putting society, into more salubrious conditions.

The object may be said to depend partly upon individual and partly upon social efforts. Every person has some control over the quantity and quality of the food he eats, the condition of the air he breathes, and the exercise, repose, and recreation which are demanded by his muscular and nervous system, according to the principles laid down in this and similar treatises; as also some power to refrain from injurious excesses, and to avoid the various external agencies of a detrimental kind, which constantly beset him. Let him act as he ought to do in these respects, and he will reap an immediate reward in that pleasurable state of consciousness which attends a healthy condition. But some of the most important requisites for health depend on public measures. The amount of the necessaries and comforts of life to be obtained by the great mass of the operative classes in all countries, depends very much upon regulations which may have been made with regard to *production* and *exchange*, as also those which may have been made for instructing and morally elevating and sustaining the bulk of the people. It unfortunately happens, in most countries, that, while the bearing of certain acts upon individual happiness is fully seen and provided for, those which affect the condition of communities are imperfectly understood; so that measures destructively injurious to millions will be enforced and defended by those who would severely punish the slightest wrong inflicted by one man upon another.

Measures for improving general condition with respect to air and exercise, are perhaps more readily practicable: yet here also the bearing of active principles upon great masses is so dimly seen, that, not to speak of more positive difficulties, it is usually long before proper sanatory regulations are made.

Some facts elicited by recent parliamentary inquiry with regard to several of our principal cities, are of the most startling kind.

Dr. Arnott, when examined as to the prevalence of fever in Bethnal Green, Whitechapel, Wapping, and certain other districts in London, attributed them directly to the dirty and neglected state of these localities, instancing—"Houses, courts, and alleys without privies, without covered drains, and with only open surface gutters, so ill made that the fluid in many cases was stagnant; large open ditches containing stagnant liquid filth; houses dirty beyond description, as if never washed or swept, and extremely crowded with inhabitants; heaps of refuse and rubbish, vegetable and animal remains, at the bottom of close courts and in corners." [The amount of noxious matter which is hoarded or allowed to rest in London, is far beyond what most of its inhabitants have any conception of, as is the case with most other conditions chiefly or solely affecting the poor.] In Manchester, 19,300 persons, or one-twelfth of the whole working population, live beneath the level of the ground, with an insufficiency of both light and air. In that town, the dwellings of labourers are often built in close narrow courts, and back to back, so as to prevent ventilation; the drains are far from sufficient, and there is not in the town one free space in which the people can enjoy the slightest recreation. In Liverpool, 39,000 persons live in cellars, dark, damp, confined, ill-ventilated, and dirty. The class next above, to the number of 80,000, inhabit houses built around small courts, closely pent up, back to back, with only one entrance to each, and usually a receptacle for refuse in the centre; an arrangement which appears as if it had been expressly calculated to keep health low and mortality high. In Leeds, a similar style of building obtains, with a similar train of circumstances, "no effective drainage, inspection, or system of paving or cleansing." The greater part of this town was described in 1839 as "in a most filthy condition, demanding an immediate remedy." It was mentioned, that in a certain dirty yard, there was a house which for many years had been the seat of a disease of a very malignant character three years ago, the attention of the commissioners of police was directed to the extremely imperfect drainage of the surface-water; at that time a better escape for the refuse water was provided; and since that period, says the reporter, "I believe, *we have not had a single case of fever from that particular locality.*" Narrow alleys and close courts, with wet filth constantly exhaling within them, and containing a close huddled population of extremely poor persons, exist in Edinburgh, where, however, an exposure to high winds makes the evil less pestilential. In Glasgow, a comparatively level city, the same peculiarity exists to perhaps a greater extent than in any other British city. This, added to the miserably insufficient succour extended by law to the poor in Scotland, renders Glasgow one of the unhealthiest cities in Europe; the mortality of the year 1837 being 1 in 24½, and the number of fever cases for the five years before 1839 at an average of 11,118 per annum. Here, also, we have a most notable instance of the counteractive power of a single sanatory principle; for a house containing above five hundred poor inhabitants, having been ventilated by a draught from each room in 1832, fever, which had previously never been absent from that dwelling, was nearly banished, only four cases occurring in the ensuing eight years, though fever raged during that period in all the districts of the city occupied by the poorer classes.

COMMERCE—MONEY—BANKS.

COMMERCE.

Man has been defined by some naturalists as an *exchanging animal*—an animal who buys and sells, that being a thing performed by no other living creature, and therefore suitable as a distinction in character, though others, much more exalted, might readily be found. The practice of exchanging one commodity for another is doubtless coeval with the first herding of mankind together. No man, even in the rudest savage state, and who lives in the society of neighbours, can rest satisfied with such objects as he can procure or fashion by his own labour. He must depend on others for assistance, while he assists them in return. The cultivator of the ground would exchange some of its produce for an animal from the flocks of his neighbour; and both would be glad to give a portion of their wealth for the clothing or weapons made by a third party. Thus, *exchanging* becomes a matter of convenience between two parties, each of whom is anxious to obtain a share of the other's goods for a share of his own, and a mutual advantage is the result. Such desires and practices must have been displayed in the very earliest stages of society. No nation of African or Indian savages is ever found without a strong inclination to exchange the rude products of their country for the articles possessed by the traveller; an ox or sheep being perhaps eagerly offered by them for a single needle, a nail, or a small toy looking-glass.

As mankind advance in their social condition, the practice of exchanging increases; the desires and necessities become more urgent; each person finds it more profitable and agreeable to adopt and hold by one fixed employment, and to sell the produce of his labour for a variety of articles made by others, than to attempt to make every thing for himself; and, finally, for the sake of convenience, a class of persons are engaged to conduct the exchanges from one hand to another. In this improved condition, the production of articles of general consumption is called *manufacturing*; while that department of industry in which the exchanging is transacted is called *trade* or *commerce*. For still further convenience, the business of exchanging is committed to several orders of traders—the wholesale merchants, who in the first instance purchase large quantities of goods from the producers; the retail dealers, who have been supplied in smaller quantities from the merchants, and sell individual articles or minute portions to the public; and to these sometimes an intermediate dealer is added. In this manner the transfer from the workshop of the manufacturer to the house of the actual consumer is interrupted by several distinct processes of exchange, in which each seller obtains a certain profit at the expense of the person who has ultimately to buy and use the article. It is a principle of trade, that the fewer hands through which any article is made to pass, the better for the consumer, because the article can be brought with the least burden of profits, or at the lowest price, into general use. But this principle, sound as it is in the abstract, is counteracted by another which must on no account be lost sight of. This is the principle of *convenience*. A manufacturer engaged deeply in his own pursuits finds it more profitable and agreeable to sell his articles in large than small quantities. The maker of millions of yards of cloth has no time to spend in selling single yards. If he were compelled to sell by retail, he would have no time to conduct his affairs; he could manufacture only a small quantity, and, therefore, being limited in his amount of produce and sales, he must take larger profits. Thus, upon the whole, it is much better for all concerned to allow the manufacturer to pursue his own way in selling only very large quantities to wholesale merchants. To these traders the same rule may be applied. They seek out the seats of manufacture; and, purchasing a large variety of goods, they send them to the towns and places where they are required by the public, and there the articles can be had individually from a shop. It is evident that if any man wish to buy a handkerchief, he may procure it much more cheaply from any shop in which such things are sold at an advance upon the original cost, than if he were to travel perhaps hundreds of miles to the house of the manufacturer, and there make the purchase. The use of an intermediate class to conduct exchanges is thus very conspicuous; and any attempt to revert, generally, to the original practice of causing the maker to deal with the consumer, would be entirely incompatible with an enlarged system of trade between different countries, or even between different places in the same country. We say generally, because there are instances in which makers may, with advantage to themselves and the community, sell their produce in small quantities or single articles to the public, but these are exceptions to a common rule.

Convenience, it is evident, forms a guiding principle of trade, and requires the same consideration as the actual value of an article. This, however, has been recognised only in very recent times. At one period there were laws to prevent farmers from selling their grain in a large quantity or by the lump, without exposing it in an open market. Such laws were manifestly unjust. They interfered with the liberty of the former, who in his capacity of manufacturer had surely a right to sell his produce in whichever way he felt it to be most for his advantage. It would be the same kind of injustice, if the law were to prevent a manufacturer of handkerchiefs from selling them at his own workshop to wholesale dealers, and causing him to take them many miles to a certain street in a certain town, and there expose them for sale in small lots to the public. It is of the greatest importance in matters of trade and commerce *never to interfere in any shape to prevent men from dealing in whatever manner appears most beneficial and convenient to themselves, provided it be conformable with strict justice.* By being left to consult their own inclinations, the public, in the end, though probably in a way not easily recognisable by an unreflecting mind, reaps the advantage.

Commerce, by which we comprehend traffic carried on at home or with foreign countries, is of great antiquity, and, both in the earliest times and in our own day, has been one of the principal engines of civilization. Among the industrious nations which at a remote period of history were planted on the borders of the Mediterranean Sea, it became a means of spreading knowledge in the interior of Asia, and many parts of Africa and Europe. Unfortunately, the intelligence which was so disseminated was afterwards obliterated by the overruling powers of barbarous and warlike nations; but the efficacy of commerce in modern times is likely to be permanent wherever its influence is extended, seeing that the greatest manufacturing and mercantile people are at the same time the most powerful and most capable of offering protection to those who sustain a commercial intercourse with them. It is exceedingly pleasing thus to reflect on what commerce is capable of effecting, independent of the actual comfort which it produces, wherever it is fairly introduced. By its appeals to the selfishness, the vanity, and other passions, good and bad, of mankind, it appears to be the best of all forerunners to the efforts of the schoolmaster

and the missionary. Its influence in this respect has been remarkably exemplified in the boundless regions of Hindostan, which by the efforts of a company of merchants, have been laid open to the settlement of enlightened men from Europe, who, though by slow degrees, will ultimately spread the blessings of education, and the decencies of social life, among many millions of human beings. In the remote islands in the Pacific Ocean, the influence of commerce has been recently of marked utility. The introduction of articles of a fanciful nature, both for the ornamenting and covering of the person, has induced a desire of following European manners and customs; and as these commodities cannot be procured but by the exchange of native commodities, a spirit of industry has consequently been produced, which cannot fail to be of both moral and physical advantage to the natives. It is always thus with the intercourse which commerce necessarily involves. New tastes are created, and to be gratified, industry must be exerted. But to witness the extraordinary influence of commerce in producing civilized and refined habits, we need not look beyond our own country. Commerce, in this its chosen seat, has caused roads everywhere to be cut, canals to be opened, railways to be formed, expeditious modes of travelling by sea and land to be effected; all of which great accessories to our comfort have tended in the most wonderful manner to introduce not only useful commodities and personal luxuries, but highly cultivated sentiments, literature, and the arts, into districts which at no distant period lay in a comparatively primitive condition. The intercourse which commerce in this manner requires, is the grand lever which, it is apparent, must in the first place be employed to lift the load of ignorance from off the natives of Africa; and when this lever is properly insinuated, the way will soon be prepared for the introduction of those measures of melioration which philanthropists so anxiously design.

It is obvious that this scheme of mutual interchange among nations of the commodities which they respectively produce, is agreeable to every rational principle, and must have been designed by a wise Providence for the universal benefit of his creatures. In order that manufactures may be produced, and commerce brought in to disseminate them both at home and abroad where they are wanted, no species of legislative enactment is requisite either to encourage or direct. The law which governs production and consumption is a law of nature—it is the overruling principle of *self-interest*, by which only that quantity of manufactures is produced which can be advantageously disposed of, and only those commodities purchased and consumed which the wants of individuals require. And, curiously enough, this principle of self-interest, if allowed free scope, is uniformly and sufficiently competent to regulate both the production and consumption of commodities, to a degree more nice and satisfactory than could be attained by the best-devised statutes which the wisest legislators could enact. The grand principle, therefore, which can alone regulate commerce and manufactures, is found in the natural passion for gain; and the sole essential requisite for the successful advancement of mercantile and manufacturing industry and wealth among the people, is for the people to be let alone.

Evident as these principles must be to all who have any knowledge of social life, they have, either from ignorance or some other cause, been generally lost sight of by governments in all ages of the world, and plans have been contrived to regulate that which, if left alone, would have much better regulated itself. To such an extent have regulating and restrictive laws been carried in some countries, that they have nearly annihilated both manufactures and legitimate commerce, and reduced masses of the people to the condition of paupers, besides encouraging the pernicious and demoralizing pursuits of the smuggler. The restrictions and regulations which governments usually impose upon commerce, do not perhaps originate so much in the plea that manufacturers and merchants stand in the condition of children, and require to be taken care of lest they should hurt themselves, as from the unfortunate exigencies under which the governments happen to be placed. They have all less or more engaged in wars, which have been conducted at an enormous expense to their respective countries. In order to liquidate these expenses, all kinds of taxes are levied, directly and indirectly; but as the levying of these taxes breeds discontent, large bodies of military have usually to be kept up, to act as an armed national police. Thus, the people of these countries have for ages to go on paying not only the price of the wars, or the interest of the sums borrowed and laid out upon the wars, but as much more for the military force afterwards imposed upon them. What is more distressing, the people have probably to give a deal of money, in order that their respective governments may be the more able to secure the attachment of men of consequence to assist in allaying the general clamours for a redress of grievances. This is a very rough view of the matter, but it is enough to show the dreadful exigencies into which nations fall, by their engaging in wars or other expensive follies. In whatever manner, however, national exigencies originate, the plan pursued for relief consists chiefly in the imposition of duties on certain commodities much in demand, and at various stages of their manufacture, transmission, and sale. It is likewise customary to impose duties on goods imported from foreign countries, with the view of protecting the manufacturers of such articles in this country; but this only benefits a class, or a few persons, at the expense of the whole community, and, therefore, all such duties are in the main as detrimental to trade and the public welfare as those imposed for the liquidation of national debt and expenditure.* "There is (observes Mr. M'Culloch) no jugglery in commerce. Whether it be carried on between individuals of the same country, or of different countries, it is in all cases bottomed on a fair principle of reciprocity. Those who will not buy need not expect to sell, and conversely. It is impossible to export without making a corresponding importation. We get nothing from the foreigner gratuitously; and hence, when we prevent the importation of produce from abroad, we prevent, by the very same act, the exportation of an equal amount of British produce. All that the exclusion of foreign commodities ever effects, is the substitution of one sort of demand for another. It has been said, that 'when we drink beer and porter we consume the produce of English industry, whereas, when we drink port or claret we consume the produce of the industry of the Portuguese and French, to the obvious advantage of the latter, and the prejudice of our countrymen!' But how paradoxical soever the assertion may at first sight appear, there is not at bottom any real distinction between the two cases. What is it that induces foreigners to supply us with port and claret? The answer is obvious:—We either send directly to Portugal and France *an equivalent in British produce*, or we send such equivalent, in the first place, to South America for bullion, and then send that bullion to the Continent to pay for the wine. And hence it is as clear as the sun at noonday, that the Englishman who drinks only French wine, who eats only bread made of Polish wheat, and who wears only Saxon cloth, gives, by occasioning the exportation of a corresponding amount of British cotton, hardware, leather, or other produce, the same encouragement to the industry of his countrymen, that he would were he to consume nothing not immediately produced at home. A quantity of port-wine and a quantity of Birmingham goods are respectively of the same value

*See article POLITICAL ECONOMY.

so that, whether we directly consume the hardware, or having exchanged it for the wine, consume the latter, in so far as the employment of British labour is concerned, it is altogether indifferent."*

From these explanations, it will be observed that it is immaterial what is given in exchange for imported goods —whether money or native produce. At the same time, it must be understood that if money is given, there must exist some active industry in the country by which the money is realized. As a general question in commerce, it is of no consequence what is the nature of the industry by which the money is produced. It may consist in the raising of superabundant crops, or other raw produce for exportation, or of manufacturing raw and comparatively valueless materials into articles of value and demand, or of carrying goods from one country to another. Unless a country possess one or more of these branches of industry, it is without the means of paying for imported articles, and must retire from the field of general commerce. England is not of sufficiently large dimensions to export superabundant crops of grain, but it possesses in an extraordinary degree the means of manufacturing mineral and other substances into articles for exchange, and it derives no inconsiderable profit from the carrying of commodities. Its manufactured goods, therefore, pay for imports of foreign articles, including bullion or the raw material of money, and these again, in a manufactured state, are a fund for the payment of still further imports. Thus the wealth of our country has increased.

PRINCIPLES OF COMMERCE.

The practice of commerce is in a great measure dependent on mutual good faith, and the integrity of seller and buyer, and can in no case permanently flourish where these fundamental qualities are wanting. The first or great leading quality, therefore, in the character of a merchant, ought to be scrupulous honesty both in word and deed. The article which he proposes to dispose of must be exactly what he declares it to be, not inferior or in any respect unsound in its nature. If it possess any blemishes, these must be announced to the buyer before the bargain is concluded, and, if necessary, though at a considerable loss, an allowance made for them. The merchant is not less called on to be faithful in the fulfilment of all promises which he may make, whether with respect to goods or their payment; because those to whom the promises have been made may on that account have made similar promises to others, and, therefore, the breaking of a single promise may prove injurious in every link of a whole train of transactions. Perfect honesty or integrity is a fundamental principle of trade; and the next most important are, strict regularity in all proceedings, according to established usage, and also steady perseverance. The merchant must give regular attendance during the hours of business, be regular in executing all orders and answering all letters; regular in the keeping of his books, and in the reckoning of his stock and moneys; in short, he must be methodic and careful in all branches of his concerns, for without this species of attention, the best business is apt to become confused, and to be ultimately ruined. What is true of individuals is true when applied to a whole nation. No people have ever attained opulence and high mercantile consideration, who have not possessed a character for integrity and regularity in all their dealings.

Besides these indispensable qualities in the individual character of a merchant or tradesman, there is required a happy combination of enterprise and prudence with the utmost coolness—enterprise to embrace favourable opportunities of buying and selling, and prudence and coolness to restrain from engaging in over-hazardous and ruinous speculations. In all his transactions, the man of business is understood to proceed upon a cool inflexible principle of doing that which is most advantageous for himself, without fear or favour; because in commerce each party is supposed to be governed by motives of self-interest (always within the rules of honesty and propriety), and is under no obligation to deal from mere personal regard, or any kind of friendly consideration. In commerce there is, strictly speaking, no friendship. If there be friendship among the parties concerned, it is a thing aloof from business transactions—a matter of private arrangement—and is only to be regarded as such. On this account, even among the most intimate friends, there must be an exact mode of dealing, and the most accurate counting and reckoning.

The British, for several centuries, seem to have been endowed, above all other nations, with those qualities of mind which are suitable for the conducting of commerce on an enlarged and liberal scale. Their integrity, persevering industry, enterprise, prudence, and liberality of sentiment, have never been excelled. In patient industry they have been rivalled by the Dutch; but in point of enterprise and liberality, that people have fallen far short of them, and their trade has languished accordingly. The British are pre-eminently a commercial as well as a manufacturing people. Taking them generally, they possess a spirit of restless industry, which renders them actually unhappy, unless when busily engaged in some pursuit calculated to enrich them, or at least to produce for their families the means of a respectable subsistence. The Americans, who are but a branch of the same British stock, are equally, if not more, remarkable for this fervent spirit of industry; and, though only set up as a separate nation within a period of sixty years, and less distinguished for their integrity and prudence than the English, have already distanced many of those dignified European principalities and powers which first discovered and colonized their country. The French, the Germans, the Spaniards, the Portuguese, the Italians, and others, though each possessing a larger or smaller extent of manufactures and commerce, are obviously deficient, in a national sense, of the eager spirit of industry which is so characteristic of the people of Great Britain. Taken in the gross, they are too apt to addict themselves to amusement in preference to business. They delight in holidays, and will at any time leave their work to mingle in a dance or some kind of buffoonery, in which an Englishman would be ashamed to appear. Scarcely one of the continental nations, moreover, has yet settled down under a well-conducted government appointed by the people. There indeed seems to be little which is settled among them. Some of the principal are yet at that stage of social life which was common in England about the reign of Henry VII.; others are not farther advanced than a period considerably earlier; and all have yet a great deal to suffer and to learn before they attain that state of quietude and security to life and property, that condition of domestic comfort and national prosperity, which Great Britain, with all its faults, so amply enjoys.

COMMERCIAL TERMS AND TRANSACTIONS.

The following explanations of the principal terms used in commerce, will illustrate the mode of conducting business transactions.

Firm.—Every business, whether private or public, is conducted under a specified designation or title, called the name of the firm. This name may be that of a single individual to whom the business belongs, or of two or more individuals, or any title which it may be found advisable to adopt. Sometimes the name of a firm remains long after all who are indicated by it are dead

* Dictionary of Commerce.

in such a case, the business has passed into the hands of new proprietors, who, though legally responsible for its obligations, are not for some private reason inclined to change the old and well-known title of their firm. A particular firm or business-concern is sometimes personified in the term *house*—as, Such a house does a great deal of business, &c.

Company.—Two or more individuals engaged in one business constitute a company or copartnery, each individual being called a partner. Companies are of two kinds, private and public. A private company is organized by a private arrangement among the parties, each having certain duties to perform and a certain share in the concern. In companies of the private and common description, no individual can leave the concern at his own pleasure, for by doing so he might seriously injure or embarrass his partners. He can withdraw only after giving a reasonable warning, by which time is allowed to wind up the concern, or place it in a condition to pay him back the capital which he has risked, or the profits which are his due. No partner, however, can transfer his share to another person, by which a new member would be introduced into the firm without the consent of the partners.

The profits of partnerships are divided according to a specified agreement or deed of copartnery. Generally, in the case of partnerships of two or three persons, each receives the same share on the occasion of an annual division, but in other cases, a partner may not be entitled to more than a fourth or sixth part of what another receives. The amount of capital which a partner invests in the concern, the service he can be to the business, and other circumstances, regulate the amount of his share. When each of two persons sinks the same capital, but one takes the whole of the trouble, then he on whom the trouble falls, who is called the active partner, is entitled to receive a stated sum in the form of salary over and above his share of profits. Whatever be the share which individual partners have in a concern, the whole are equally liable for the debts incurred by the company, because the public give credit only on the faith that the company generally is responsible. He who draws the smallest fraction of profit, failing the others, may be compelled to pay the whole debts. On this account, every partner on leaving a company should be careful to advertise in the Gazette and newspapers that he no longer belongs to the firm of which he was a member; he is then responsible for no debts incurred subsequent to the announcement.

Public companies are very different; they consist of a large body of partners, or proprietors of shares, the aggregate amount of which forms a joint stock, and hence such associations are called *joint-stock companies*. They are public, from being constituted of all persons who choose to purchase shares, and these shares or rights of partnership are also publicly saleable at any time without the consent of the company. The value of a share in a joint-stock company is always the price which it will bring in the market; and this may be either greater or less, in any proportion, than the sum which its owner stands credited for in the stock of the company. Unless specially provided for in the fundamental deed of copartnery, every member of a joint-stock company is liable in his whole personal property or fortune for the debts of the concern. In some instances this liability is obviated by the provisions of an act of parliament, or parliamentary charter, establishing the company. Joint-stock companies are managed by directors appointed by the shareholders.

It is an axiom in commerce, that business is much better conducted by single individuals for their own behoof, than by companies of any kind; as respects joint-stock associations, they are only useful in very great concerns, requiring enormous capital, and involving serious risks of loss.

Capital.—What is now termed capital was in former times called *stock*. The capital of a merchant is strictly the amount of money which he embarks in his trade, or trades upon, that is, employs for buying goods, paying wages of servants, and liquidating all debts when due. When trading within the limits of his capital, business is done upon a secure footing; but if he proceeds beyond these, in any material degree, he is said to be *over-trading*, and is exposed to the chance of ruin or very serious embarrassment. Trading beyond the amount of available capital, is, nevertheless, a prevailing error, and causes innumerable bankruptcies. With a comparatively small capital, a tradesman may carry on a large business, by receiving payments shortly after making his outlays. By this means, there is a rapid turning over of money, and small profits upon the various transactions speedily mount up to a large revenue. For example, if a tradesman turn over his capital twelve times in the year, at each time receiving money for what he sells, he can afford to do business on a twelve times less profit than if he could turn over the same capital only once in a year. This leads us to a consideration of credit.

Credit.—Credit in business is of the nature of a loan, and is founded on a confidence in the integrity of the person credited, or the borrower. An individual wishes to buy an article from a tradesman, but he has not money to pay for it, and requires to have it on credit, giving either a special or implied promise to pay its value at a future time. This is getting credit; and it is clear that the seller is a lender to the buyer. In all such cases, the seller must be remunerated for making his loan. He cannot afford to sell on credit on the same favourable terms as for ready money; because, if he were to receive the money when he sold the article, he could lay it out to some advantage, or turn it over with other portions of its capital. By taking credit, the buyer deprives the seller of the opportunity of making this profit, and accordingly he must pay a higher price for the article, the price being increased in proportion to the length of credit. It very ordinarily happens that the seller himself has purchased the article on credit; but this only serves to increase its price to the consumer, and does not prevent the last seller from charging for the credit which he gives and the risk of ultimate payment which he runs. Credit for a short period is almost essential in all great transactions; but when going beyond fair and reasonable limits, it acts most perniciously on trade, by inducing heedless speculation, and causing an undue increase in the number of dealers with little or no capital. An excessive competition among these penniless adventurers is the consequence; each strives to undersell the other, with the hope of getting money to meet his obligations, and thus vast quantities of goods are sometimes thrown upon the market below the original cost, greatly to the injury of the manufacturer and the regular trader. What are called "gluts in the market" frequently ensue from causes of this nature.

Defoe, who wrote upwards of a century ago, makes the following observations on credit and over-trading, in his Complete English Tradesman:—"There are two things which may properly be called over-trading, and by both of which tradesmen are often overthrown:—1. Trading beyond their stock [or capital]; 2. Giving too large credit. A tradesman ought to consider and measure well the extent of his own strength: his stock of money and credit is properly his beginning; for credit is a stock as well as money. He that takes too much credit is really in as much danger as he that gives too much credit; and the danger lies particularly in this, if the tradesman over-buys himself, that is, buys faster than he can sell, buying upon credit the payments perhaps

become due too soon for him; the goods not being sold, he must answer the bills upon the strength of his proper stock—that is, pay for them out of his own cash; if that should not hold out, he is obliged to put off his bills after they are due, or suffer the impertinence of being dunned by the creditor, and perhaps by servants and apprentices, and that with the usual indecencies of such kind of people. This impairs his credit, and if he comes to deal with the same merchant or clothier, or other tradesman again, he is treated like one that is but an indifferent paymaster; and though they may give him credit as before, yet depending that if he bargains for six months, he will take eight or nine in the payment, they consider it in the price, and use him accordingly; and this impairs his gain, so that loss of credit is indeed loss of money, and this weakens him both ways.

"A tradesman, therefore, especially at his beginning, ought to be very wary of taking too much credit; he had much better slip the occasion of buying now and then a bargain to his advantage, for that is usually the temptation, than buying a greater quantity of goods than he can pay for, run into debt, and be insulted, and at last ruined. Merchants, and wholesale dealers, to put off their goods, are very apt to prompt young shopkeepers and young tradesmen to buy great quantities of goods, and take large credit at first; but it is a snare that many a young beginner has fallen into, and been ruined in the very bud; for if the young beginner does not find a vent for the quantity, he is undone; for at the time of payment the merchant expects his money, whether the goods are sold or not: and if he cannot pay he is gone at once. The tradesman that buys warily, always pays surely, and every young beginner ought to buy cautiously; if he has money to pay, he need never to fear goods to be had; the merchants' warehouses are always open, and he may supply himself upon all occasions, as he wants, and as his customers call." It certainly "is not possible in a country where there is such an infinite extent of trade as we see managed in this kingdom, that either on one hand or another it can be carried on without reciprocal credit both taken and given; but it is so nice an affair, that I am of opinion as many tradesmen break with giving too much credit as break with taking it. The danger, indeed, is mutual, and very great. Whatever, then, the young tradesman omits, let him guard against both giving and taking too much credit."

Orders.—An order is a request from one dealer to another to supply certain goods. An order, when in writing, should be plain, explicit, and contain no more words than are necessary to convey the sense in a simple, courteous manner. The same rule applies to all letters of business, which, by the practice of trade, are confined to their legitimate object. He that affects a rambling and bombastic style, and fills his letters with long harangues, compliments, and flourishes, should turn poet instead of tradesman, and set up for a wit, not a shopkeeper. A tradesman's letters should be plain, concise, and to the purpose; no quaint expressions, no bookphrases; and yet they must be full and sufficient to express what he means, so as not to be doubtful, much less unintelligible. We can by no means approve of studied abbreviations, or leaving out needful conjunctive terms and pronouns in trading letters; as, for example, "Have just received yours of the 11th," &c.; which ought to be expressed as follows—"I have just received your communication of the 11th instant," &c. The leaving out of pronouns and other words in a business letter, gives it a mean appearance.

Counting-house; in French *bureau*; in Dutch *kantoor*.—The counting-house is the office in which a merchant's literary correspondence, book-keeping, and other business is conducted. The English merchant's counting-house is a model of neatness and regularity. Its furniture consists chiefly of desks for the clerks, and the books of the establishment, which are secured at night in an iron or fire-proof safe. Almost every different business requires a different set of books, but the mode of keeping them is generally the same. The usual set of books comprises a day-book, in which sales or purchases on credit are individually entered as they occur; a leger, into which all these entries are engrossed in separate accounts; a journal or note-book, for entering miscellaneous transactions; a cash-book, in which every payment or receipt of money is regularly entered; a letter-book, into which all letters are copied before they are sent off; and a bill-book, for the entering of bills payable and receivable. In large concerns there are various other books, as foreign-leger, town-leger, country-leger, &c. The art of book-keeping is simple. It requires only a competent knowledge of arithmetic, and skill in penmanship, with a little training in the method of entering and posting accounts. The strictest care and accuracy are desirable. It is an understood rule, that no book should show a blot or erasure; a leaf, also, should never on any account be torn out, whatever blotch or error it contains. The reason for this scrupulous care is, that a merchant's books should be a clear and faithful mirror of his transactions, and an evidence of his integrity. In the case of misfortune in trade, or other circumstance, the books may be subjected to a rigid judicial examination, and the appearance of an erasure or torn-out leaf may lead to conjectures of an unpleasant nature and consequences. When an important error occurs in book-keeping, it is better to let it remain and write *error* below it, than to make a large erasure or to cut out the leaf.

From the books kept by a merchant, a condensed view of his affairs ought to be annually made up. This document contains an *inventory* or list of goods, money debts owing to the merchant, or other available property: also a contra list of all debts and other obligations due by the merchant. Both being balanced, the residue, whether for or against the merchant, is at once observable. Every man in trade, for at least his own satisfaction and government, should make up a *balance-sheet* of this nature annually.

Bill of Parcels.—An account or list of items of goods, given to their purchaser by the seller, or delivered along with the goods at the purchaser's house. Should a purchaser dispute the delivery of the goods, it is necessary to produce proof of the fact; when delivered to carriers, a receipt is usually given by subscribing a parcel book.

Invoice.—A bill or account of goods, which is forwarded separately, announcing the date of their despatch and the particular conveyance by which they are sent. If the seller fail to forward an invoice by post, and the goods be lost at sea while on their way, the purchaser is not answerable, for he is not supposed to know how or when the goods were sent, and therefore could not insure against their loss. The careful sending of invoices forms an important duty of a merchant's clerk.

Carriers.—Persons who undertake to convey goods from one place to another, whether by land or water, are carriers; and the carrying trade, as it is called, forms now a large and varied department of human industry. "Carriers are bound to receive and carry the goods of all persons, for a reasonable hire or reward; to take proper care of them in their passage; to deliver them safely, and in the same condition as they were received (excepting only such losses as may arise from *the act of God or the king's enemies*); or in default thereof, to make compensation to the owner for whatever loss or damage the goods may have received while in their custody, that might have been prevented. Hence a carrier is liable, though he be robbed of the goods, or they be taken from him by irresistible force. On the same prin

ciple, a carrier has been held accountable for goods accidentally consumed by fire while in his warehouse."* Violent storms, tempests, and lightning, are considered to be "the act of God," or such as no human precaution could have averted, and no fraudulent intention could have produced.

Bill of Lading.—A formal acknowledgment or receipt given by sailing masters for goods put on board their vessels, including a promise to deliver them safely as marked and addressed to their designed destination, always, however, excepting loss or injury by the act of God, the king's enemies, fire, or the dangers or accidents of the sea. This bill of lading is usually a printed form, filled up with writing, and concludes with the quaint and pious wish—"And so God send the good ship to her destined port in safety: Amen." A set of two bills of lading is furnished to the shipper of the goods, one of which he retains for his own satisfaction, and the other is forwarded by post, like an invoice, to the person to whom the goods are sent. When the ship arrives at its destined port, this document can be employed to cause the captain of the vessel to deliver the goods therein mentioned.

Debenture.—This is the name of a formal certificate employed to recover a certain amount of drawback of duties from the custom-house on goods exported. The exporter draws up and signs the certificate, the signature being attested by a magistrate; and being forwarded to the custom-house, it is compared with the return of the officer who has seen the goods packed and sealed. After a certain period has elapsed, the duties are paid to the exporter. The meaning of this transaction is, that on exporting goods, any king's duty that may have been imposed upon them is paid back to the exporter, so as to relieve the foreign or colonial receiver from the burden of using taxed commodities. It also acts as a bounty on exportation.

Customs—Excise.—The duties or taxes imposed upon goods entering or going out of the country are called *customs*, and those imposed upon goods at the period of their manufacture in the country, are called *excise duties*. Both form a prime element in the national revenue, and are levied by boards of customs and excise, each having an extensive ramification of subordinate functionaries, for the imposition and collection of the duties. A custom-house is established at every principal port. Nearly all customs and excise duties must be paid at the time the goods are passed through the hands of the officers of either department, and fall on the first instance on the merchant and manufacturer. They, however, enhance the price of the commodities, and are therefore ultimately paid by the consumer. For the accommodation of merchants, the custom-houses in the different chief ports possess large warehouses or depôts for goods, called *bonded warehouses*. Goods subject to duty may, on importation, be consigned to these depôts, where they are allowed to remain till the merchant finds it convenient to remove them and pay the accustomed duties. Until removed, therefore, the commodities in bond can hardly be said to be imported into the country, being in the condition of goods still lying in a foreign port.

Lloyd's.—Lloyd is not the designation of any individual or of any company: it is a name used in reference to a set of subscription rooms or coffee-house, in London. Formerly, the place of resort was in the Royal Exchange, but since the destruction of that building by fire, the place of meeting is in the neighbourhood of that locality. One of the rooms at Lloyd's is devoted to subscribers who follow the profession of marine insurers, technically called *underwriters*, from their writing under, or subscribing to, certain obligations in deeds presented for their acceptance. When a person wishes to insure a ship, or goods in a ship, against damage or loss at sea, he offers the risk to these underwriters, and they are at liberty to accept it for a specified premium. The policy or deed expressive of the insurance is usually signed by more than one underwriter, so as to divide the risk. Lloyd's is not only a centre point in the metropolis for all sea insurance business, but is the place to which every species of intelligence respecting shipping is forwarded from all parts of the world; and this information is exhibited publicly in one of the rooms, for the inspection of all. The intelligence is for the most part sent by appointed agents, one part of whose duty consists in investigating the cause of damage to vessels, and taking charge of wrecked property for behoof of the underwriters, whoever they may be. The lists made up and exhibited at Lloyd's furnish authentic information for the use of merchants and shippers of goods all over the united kingdom.

Vendue.—This is a colonial phrase, used instead of *public auction*. To sell goods at vendue is to dispose of them at auction. The place of sale is sometimes called "the Vendue."

Dutch Auction.—In common auction, the highest bidder by competition is the purchaser; but according to the process of sale called Dutch auction, there is a different mode of determining the successful bidder. According to this plan, the article is put up at a certain nominal price, which is gradually lowered, and the first who speaks and offers the sum mentioned by the auctioneer is at once knocked down as the purchaser. This is the fairest mode of auctioneering; it prevents competition, and the article brings its exact value—that which it is worth in the estimation of those present.

Official and declared Value.—All goods exported are entered in the custom-house books as of so much *official value*. The value is quite illusive as respects the real value of the articles. The official valuation is according to an estimate of the date 1694, without reference to the alteration of prices since that period. Knowing the fixed official price, we may be able to estimate the exact quantities, but this is a matter which few private individuals understand. The *declared value* is the price announced by the exporters of the goods, and amounts to nothing more than a rough estimate; it being necessary only to declare the value at something near the reality, for purposes of taxation, or making up reports of the export trade.

Insolvency, Bankruptcy.—When a person is not in circumstances to pay his debts in full, he is *insolvent*, which is nearly equivalent to being bankrupt; the term bankrupt, however, is more commonly applied to one who is legally announced or gazetted as being insolvent. The term bankrupt is derived from *bancus* a bench, and *ruptus* broken, in allusion to the benches formerly used by the money-dealers in Italy, which were broken in case of their failure to pay their debts. The law prescribes a certain form of procedure in the case of commercial insolvency, which has the effect of deliberately investigating the cause of the misfortune, and relieving the bankrupt from all obligations, on yielding up his entire property. Only persons in trade are entitled to the benefit of this bankrupt law, all others being excluded; so that, in the event of their insolvency, they must submit to the common laws respecting debtors, which are in some respects very rigorous. A bankrupt who has received a discharge or certificate from a competent authority, being released from all pecuniary claims, may again enter business for his own behoof without any fear of molestation; but a debtor who has merely taken the benefit of the Insolvent Act in England, or process of *Cessio Bonorum* in Scotland, though immediately relieved from prison and left at liberty to pursue any line of industry, the property he may accumulate is at all times liable to seizure by his former creditors.

* M'Culloch.

A commission of bankruptcy in Scotland is entitled a *sequestration*, meaning that the property of the bankrupt is officially sequestrated, or taken possession of, for behoof of creditors.

BRITISH COMMERCE.

British commerce is in two distinct branches—*inland*, or that which takes place within the country, and *export* and *import*, or that which pertains to foreign transactions. The inland trade conducted for home consumption is at least ten times the amount of the foreign trade. It is calculated that commodities are produced within the country annually to the value of *five hundred millions of pounds*, fully nine-tenths of which are sold from hand to hand, or accumulate as capital, while the remainder, or nearly one-tenth, is exported. All this is exclusive of the sale of imported foreign productions.

Comparatively small as is the foreign trade of the united kingdom, it employs a larger commercial marine than that of any other nation. In 1836, the united kingdom and its possessions in Europe owned 20,388 ships, with a burden of 2,[illegible]749 tons; the colonies at the same time owned 5[illegible]2 ships, with 442,897 tons; total 25,820 ships, with 2,[illegible]92,646 tons. All this is exclusive of ships of foreign proprietorship carrying on trade with the united kingdom.

Within a recent period, the manufactures and commerce of Scotland have wonderfully increased. The iron manufactures of Carron, and the cotton and silk manufactures of Glasgow and Paisley, are known all over the world. The sailcloth and coarse linen manufactures of Dundee, now one of the most flourishing ports in the empire, have greatly tended to the advancement of the Scottish export trade. The annual value of the Scottish manufactures was recently calculated to exceed £14,000,000. The tonnage of vessels on the Clyde is nearly as great as that of all Ireland, the tonnage of which, in 1828, only amounted to 97,379 tons—not one-third of the total tonnage of Scotland; the tonnage of Aberdeen is as great as that of Dublin and Belfast, the two principal Irish ports, put together. The Irish trade, however, is increasing, chiefly by means of steam navigation.

The most important commercial cities of England, besides London, are Liverpool, Bristol, and Hull; the most important manufacturing towns are Manchester, Birmingham, Leeds, Nottingham, Halifax, Rochdale, &c. In Scotland, the principal commercial places are Glasgow, Greenock, Leith, Dundee, and Aberdeen. The foreign trade of Glasgow and Greenock extends to the West Indies, the United States, the British American colonies, Brazil, and the whole continent of Europe. The foreign trade of Leith, Dundee, and Aberdeen, extends to the West Indies, America, the Mediterranean, and the Baltic. The greatest commercial cities of Ireland are Dublin, Cork, Wexford, Waterford, and Belfast. Nearly two-thirds of the traffic of Great Britain is carried on in London, and about one-sixth of the whole shipping of the empire belongs to that port. London is likewise the centre point for the negotiation of all the [illegible] commercial and pecuniary transactions in the united kingdom.

Both the export and import trade of the united kingdom have been steadily increasing for a number of years, in proportion as restrictions have become less harassing, as duties have been remitted, and as population has advanced. Not counting odd thousands, the following presents a view of this increase:—In 1800, the official value of the exports from Great Britain, of British manufactures and Irish produce, was twenty-two millions; in 1810, thirty millions; in 1821, thirty-seven millions; in 1828, fifty-one millions; and in 1830, fifty-five millions. This is not estimating the export of foreign and colonial produce, or exports from Ireland. The value of imports into Great Britain rose in a similar manner, from twenty-four millions in 1800, to forty-two millions in 1830.

Since this period, the foreign trade of the country has undergone some changes. A return to parliament published in March, 1840, shows the state of our foreign and domestic interests in the years 1838 and 1839. In the former year, the declared value of British and Irish produce and manufactures exported amounted to £43,344,631, and in 1839 to £45,281,254. There has been an increase in the exportation of cotton, linen, woollen, and silk goods, and woollen yarn; also in hardwares and cutlery, iron and steel, and other metals, and earthenware; and a falling off in coal, salt, cotton yarn, linen yarn, wool, and refined sugars. The following is an abstract of the annual accounts, showing the official value of goods exported in 1838 and 1839.

	1838.	1839.
Coals and culm,	£485,950	£543,156
Cotton manufactures,	16,715,857	17,694,303
Cotton yarn,	7,431,869	6,857,826
Earthenware,	651,344	768,496
Glass,	377,283	371,270
Hardwares, and cutlery,	1,498,327	1,819,000
Linen manufactures,	2,730,270	3,422,488
Linen yarn,	836,163	814,607
Metals, viz. iron and steel,	2,635,692	2,702,738
copper and brass,	1,221,732	1,293,977
lead,	154,126	595,640
tin, in bars, &c.,	101,846	112,620
tin plates,	436,577	345,442
Salt,	223,456	219,069
Silk manufactures,	777,280	865,768
Sugar refined,	553,247	213,738
Wool, sheep or lamb',	434,006	361,829
Woollen yarn,	384,535	401,188
Woollen manufactures,	5,795,069	6,278,[illegible]30
Total,	£43,344,631	£45,281,254

The gross amount of customs' duties inwards in 1838 was £22,966,214, and in 1839, £23,278,089. The gross amount of excise duties for the year ending October 1838 was £11,827,788, and for the year ending October 1839, it was £12,152,171; thus the custom and excise duties produce annually upwards of *thirty-four millions of pounds* to the national revenue.

MONEY.

Origin and Nature of Money.—In a rude state of society, exchanges are made by bartering one article for another, according to some kind of understood value. "But when the division of labour first began to take place (says Smith), this power of exchanging must frequently have been very much clogged and embarrassed in its operations. One man, we shall suppose, has more of a certain commodity than he himself has occasion for, while another has less. The former, consequently, would be glad to dispose of, and the latter to purchase, a part of this superfluity. But, if this latter should chance to have nothing that the former stands in need of, no exchange can be made between them. The butcher has more meat in his shop than he himself can consume, and the brewer and the baker would each of them be willing to purchase a part of it; but they have nothing to offer in exchange, except the different productions of their respective trades, and the butcher is already provided with all the bread and beer which he has immediate occasion for. No exchange can, in this case, be made between them. He cannot be their merchant, nor they his customers; and they are all of them thus mutually less serviceable to one another. In order to avoid the inconveniency of such situations, every prudent man, in

every period of society, after the first establishment of the division of labour, must naturally have endeavoured to manage his affairs in such a manner as to have at all times by him, besides the peculiar produce of his own industry, a certain quantity of some one commodity or other, such as he imagined few people would be likely to refuse in exchange for the produce of their industry.

"Many different commodities, it is probable, were successively both thought of and employed for this purpose. In the rude ages of society, cattle are said to have been the common instrument of commerce; and though they must have been a most inconvenient one, yet in old times we find things were frequently valued according to the number of cattle which had been given in exchange for them. The armour of Diomede, says Homer, cost only nine oxen; but that of Glaucus cost a hundred oxen. Salt is said to be the common instrument of commerce and exchanges in Abyssinia; a species of shells in some parts of the coast of India; dried cod at Newfoundland; tobacco in Virginia; sugar in some of our West India colonies; hides or dressed leather in some other countries; and there is at this day a village in Scotland where it is not uncommon, I am told, for a workman to carry nails, instead of money, to the baker's shop or the alehouse.

"In all countries, however, men seem at last to have been determined by irresistible reasons to give the preference, for this employment, to metals above every other commodity. Metals cannot only be kept with as little loss as any other commodity, scarce any thing being less perishable than they are, but they can likewise, without any loss, be divided into any number of parts, as by fusion those parts can easily be re-united again; a quality which no other equally durable commodities possess, and which, more than any other quality, renders them fit to be the instruments of commerce and circulation. The man who wanted to buy salt, for example, and had nothing but cattle to give in exchange for it, must have been obliged to buy salt to the value of a whole ox or a whole sheep at a time. He could seldom buy less than this, because what he was to give for it could seldom be divided without loss; and if he had a mind to buy more, he must, for the same reasons, have been obliged to buy double or triple the quantity, the value, to wit, of two or three oxen, or of two or three sheep. If, on the contrary, instead of sheep or oxen, he had metals to give in exchange for it, he could easily proportion the quantity of the metal to the precise quantity of the commodity which he had immediate occasion for.

"Different metals have been made use of by different nations for this purpose. Iron was the common instrument of commerce among the ancient Spartans; copper among the ancient Romans; and gold and silver among all rich and commercial nations.

"Those metals seem originally to have been made use of for this purpose in rude bars, without any stamp or coinage. Thus we are told by Pliny, upon the authority of Timæus, an ancient historian, that, till the time of Servius Tullius, the Romans had no coined money, but made use of unstamped bars of copper to purchase whatever they had occasion for. These rude bars, therefore, performed at this time the function of money.

"The use of metals in this rude state was attended with two very considerable inconveniences; first, with the trouble of weighing, and secondly, with that of assaying them. In the precious metals, where a small difference in the quantity makes a great difference in the value, even the business of weighing, with proper exactness, requires at least very accurate weights and scales. The weighing of gold, in particular, is an operation of some nicety. In the coarser metals, indeed, where a small error would be of little consequence, less accuracy would, no doubt, be necessary. Yet we should find it excessively troublesome, if, every time a poor man had occasion either to buy or sell a farthing's worth of goods, he was obliged to weigh the farthing. The operation of assaying is still more difficult, still more tedious, and, unless a part of the metal is fairly melted in the crucible, with proper dissolvents, any conclusion that can be drawn from it is extremely uncertain. Before the institution of coined money, however, unless they went through this tedious and difficult operation, people must always have been liable to the grossest frauds and impositions; and, instead of a pound weight of pure silver, or pure copper, might receive in exchange for their goods an adulterated composition of the coarsest and cheapest materials, which had, however, in their outward appearance, been made to resemble those metals. To prevent such abuses, to facilitate exchanges, and thereby to encourage all sorts of industry and commerce, it has been found necessary, in all countries that have made any considerable advances toward improvement, to affix a public stamp upon certain quantities of such particular metals as were in those countries commonly made use of to purchase goods. Hence the origin of *coined money*, and of those public offices called mints; institutions exactly of the same nature with those of the aulnagers and stampmasters of woollen and linen cloth. All of them are equally meant to ascertain, by means of a public stamp, the quantity and uniform goodness of those different commodities when brought to market."*

It will be understood from these explanations that money is only an article which can be conveniently used in exchanging. In itself, or as relates to its own intrinsic qualities, it is a thing but of small value. Gold and silver, or the precious metals, of which money is usually made, are chiefly brought from the mines of South America, and are commercially valued according to the cost of their production and their supply and demand, as is the case with every other object in trade. If an overabundance of any of these metals be easily obtained, and the demand be not increased, the value is immediately lowered; and if the supply is obtained with difficulty, while the demand remains steady or is increased, the value is heightened. It cannot be too strongly impressed on the mind of the reader, that money is but a metallic representative of something which has been given for it. To a misunderstanding regarding this apparently very simple circumstance, much human misery may be attributed. It has too often been the feeling of communities, that if they possessed gold they possessed riches, and not a mere article for facilitating commerce—an article which, from its uses in this respect, is itself a commodity. The most startling illustration of this fallacy is to be found in the history of Spain. Before the working of the gold mines in their American possessions, the Spaniards were a rich and prosperous commercial people; but when they began to find gold, they thought they had got at their hand that for which they formerly laboured, and that, like a poor industrious man who has unexpectedly succeeded to an estate, they need now work no longer. To prevent their riches from disappearing, the law prohibited the exportation of the precious metals, and thus effectually shut the door against the only way in which they could be made sources of wealth—exportation as an article of commerce. In that view, and in that alone, was there any advantage in the possession of gold; and even had it been employed in the most advantageous manner, it would not have been so profitable as many other means of employing capital and labour; for as already remarked, the peculiarity which makes gold so useful as a measure of value, is, that the labour expended in producing it bears so constant a ratio to the quantity realized, that but small profits are made from its production.

The manner in which the Spaniards became acquainted

* Smith's Wealth of Nations, book i. chap. 4.

with the treasures of South America tended to nourish the hallucination. They found a considerable quantity of gold in the possession of the natives, which they speedily seized. They found also native gold in the streams. Thus, by an accidental circumstance, such as that of finding a hidden treasure, they became possessed of money without working for it. They did not reflect that, if this lasted, gold would cease to be the representative of value which it was, and would be of no further service in commerce than as an extremely beautiful material for manufactures, which would fluctuate in value with the tide of fashion. When they could procure the mineral only by the result of hard labour, they still had the same preposterous feeling that they were possessed, not of the means of making wealth, but of wealth itself, and dearly did they pay the penalty. While starvation desolated the land, and the highest grandees could not command so much of the produce of ordinary commercial industry as a glass window, every wretched dwelling glittered with mountains of plate.

Gold, it is necessary to repeat, is simply a commodity—a commodity which we import: and if we can export it profitably, why not do so? If the country in question will take nothing from us but gold, then it is either worth our while to buy gold for the purpose of sending to it, or it is not. If it is not worth while, then the trade will not be carried on at all. If it is worth while, then the trade is on the whole a profitable one. If we import sugar from the Spanish settlement of Manilla, and export it to Germany, this is called "the carrying trade," and quite correctly; but it seems to be thought that if we import gold from South America, we must keep our hands upon it, otherwise we shall be ruined. It is commonly said that we can only establish a profitable trade when we pay in our own manufactures. Now, paying in gold is, after all, indirectly paying with our own manufactures, for (except the comparatively trifling quantity that may have been taken in war) there is not an ounce of bullion in the country that has not been obtained in exchange for some article produced either by our manufacturing or agricultural industry. Let him who doubts this position try if he can discover any other method by which gold can have found its way to this country.

Coined Money.—Gold and silver, as we have said, are chiefly brought from the mines of South America. They are generally imported in the form of bars, and in this rude state are commercially named *bullion*. The price of bullion in the market is liable to fluctuations, according to the cost of production, the supply, and the demand. However, this variation is never very great, and has little sensible effect on the coinage. It is customary to estimate the purity of gold by an imaginary standard of 24 carats.* If in a piece of gold weighing 24 carats there be 1-24th of alloy, then the piece is one below the standard. What is called jewellers' gold is seldom purer than 20 fine to 4 of alloy—the alloy being usually silver, but sometimes copper, which gives a deeper red tinge to the metal. Perfectly pure gold is never seen either in trinkets or coins, for it is too ductile, and for that and other reasons requires a certain quantity of alloy. Sovereigns, and other modern English gold coins, contain one-twelfth of alloy, but this twelfth is not reckoned as gold, in point of value. At present the gold coin of Great Britain is issued at very nearly its precise market value as bullion. A pound weight of gold, of 22 carats' fineness, produces coins to the amount of £46, 14s. 6d., which is about the price at which bullion sells for in the market. Thus the gold of our currency is coined free of expense. In coining silver, government is allowed, by the act of 56 Geo. III., a profit or seignorage of about six per cent.; the pound weight of silver, which should produce 62 shillings, being coined into 66 shillings. Our silver coins being therefore of a little less real value than the sums they represent, they are not liable to be melted down by silversmiths for the manufacture of articles in their trade.

Till the year 1816, on the occasion of a new coinage, the silver shilling was the standard of money, though, for convenience, the pound of twenty shillings was the principal sum named in commercial transactions. The act 56 Geo. III. rendered gold the principal standard, and made silver subsidiary to it; since which period, no more than forty shillings are a legal tender, that is to say, no one is bound to accept of more than forty shillings in silver in payment of any debt or demand. The legal tender, above forty shillings, is in sovereigns; but in point of fact an order on the Bank of England is considered equivalent.

The copper coinage, consisting of pennies, half-pence, and farthings, is issued from the mint at the rate of £224 per ton, being more than 100 per cent. above its market value; in other words, a penny piece is intrinsically worth no more than a halfpenny. Formerly, the pieces usually known as old pennies were larger; but, in consequence of a rise in the value of copper in 1806, it has since been thought advisable to adopt the rate above mentioned. Between 1815 and 1836, there was an issue of copper money to the value of £186,107, 4s.

The coined money of Great Britain is the most elegantly executed, and among the purest in the world. The greater part of the continental coinage is poorly executed and basely alloyed. In Holland, and most of the German states, the coins legally current as silver money are apparently one-third brass, and resemble the counterfeit shillings and sixpences of a former period in England. In France and Belgium, the new gold and silver coins are handsome, and so likewise are the large gold and silver pieces of Prussia. The coins and medals executed by direction of Napoleon in France are in a high style of art.

Money of the current and standard coinage is frequently signified by the term *sterling*, as "one pound sterling," &c. With respect to the origin of the word sterling, there are three opinions. The first is, that it is derived from Sterling Castle, and that Edward I. having penetrated so far into Scotland, caused a coin to be struck there, which he called Sterling. The second opinion derives it from the figure of a bird called starling, which appears about the cross in the ancient arms of England. The third most probably assigns its true origin, by deducing it from Esterling; for in the time of Henry III. it is called *Moneta Esterlingorum*, the money of the Esterlings or people of the East, who came hither to refine the silver of which it was made, and hence it was valued more than any other coin, on account of the purity of its substance. The denomination of the weights and their parts is of the Saxon or Esterling tongue, as pound, shilling, penny, and farthing, which are so called in their language to the present day. The term sterling is now disused in England in all ordinary transactions, but is still used in Scotland to distinguish sums from the ancient money of the country, as referred to in old deeds and notices of pecuniary transactions. The old Scots money, previous to the Union of 1707, was in pounds, shillings, and pence, but these were only a twelfth of the value of sterling money of the same denomination; thus, a pound Scots was only twenty pence sterling. The word sterling is also in use in the colonies, to distinguish the legal standard of Great Britain from the currency money in these places.

The following is a short explanation of the origin of the principal terms used in reference to coined money. The word *money* is from the temple of Juno *Moneta*, in which money was first coined by the ancients. *Pecuniary* is from *pecus*, cattle—flocks and herds of an-

* The carat is a small weight of universal use, containing four grains. It originated from the carat-bean, a small bean used by the Abyssinians for weighing gold. Diamonds are also weighed by it.

main being originally equivalent to money, or things constituting wealth. *Cash*, in commerce, signifies ready money, or actual coin paid on the instant, and is from the French word *caisse*, a coffer or chest in which money is kept. *Pound* never was a coin; the term was originally employed to signify a pound weight of silver, but afterwards it was applied to mean twenty shillings in tale, or by counting. *Guinea* took its name from the coast of Guinea in Africa, whence the gold for it was originally brought; at first, the piece was current at twenty shillings, afterwards it was equal to 21s. 6d., and finally settled at 21s. In the present day the guinea is not coined, and the term only remains to indicate 21s. Honorary fees and gifts are still usually reckoned in guineas, though paid in other money. *Shilling* and *penny* are both from Saxon words; the penny was first coined in silver. *Groat* was a name given to silver pieces equal to four pennies in value, coined by Edward III.; the word groats is a corruption of *grosses* or great pieces, and was given to distinguish this larger coinage from pennies or small coins. *Farthing* is a corruption of *fourthing*, or the fourth part of a penny.

A currency of coined gold is the most secure and permanent, and the pieces are received for their proper value in all countries. But notwithstanding these advantages, a metallic currency alone is quite unsuitable in highly commercial communities. There is no adequate importation of the precious metals, at the ordinary value, to supply material for a purely metallic currency; and if it were possible to provide a sufficient supply, the inconvenience and risk of loss to individuals from using coins only in all mercantile transactions, would be too great to be patiently borne. A heavy loss would also be incurred annually by government from tear and wear, which it would be impolitic to avert by imposing a proportionate seignorage. In these and other points of view, a currency of metal only would be exceedingly unsuitable to the existing condition of society and commerce in Britain. Something else requires to be employed as a medium of exchange and representative of the enormous sums which are daily transferred from one to another all over the country.

Paper Money.—The deficiencies of a metallic currency are compensated by the use of paper money. Paper money is in the form of small pieces of paper, each purporting to be an obligation or promise to pay a certain sum which is specified upon it. Whether passing by the name of a bank-note, a promissory-note, or bill of exchange, the principle on which it is issued is the same—an express obligation on the issuer to pay the specified sum in coined money on demand, or at a certain date which is mentioned. The notes of this kind issued by a bank pass from hand to hand, any holder having it in his power at any time to demand fulfilment of the obligation from the bank; but in the case of a bill of exchange, which is a promise by a private party, it is presentable for payment only at a specified period.

Bank-notes and bills together constitute the paper currency of the country, and are of prodigious use in carrying on commercial transactions. It is calculated that while the metallic currency seldom exceeds three millions, the paper currency, or amount of negotiable paper in circulation, is perhaps two hundred millions: of bank-notes alone, the circulation in the united kingdom may be reckoned to be sixty millions.

Bills of Exchange were first used for the purpose of settling pecuniary transactions between individuals at a distance from each other, and were therefore convenient expedients to avoid the risk of sending actual money to a creditor. This may be explained as follows:—If A, a merchant in London, have a debtor B and a creditor C, both in Paris, instead of sending money to C, and getting money sent to him by B, he may give C an order on B to pay the debt over at once to him. This is a bill of exchange in its simplest form. Suppose, however, that A has a creditor in Paris, but no debtor, while his neighbour E has a debtor, but no creditor: A may pay the money to E which the French debtor owes him, and obtain from him an order on his debtor to pay A's French creditor. This order he will be said to purchase. It will be an accommodation to him or to the other party, according to circumstances. In the complicated arrangements of modern commerce, the individual debtors and creditors are lost sight of. If a person has a sum to transmit to another country by such an order, the rate at which he will obtain it will depend on the pecuniary relations of the two places taken in the main. If there is more money payable at the moment by people in London to people in Paris, than there is payable by those in Paris to those in London, there will be a demand for orders on Paris, and a premium will be payable for the accommodation by those who want them. In this case, the *exchange* will be said to be against London. In Paris, on the other hand, there will be more people ready to give such drafts than there are in want of them, and those who dispose of them must do so at a discount. The rate of exchange is from this circumstance said to be in favour of Paris. The premium in the one case, and the discount in the other, will be measured by the balance due by London to Paris over what is due by Paris to London; and the principal sum to be met by the rate of exchange will be the expense of transmitting that balance in specie, unless the accounts can be adjusted by bringing transactions with some other community into the circle.

We may very this explanation of the principle of exchange as follows:—Great Britain, like every other country, is exposed to a drainage of its metallic currency, by the balance of trade falling against it. As long as our exports are equal to our imports they will balance each other; the bills drawn in England against foreign countries will be balanced by bills drawn in foreign countries against England. In this state of things, the exchange is said to be at *par*, or even. If our exports exceed our imports, then foreigners must send actual money for the overplus, because they have not occasion to remit bills for the amount. If our imports exceed our exports, we must, in the same manner, remit the overplus in actual money. Thus, a dearth and scarcity of corn in England will cause a drainage of the precious metals, because our imports of that article rise to a large amount, or much beyond the value of goods exported. The exchange is then said to be against England.

The multifarious transactions taking place between merchants in Britain and America, cause an incessant process of payment by the intervention of bills of exchange, many thousands of pounds being paid away daily in their accounts with each other without the aid of any metallic money, except a few coins for small odd sums.

Here is a common form of drawing a bill of exchange:—

£100. London, 5th August, 1840.

Three months after date, pay to me or my order the sum of one hundred pounds, value received.

To Mr. Thomas Styles, Merchant, John Nokes.
Cripplegate, London.

The bill being drawn in this form, Mr. Styles *accepts* it, by writing his name either below that of Mr. Nokes, or across the face of the writing. Mr. Nokes, who is called the *drawer*, now endorses the bill, by writing his name on the back of it, and thus the bill becomes *negotiable paper*. It may be paid away to a third party; and he endorsing it below Nokes' name, may pay it away to a fourth; and he endorsing it in the same manner may pay it away to a fifth; and so on. Thus the bill may pass from hand to hand, on each occasion liquidating a

debt of £100, till the day of payment by the original acceptor arrives, when it is duly presented by the last holder. Instead of running this course, the bill may at any period be *discounted* by a bill-broker or banker. The discounting of a bill consists in giving the money for it, less a certain sum for *interest*. Interest is a charge for the loan of money, and is ordinarily reckoned by *per cent.* Thus five per cent. (or centum) per annum, signifies a charge of £5 for every £100 for one year, which is equal to a shilling for each pound. Five per cent. is the highest legal interest chargeable in the united kingdom on all money lent in ordinary circumstances; but for discounting bills or promissory notes, a larger per centage may now be legally taken. When a bill for £100 for three months (or fourth part of a year) is discounted at five per cent. interest, a charge equal to the fourth part of £5 is made by the discounter, and this is his profit for the loan of the money for that period. Interest for a single day on any sum may be easily calculated by a rule in arithmetic; but merchants and bankers, for the sake of expedition and correctness, generally consult a set of printed interest tables.

According to a practice of old standing, bills are not presentable for payment till the third day after that which is specified for them to fall due. The three days allowed are called the *days of grace*. Thus, a bill drawn on the 5th of August, at three months, is not legally due till noon of the 8th of November. In some countries the period of grace is much longer than three days.

Bills of exchange are occasionally drawn in the form of promissory-notes; as, for example:—

£100. London, 5th August 1840.

Three months after date, I promise to pay to Mr. John Nokes, or order, the sum of one hundred pounds, value received. THOMAS STYLES.

When in this form, no signature is written across the front of the document—it is only endorsed by the creditor. Promissory-notes are in every respect liable to the same regulations as bills. Both promissory-notes and bills must be written on stamps of the proper price; if on stamps of an inferior value they are not negotiable, and cannot be protested. The protesting of a bill is simply the marking of a notary-public that it has not been duly paid on presentation; which marking, or *noting*, forms the warrant for the issuing of legal diligence by the competent authorities. If not protested on the day it has fallen due, this step cannot be taken afterwards, and the bill remains a mere evidence of the debt, to be produced in the course of a regular and perhaps tedious prosecution. Men in business are careful to present their bills for payment on the exact day they become due. When the acceptor of a bill fails to pay the amount, the holder can fall back for payment on any of the endorsers or the drawer.

Bills are sometimes drawn at *sight*, or so many days after sight; for example:—

£50. London, 5th August, 1840.

Ten days after sight, pay me or my order the sum of fifty pounds, value received.

To Mr. ISAAC WALTERS, Cheapside. JOHN JENKINS.

A bill of this kind is usually drawn by a person at a distance from his debtor, and on writing it out and endorsing it, he transmits it to an agent (or probably a creditor of his own) in the town in which the debtor resides. The agent having received it, hastens with it to the debtor to be *sighted*, which consists in the debtor, as for instance the above Mr. Walters, accepting it by signing his name and marking the day on which he has done so. The bill is now a negotiable instrument, and on the third day after the day specified, it is presentable for payment. This may be called a convenient way of getting ready money or prompt payment of any sum from a debtor. It is very common to draw foreign bills of exchange at so many days after sight. These bills are of precisely the same nature as inland or home bills of exchange; but, for the sake of security in transmission, they are drawn in sets of three. The following is a common form:—

£100. Montreal, 18th June, 1840.

Sixty days after sight, pay this my first bill of exchange (second and third of the same tenor being unpaid), for the sum of one hundred pounds sterling, value received. SAMUEL ROBERTSON.

To Messrs. BROWN and JONES, Merchants, Bristol.

This bill, being endorsed by Mr. Robertson, is transmitted to England (probably in liquidation of a debt of the same amount), and is presented to Messrs. Brown and Jones to be sighted, and is afterwards presented to them for payment accordingly. The agent or individual to whom it is sent, receives by the next packet the second bill of the same tenor. Should the first have been lost by shipwreck, this second is available, but otherwise it is of no use, and may be destroyed. The third bill of the same tenor is retained by the drawer till he learn whether the first or second have been received; if both have been lost, it is transmitted. Bills of this description are rarely sent by one actual drawer. They are usually paid away or sold on the spot to another party, who transmits them to a correspondent of his own, and he negotiates the payment.

Bills of exchange serve three useful purposes in commerce. 1. A bill puts a debt in a tangible form: for example, instead of leaving a debt of £100 to be paid at an indefinite period, so as to protract its settlement, let it be put in the shape of a promise to pay, and the creditor becomes satisfied that he now possesses the power to compel payment at a certain and not very distant period. 2. A bill is a negotiable instrument. If the parties be trustworthy, it may be discounted for cash; and thus, while the creditor will receive his money, less a trifle for discount, the debtor is left unmolested till the final day of payment. 3. A bill is a convenient representative of money, which may be sent from place to place in a letter, and if accidentally lost, its payment may be stopped and a new bill forwarded to its destination.

BANKS.

Origin of Banks.—The term *bank*, in reference to commerce, signifies a place of deposit of money, and is derived from the Italian word *banco*, a seat or bench, the first custodiers and dealers in money in Italy having been Jews, who sat on benches in the market-places of the principal towns. It is worthy of remark, that in the infancy of almost all modern civilized nations, the earliest money-dealers were Jews, and in the present day persons of that nation are the chief commercial negotiators in barbarous countries. Their acute intelligence, patient industry, and disregard of local attachments, have in all ages fitted the Jewish people for this course of life.

About the reign of Charles I., Jews and goldsmiths, to whom valuable property had been assigned for safe custody, began to exercise the profession of bankers in England; but till a much later period there were several eminent bankers in London who still kept goldsmiths' shops.

On the continent of Europe regular banking commenced much earlier than in this country. The Bank of Venice was established as early as 1171, the Bank of Amsterdam was began in 1609, and that of Hamburgh in 1619. Regular banking establishments were formed in England and Scotland shortly after the Revolution. The Bank of England began in 1694, and the Bank of

Scotland in 1695, since which period banks have been instituted in all the principal towns in the united kingdom.

Business of Banking.—A bank is a commercial institution, established and conducted by private individuals for their own behoof, or by joint companies. Like a merchant's counting-house, it consists of various officials—a manager, cashier, clerks, &c., including tellers, or persons for receiving and paying out the money. Banks are usually reckoned to be of two kinds—banks of *deposit* and banks of *issue*. By deposit it is meant that the bank takes charge of deposits of cash, which it is ready to restore on demand. Some banks of this nature allow interest on the sums received, and others do not do so; all, however, of necessity, make use of the money so deposited, by lending it out at a certain rate of interest, and thus compensate themselves for their trouble. The loans are most commonly in the form of discounts of bills, and occasionally advances on heritable property, or other securities. Banks of issue transact all the ordinary business of banks of deposit, and in addition issue notes of their own instead of actual cash or the notes of others. Almost all banks in this country are banks both of deposit and issue; they at least issue notes as far as the law allows them, which is to the extent of notes of £5 in value and upwards. The only banks permitted to issue below £5 are those in Scotland, for which a peculiar law exists.

Although banks are thus at liberty to issue notes to any extent, it is not to be supposed that they do so without a certain degree of restraint. The expense of manufacturing notes, notwithstanding that each requires a stamp, is a comparatively small check; the main restraint on over-issuing consists in the obligation to pay the sum which the note expresses, on demand. When, therefore, a banker discounts a bill for £100, and gives out one hundred notes of one pound each, he encounters the risk of having these notes returned upon him, and a demand made for them in cash within the compass of a day or two thereafter. This risk is increased by the practice among bankers of never issuing the notes of others. They are anxious enough to push forth on a safe principle their own paper, but when they receive deposits or payments in the paper of another bank, they use all convenient speed in demanding cash from that bank in exchange for its notes. The notes of any given bank being received purely on a principle of good faith or credit, it is of great importance that the bank should do nothing to incur the suspicion of being incapable of retiring its notes. When any suspicion of this nature arises, the public, who are ignorant probably of the true circumstances, rush to the bank for gold in exchange for its notes. This kind of panic is called a *run*. Bankers are always naturally anxious to issue their notes to as great an extent as is consistent with safety to the institution. The measure of this safety is the extent of capital at command to liquidate demands for cash. To accommodate the amount of this capital to the probable necessities of the case, is the point in banking for which the greatest skill is required, because if much capital is kept lying useless in the coffers of the bank, there is a loss of interest which may be ruinous, whereas, if too little is retained, a sudden run might utterly destroy the credit of the concern. When banking is managed with prudence, there is a certain amount of money kept at interest in the funds or government securities, upon which, if need be, an order is given. Thus a safety fund is established, whereon to fall back in case of emergency. A share of the subscribed and paid-in capital of the shareholders of the bank forms this safety fund, and it may be taken as a general rule, that where a bank is provided with no such security, but issues notes on the faith of the fund it may chance to have in hand, then the bank is trading on a principle alike dangerous to itself and the public. A banker who unites enterprise with prudence takes every available means to extend the circulation of his notes in as minute and distant channels as possible; for as long as a note is out, an interest is being received for the capital which it represents. In other words, when a pound note is out, it represents a sovereign which has been deposited or given for it, and which sovereign is employed in a fund in some manner of way at interest, for the advantage of the banker.

On considering the various operations connected with banking, it will be found, that, independently of the impulse and elasticity created by the facilities given to commerce, the direct and primary effect of them is the employment of waste money. A bank gathers, as it were, the money of a district into its hands, and, allowing each man to use as much of his own share as he requires at the time, keeps the remainder likewise in employment, which it would not have been had it remained in its owner's hands.

The rapidity with which all kinds of payments are made, and therefore the frequency with which money can be used, through the instrumentality of banks, form their most striking feature. In a bank office the same sum of money will have been made the means of paying its amount a dozen of times over in a day without being once uplifted. A, who is due B £100, gives a check for the sum, which will make it stand in his name instead of A's. B gives a similar check to C; C to D; and so on. "The transfer of lodgments," says Mr. Gilbert, "is extensively practised in our own times. If two persons, who have an account in the same bank, have business transactions with each other, the debtor will pay the creditor by a check upon the bank. The creditor will have this check placed to his credit. The amount of money in the bank remains the same; but a certain portion is transferred into a different name in the banker's books. The check given by the debtor is an authority from the debtor to the banker to make this transfer. Here the payment between the creditor and debtor is made without any employment of money. No money passes by one to the other: no money is paid out or received by the banker. Thus it is that banks of deposit economize the use of the circulating medium, and enable a large amount of transactions to be settled with a small amount of money. The money thus liberated is employed by the banker in making advances, by discount or otherwise, to his customers. Hence the principle of transfers gives additional efficacy to the deposit system, and increases the productive capital of the country. It matters not whether the two parties, who have dealings with each other, keep their accounts with the same banker or with different bankers, for as the banks exchange their checks with each other at the clearing-house, the effect, as regards the public, is the same."*

London, in which the government funds are managed, and where all the great pecuniary transactions of the empire may be said to centre, furnishes a remarkable instance of the economizing of money by the interchange of checks or drafts among bankers. Each banking-house in the metropolis sends daily the drafts it has received on other banking institutions to a place of common resort, called the clearing-house. Here a clerk from each bank attends and exchanges drafts. It is understood that the accounts balanced every day at this clearing-house amount to eight millions sterling, the settlement being effected by the intervention of only about £250,000 in notes and cash.

Bank of England.—This institution, which is the largest and most important banking establishment in the world, was projected by William Paterson, a Scotchman, and received its charter of incorporation July 27, 1694. It was constituted as a joint-stock association, with a

* History and Principles of Banking, pp. 123, 124.

capital of £1,200,000, which sum was lent at interest to the government of William and Mary, at the time in a state of embarrassment. At its very outset, therefore, the Bank of England was a mere engine of government; and in a lesser or greater degree it has enjoyed this character through all the stages of its subsequent history. According to its charter, the management is committed to a governor, lieutenant-governor, and twenty-four directors, elected by stockholders who have held £500 of stock for six months previous to the election. A director is required to hold £2000, a deputy-governor £3000, a governor £4000 of the capital stock. At first the charter of the bank was for only eleven years; but in consequence of the great services of the institution to government, its charter has been at various times renewed. The original stock of £1,200,000 has been augmented at different times, till, in 1816, it reached £14,553,000, upon which the stockholders drew dividends. The profits of the bank arise from traffic in bullion, discounting of bills, interest on mortgages, allowance for managing the public debt, &c.

The net profit of the bank in 1832, out of which interest was paid on the capital stock, was £1,189,627. The interest paid to stockholders has wavered from five to ten per cent. per annum, but has more generally been about eight per cent. The bank has, besides, at different times, made dividends under the name of *bonuses*. A bonus is a sum of money derived from the division of a fund, which had been suffered to accumulate or remain for use, in case of an emergency. The emergency being past, the fund is divided. The bonuses of the Bank of England have varied from ten to five per cent.

Originally, the business of the Bank of England was conducted at Grocers' Hall, in the Poultry; but about a century ago it was removed to a new edifice near the Royal Exchange, which may be described as the centre of the great business district of London. With numerous extensions, the bank structures cover an area of about eight acres of ground. The principal entrance is by Threadneedle Street, a thoroughfare immediately to the north of the Royal Exchange. Within the limits of the bank are conducted, on an extensive and perfect scale of art, the various processes of printing notes and other documents for the establishment; and in the fire-proof vaults beneath is the repository of bullion, or bars of gold and silver and coined money, constituting the substantial stock of capital for the time being. The number of clerks, porters, and other officials employed in the establishment, was lately about 900.

The Bank of England trades not only on its paid-up capital, but on the capital confided to it in the form of deposits, and usually called its liabilities. This is perfectly legitimate, and consistent with the true principles of banking, it being only necessary to take care that the institution always leaves itself a sufficient fund from which to satisfy all demands. The issue of notes by the bank is understood to be somewhat in accordance with the amount of its deposits; but this is necessarily dependent on various contingencies in public affairs. The leading feature in the character of the institution is the circumstance of its acting as the banking-house for the government. All the money drawn in the form of taxes or otherwise for the public service is consigned to the bank, while all drafts for the public service are likewise made from it. In carrying on this branch of its business, the bank allows the government to overdraw its account, that is, to take a loan of cash to a certain amount. The money so lent was some time ago upwards of £14,000,000, which parliament made a provision to reduce and finally pay off. The important services rendered to the government have in past times secured to the bank most valuable privileges, amounting almost to a monopoly of the business in money. In 1797, when the bank found itself unable to meet a run made upon it for gold for its notes, the government of that day summarily protected it from bankruptcy by issuing an order that Bank of England notes should be considered a legal tender; consequently, the holders of notes at the time were, by force of law, refused their value in cash. This extraordinary state of affairs, with various modifications, lasted till 1821, when cash payments were resumed. Meanwhile, the notes of the bank, from not being representatives of specie, were considerably depreciated in nominal value; so great was the depreciation at one time, that four pound notes would have been given in exchange for three guineas. It has been frequently represented as a serious hardship, that debts contracted during this prevalence of a depreciated currency, have had to be paid in a currency of full value; for by this means the creditor receives perhaps a third more money than the actual value of the original sum owing.

Joint-Stock Banks in England.—A parliamentary return was published early in 1840, relative to these establishments, from which it appeared that the number of joint-stocks in England, at 1st January, 1840, was 108, a considerable proportion of which had been instituted within the preceding ten years.

The number of partners in these banks varies from 50 to 1200, and may average about 300. There are half-a-dozen with less than fifty partners, the smallest number being seven. Fifty-eight of the banks have branches, and fifty have none. The branches, including the parent bank, are from two to sixty-seven in number. There are eight banks which have more than twenty branches. The whole number of parent banks and branches is 658.

There are besides about 550 *private banks* in England, that is, banks having not more than six partners. Adding these to the joint-stock banks and their branches, the whole number of banking establishments will be about 1200.

The issues of the joint-stock banks, when contrasted with the magnitude of the establishments, seem to us exceedingly small. According to the last return (August 2, 1839), the notes in circulation of all the joint-stock banks were in value £4,665,110. This, divided by the number of banks (108), gives an average circulation of only £43,200 for each; or, if we include the branches the average for each office or establishment is only £7000. Supposing the money to be employed in discounting at five per cent., the annual profit on £4,665,000 would be only £230,000, or no more than £350 to each establishment. It is evident that their profits must be chiefly derived from deposits, which they can employ at five per cent., while, we believe, they give only two.

The issues of the *private* banks, by the same return, were £7,610,700, which gives an average of about £14,000 for each establishment. It appears that the joint-stock banks, so far from superseding the private banks, have had but a very slight effect in narrowing their issues.

The chief advantage conferred on the Bank of England, and constituting its charter of monopoly, is the privilege of being the only bank in London, or within sixty-five miles of it, having more than six partners, which can issue notes payable to the bearer on demand. The bank has also the privilege of its notes being a legal tender by other banks for any sum above £5, so long as it pays its notes in cash on demand. This provision is a security to all other banks against the effects of sudden runs upon them for gold. It is ordained by act of parliament, that "upon one year's notice, given six months after the expiry of ten years from the 1st of August, 1834, and upon repayment by parliament of all sums that may be due from the public to the bank at the time of the expiration of such notice, the exclusive privilege of banking granted by this act shall cease and deter

mine at the expiration of such year's notice." Hence, in 1844–5, there will necessarily be a renewal or modification of the peculiar privileges of the Bank of England.

Stocks—Stock Exchange.—There are various kinds of stocks. Shares in a joint-stock company are called stock, and so are shares of debts due by government. It is the last-mentioned stock, which is variously termed *public securities*, or the *funds*, that requires to be explained, and in doing so we take the liberty of using the definition of a popular writer.*

"In every war in which this country has been engaged since the Revolution, the amount of the annual taxes has been found inadequate to defray the expenses of government. To supply the deficiency, our rulers have generally had recourse to loans—that is to say, they have borrowed money from such individuals as were able and willing to lend it, giving these individuals a security for the payment of a certain annual interest. To explain the nature of this transaction, I shall take a very simple case. Suppose, then, that £100 is the sum which government wishes to borrow, and that an individual offers to lend that sum at an interest of 5 per cent. On paying down the money, the lender receives a bill, bond, or acknowledgment, for the amount; by which acknowledgment he is entitled to draw yearly from the public revenue £5 of interest, but on the express condition that he is not to demand repayment of the principal, or sum lent, unless government is willing to repay it. The person who thus possesses the bill or acknowledgment is said to be a *holder of* £100 *of* 5 *per cent. stock*, and the money lent upon that bill constitutes a part of what is called the *national debt*, because it is in fact borrowed by the nation, and the interest is paid out of the taxes. It is obvious, however, that few persons would be disposed to lend money on the condition of never being allowed to demand repayment, even though they were quite certain of receiving annual interest, and of transmitting the right to that interest to their posterity. To remedy this inconvenience, therefore, the lender who wishes to employ the sum which he lent to government in any other way, though he cannot directly demand repayment, is at liberty to sell his bill to anybody who will purchase it, and for any sum that another may be willing to pay for it. In doing so, he merely sells to a second person the right which he himself possessed to the annual interest of £5, and that second person is of course at liberty to dispose of his right to another in the same way. This transaction, in general, is called a *transfer of stock*; and in the particular case which I have supposed, the one is said to sell, and the other to buy, £100 of 5 per cent. stock. If 5 per cent. be considered as a fair and equitable interest for money lent, it is obvious that such a bill as I have now been speaking of, or, in other words, that £100 of 5 per cent. stock, is just worth £100 sterling. It is possible, however, that in certain circumstances the holder of that bill may receive more, or be obliged to take less for it than £100. If two or three individuals, for example, have each a sum of money, which they are anxious to lay out at interest, but find it difficult to do so, a competition will naturally take place among them to become the purchaser of the bill in question, which will always secure to the holder £5 of yearly interest. The possessor of the bill will of course take advantage of this competition, and raise his price, say to £105. The purchaser, therefore, pays £105 for £100 of 5 per cent. stock, or he lays out his money at an interest of £5 for every £105, which is at the rate of something more than 4¾ per cent. If, on the other hand, however, the possessor of the bill or stock is anxious to dispose of it, while few are willing to buy it, he will be forced to offer it for less than £100, say £95. The purchaser, in this case, pays £95 for £100 of 5 per cent stock, or he lays out his money at an interest of £5 for every £95, which is at the rate of something more than 5¼ per cent. For simplicity of illustration, I have supposed that £100 is the sum borrowed by government, and that of course there is just one bill to be disposed of, or transferred by the lender. If it be supposed, however, as is really the fact, that the loans generally amount to several millions, the necessity which the lenders are under of selling their bills, or, in other words, transferring their stock, will be more apparent. The transaction between government and the lenders is precisely the same in the case of millions as in that of a hundred; and it is unnecessary, therefore, again to illustrate the general principle of that transaction. It is evident, however, that even the most opulent merchants, who are generally the lenders, cannot be supposed to have such a command of money as to be able to advance ten or twelve millions to government at once. When they contract for a loan, therefore—that is, when they agree to lend to government the sum required—they generally pay the money by instalments, or partial payments at certain intervals, say one million a month, till the whole is advanced. In the mean time, they sell or transfer the bills or securities which they receive from government to those who may have money to lay out at interest, and who of course will be disposed to purchase such bills, so that the sale of the bills of the first instalment may enable them to pay the second. In this way, government securities or bills become articles of commerce, and their price is regulated, like that of any other article, according to the supply and demand.

"It is easy to see how the price of stock is liable to fluctuation from accidental circumstances. I shall not attempt to enumerate these: but it may be worth while to point out how it is affected by peace and war, as these two conditions of the country are generally found to have the greatest influence in raising or depressing the value of stock. In the time of war, then, the price of stock is comparatively *low*, because, in such a state of things, it is likely that government will be under the necessity of borrowing; and as every loan produces new bills, the quantity of those to be disposed of, or, in other words, the supply of the market, will be increased. The price, therefore, will fall, for the same reason that the price of corn falls after a plentiful harvest. In time of peace, again, the price of stock is comparatively *high*, because, in such a state of things, the taxes are likely to be sufficient to defray the expenses of government without any loans, and consequently no new bills are to be disposed of, or the supply, though not positively diminished, ceases to be augmented. For the same reason, the price of stock in the time of war is materially affected by the nature of the intelligence that comes from the scene of action. If that intelligence be unfavourable, stock will fall, because there is a prospect either of protracted warfare, or of the necessity of more vigorous exertions on the part of government; in both which cases new loans may be necessary, and consequently a new supply of bills will be thrown into the money market. On the other hand, should the intelligence be favourable, the price of stock will rise, because the prospect of a successful termination of the war renders it probable that there will be no new loan, and consequently no new supply of stock.

"It is this variation in the price of stock that gives room for the nefarious practice of *stock-jobbing*. That practice consists in raising and circulating reports calculated to raise or depress the price of stock, according to the particular views of the individual. If he wishes, for example, to sell his stock or bills, he endeavours to propagate some report or other favourable to the issue of the war, and the establishment of peace, in order, if possible, to raise the price of stock; and, if he wishes to buy, he

* Blackwood's Magazine: 1816.

propagates reports of a contrary tendency. It is painful to think that this abominable system is sometimes carried on by men whose rank and station in society, to say nothing of the obligation of morality and religion, might be expected to place them far above any such disgraceful acts, but, in general, I believe it is confined to men of desperate fortune and little character, who subsist by a specie of gambling, to which the finance system of this country has opened a wide and extensive field. I allude to those men who make a practice of buying and selling stock, without actually possessing any, and whose transactions, therefore, are nothing more than wagers about the price of stock on a certain day. To explain the nature of the transaction by an example: I shall suppose that A. sells to B. a government bill of £100, or £100 of 5 per cent. stock, to be delivered on a certain future day, and that the price is fixed at £102. If, when the day arrives, the price of stock shall have fallen to £100, A. would be able to purchase the bill in question for £100, while, in consequence of his bargain, B. would be obliged to pay him £102 for it, so that A. would gain £2. If, however, stock had risen to £104, B. would still be obliged to give only £102, so that A. would lose £2; but instead of actually buying and selling the stock, the bargain is generally implemented by A. paying to B., or receiving from him, the £2, or whatever may be the sum of loss or gain. In such a case as this, it is obviously A.'s interest that the price of stock should fall, and as obviously B.'s interest that it should rise, between the day of the bargain and that of settling; and hence the temptation held out to both to circulate reports favourable to their own particular views. B., or the buyer, is usually denominated a Bull, as expressive of his desire to *toss up*; and A., or seller, a Bear, from his wish to trample upon or *tread down*. The law, of course, does not recognise a transaction which proceeds on a principle of gambling; but a sense of honour, or, what is perhaps nearer the truth, *self-interest*, generally secures the payment of the difference, as the person who refuses to pay his loss is exhibited in the Stock Exchange under the designation of a *lame duck*, a disgrace which is considered as the sentence of banishment from that scene of bustle and business."

In the preceding remarks, the loans to government have been supposed to be negotiated in bills bearing five per cent. interest; practically such is not the case. The stocks, from a variety of circumstances, are of different denominations, some having been created at one rate of interest or profit, and some at another. The principal stock is called the three per cent. consolidated fund—that is, several borrowings consolidated into one debt at three per cent. This stock is usually called, for shortness, three per cent. consols. Another stock is called three per cent. reduced annuities, or briefly, three per cent. red. an. The three per cent. consols embrace a debt of upwards of £300,000,000, or nearly one-half of all the money due by the nation; and in most instances it is a share of this debt which people purchase when they buy into the funds. In 1839, the debt, funded and unfunded, amounted to £763,803,563, the annual charge or interest upon which, to be raised by taxation, was £28,669,333. It was ascertained that this interest was payable to 279,751 persons, fully two-thirds of whom received under £50 each.

Banks in Scotland.—The earliest banking institution in North Britain was the Bank of Scotland, instituted by a charter of incorporation from the Scots parliament in 1695. The original capital was £1,200,000 Scots, or £100,000 sterling. The amount was raised by shares differing in extent, from £1000 Scots, or £83, 6s. 8d. sterling, to £20,000 Scots. In 1774, the amount of stock was extended to £200,000 sterling; and now it is a million and a half sterling. The shares are now £100 sterling each.

The establishment of the Bank of Scotland was of great service to the nation; the landholders borrowing notes and bringing the country into cultivation, and a spur being by that means given to various branches of manufactures. The Bank of Scotland continued to be the only bank in the country till the year 1727, when a new and similar establishment was constituted under the title of the Royal Bank of Scotland. These two establishments engrossed all the respectable banking business in the country till the year 1746, when a new association was formed, and incorporated by royal charter, with the title of the British Linen Company. The object of this association was at first to encourage the linen manufacture of Scotland, but gradually it fell into the course of common banking business, and now occupies a high station among these institutions. From £100,000, the capital of this bank has been raised to £500,000, where it has long remained stationary. By adroit management it carries on an immense deal of business and possesses as high credit as any bank in Scotland.

These are allowed to take precedence of others erected in the subsequent part of last, and in the present century, either in Edinburgh or in the provinces; and their shareholders enjoy the privilege of being responsible only for their individual stock.

All the banks, with few exceptions, are joint-stock associations, and are banks both of deposit and issue. Except the few private houses, all issue notes of one pound and upwards, which are payable on demand at the office whence they are issued. It was at one time ordained that Scottish bank notes should not be re-issued after they were three years old; but such a regulation is abrogated, and they are now sent out as long as they are in good condition. Almost all the modern notes are produced from plates of hardened steel, and of such peculiar and intricate devices, that forgery cannot be attempted with success, or remain long undetected.

No periodical returns of their issues are made by the Scottish banks. But on turning to the evidence given before the parliamentary committees of 1826, we find the usual value of the small notes in circulation estimated by Mr. Paul of the Commercial Bank, and Mr. Blair of the British Linen Company, at £1,800,000, which is increased by a third at particular seasons, and when trade is brisk. The committee estimate the paper money of all kinds in circulation in 1826 at £3,309,082. But in the year of great speculation, 1825, they estimate the highest amount of notes in circulation at £4,683,000, the lowest at £3,434,000.

The following is a return of the joint-stock banks existing in Scotland at 5th January, 1839, with the dates of their establishment:—

The Bank of Scotland, Edinburgh, 1695; the Royal Bank of Scotland, Edinburgh, 1727; the British Linen Company, Edinburgh, 1746; the Commercial Bank of Scotland, Edinburgh, 1810; the National Bank of Scotland, Edinburgh, 1825; the Aberdeen Bank, Aberdeen, 1825; the Ayr Bank, Ayr, 1825; the Dundee Banking Company, Dundee, 1825; the Dundee Union Bank, Dundee, 1825; the Dundee New Bank, Dundee, 1825; the Glasgow Bank Company, Glasgow, 1825; the Greenock Bank, Greenock, 1825; the Leith Bank, Leith, 1825; the Paisley Bank, Paisley, 1825; the Perth Banking Company, Perth, 1825; the Renfrewshire Banking Company, Greenock, 1825; the Paisley Union Bank, Paisley, 1809; the Aberdeen Town and County Bank, Aberdeen, 1825; the Arbroath Bank, Arbroath, 1825; the Dundee Commercial Bank, Dundee, 1825; the Glasgow Union Banking Company, Glasgow, 1830; the Ayrshire Banking Company, Ayr, 1831; the Western Bank of Scotland, Glasgow, 1832; the Central Bank of Scotland, Perth, 1834; the North of Scotland Banking Company, Aberdeen, 1836; the Clydesdale Banking Company, Glasgow, 1837; the Southern Bank of Scotland, Dum-

ries, 1837; the Eastern Bank of Scotland, Dundee, 1838; Edinburgh and Leith Bank, Edinburgh, 1838; being 29 in all.

The business done by the Scottish banking-houses is prodigiously increased by the institution of their branches in the provincial and country towns. From those banks already noticed, which are situated in Edinburgh, and from two or three of the chief provincial banks, there were altogether deputed, not long since, about one hundred and forty branches, and this number is undergoing a regular increase. The subsidiary establishments are to be found in every town of any note, from the borders to the most northern point of Scotland. They are conducted by resident wealthy or responsible merchants and others, who give securities for intermissions, and are subjected to a very rigorous supervision by inspectors, who are continually travelling about for this purpose.

The prudent and enterprising manner in which the business of banking is conducted in Scotland, has often been the subject of remark and commendation. Several reasons may be assigned for the remarkable stability of the Scotch banks. Each bank, before gaining credit with its neighbours, must show that it possesses a sufficient paid-up capital, with a reserve fund in London, on which orders for balances may be given. It is also the custom of the banks to exchange the notes of each other once or twice a week, by which means the notes are sent very speedily back to the issuers, and thus an over-issue on the part of any single establishment is prevented. There can only be an over-issue by all the banks in the country becoming equally reckless, a thing not likely to occur to any serious extent. A third cause of the stability of the institutions, is the liability of shareholders for the debts of the establishment. Excepting in the case of the three old-established banks above specified, all the shareholders in the various banks are liable not only for the amount of their own shares, but for the shares of all the others; and the whole of their property may be seized to make up deficiencies. Although many of the shareholders are certainly not men of opulence, a number are so; and as their fortunes are good for the paper issued, the public runs no risk of injury. To strengthen this liability of shareholders, by the law of Scotland all heritable property, lands and houses, may be seized in satisfaction for their debts. As this is not the case in England, where personal or movable property can alone be taken by creditors, it would not be possible to establish banks in the south part of the island on the principle of the Scottish banks, till the law touching heritable property be altered.

Other causes, not of a legal nature, conspire to render the system of Scottish banking perfect. By reason of the circumscribed limits of Scotland, and the character of the people, a ramification of intelligence is created and preserved throughout the whole of society, altogether unknown in England, whereby the character, the wealthiness, and the conduct of the partners or directors of each bank, are made fully known to the rest. All seek, and all find, a knowledge of the management of each other. All are mutually on the watch; and symptoms of over-issues or other improprieties are spread with an amazing celerity, and have their immediate effect.

In comparing Scottish banking institutions with those in England, and considering the different manner in which paper money has been guided by the two nations, the uniform security of the former appears almost miraculous. From the first issue of the bank-notes in 1704, till the year 1830, a single panic or general run did not occur in Scotland, although, during at least two-thirds of the intervening period, paper money had been used to the almost total exclusion of a gold currency. Partial and very temporary runs have assuredly been felt, from the effects of short-lived slander or mistaken notions, which have invariably been readily quashed; but in the course of a hundred and twenty-six years, there have only been two or three cases of banks failing to pay twenty shillings a pound (they paid 10*s.*), and four, in which, after a short suspension of payments, all demands were liquidated. Their failure or stoppage, with the exceptions we mention, did not put the public to any loss; but this was to the injury of the shareholders, many of whom were reduced from affluence to poverty.

The very common practice of making deposits of small sums in the banks, has further assisted in giving strength to the institutions. Each bank receives deposits of any sum above £10, for which a regular interest is given; and on this account the banks may be said to be the custodiers and traders upon all the spare capital of the country. Besides employing capital in discounting bills, lending money on heritable security, &c., the Scottish banks grant loans of fluctuating amount, called *cash accounts*. By a cash account is signified a process, whereby an individual, on entering into an arrangement with a bank, is entitled to draw out sums as required, to a stipulated amount, and by an implied condition to make deposits at his convenience towards the liquidation of the same.

Cash accounts are said to have originated from the following circumstance:—A shopkeeper in Edinburgh, in the year 1729, found himself at times in the possession of more than a sufficient supply of ready money to carry on his trade, the overplus of which he consigned to the care of the neighbouring bank. But on other occasions, by reason of the length of the credits given to his customers, his money became so scarce, that, after exhausting his bank deposits, he still felt himself in difficulties. Several dilemmas of this kind having occurred, he was prompted to make a proposal of a novel nature to the bank, to the effect that, if it would accommodate him in straits with small loans, he would always shortly afterwards make up such debits, and that the parties should come to a balancing of accounts at periodical intervals. It seems this proposal was acceded to. A cash credit, or liberty to draw to a certain extent, was instituted under securities; and thus originated a system which has been of immense benefit to bankers and traders, and is now followed over the whole of Scotland.

Cash credits are guaranteed by two sufficient securities, or the applicants give infeftment to heritable property in caution of the contingent debt, and when any such debt is liquidated, the deed is cancelled. The expense of expeding a cash credit varies according to the amount of the desired loan. One for £500 may be stated at about £15. The deed requires no renewal. At the end of every six, and in some cases twelve months, calculations are made of entries and debits; the interest for and against the bank—the one being a per cent. higher than the other—is added and balanced, and an account being then rendered, the balance, if in favour of the bank, is either paid up, or remains against the debtor at interest to his new account. In these cash credits the borrower is always at the mercy of the bank, which can call upon him at any time to balance his account, or, by his failing to do so, have recourse upon his securities.

Since 1729, cash credits have increased to an amazing extent. In 1826, it was computed that there were TEN THOUSAND in Scotland, varying in amount from £100 to £5000 each, but averaging from £200 to £500. Though originally designed for mercantile persons, they are now operated upon by farmers, manufacturers, house-builders, miners, lawyers, and all classes of traders and shopkeepers. From 1826, it is extremely probable that, instead of decreasing, they have increased a thousand or two more.

Banks are in the present day established in every civilized country. In the United States of North America they have been instituted to a great extent, and frequently on most unsound principles, their notes being

for very small sums, and these in few instances negotiable without a loss at a comparatively short distance from the place of issue; often, also, there has been an universal stoppage of cash payments, in consequence of over issues of paper money, a sure testimony that the country was trading beyond what its actual capital warranted.

Savings' Banks.— These are banks for receiving and taking charge of small sums, the savings of industry, and have been instituted for the benefit of workmen and others, who may be able to spare a shilling and upwards from their weekly earnings. The first savings' bank is understood to have been begun in Philadelphia in 1816, since which time they have been established in all parts of the United Kingdom, France, and other countries. Several acts of parliament were successively passed between 1817 and 1828, for the regulation of savings' banks in England; and in the year last mentioned, the whole of these were consolidated in one statute (9 Geo. IV. chap. 92). This act, together with another passed in 1833, conferring additional and important privileges on savings' banks (3 Will. IV. chap. 14), constitutes the existing law relative to these useful establishments: in 1835, the act was extended to Scotland. Savings' banks established according to the provisions of these acts are entitled National Security Savings' Banks, because the money deposited in them is paid into the Bank of England on account of government, whereby the nation becomes security for the amount of deposits—a security reckoned the best of all that could be given to the depositors. The interest given by government on the sums so deposited is £3, 16s. 0½d. per cent. per annum, whatever may be the fluctuations in the value of the public funds during the term of investment. This rate of interest being higher than what government could otherwise borrow money for, it happens that the public are really losing money annually by their generosity. The rate of interest payable to the depositors is £3, 8s. 5½d. per cent. per annum.

Deposits of from *one shilling* to *thirty pounds* may be received by these banks; but no individual depositor is allowed to lodge more than thirty pounds in one year, or than £150 in whole. Charitable and provident institutions may lodge funds to the amount of £100 in a single year, or £300 in all; and friendly societies are permitted to deposit the whole of their funds, whatever may be their amount. Compound interest is given on the sums lodged, the interest being added to the principal at the end of each year in some banks, and at the end of each half-year in others, and interest afterwards allowed on the whole. Any depositor may receive, on demand, the money lodged by him, if it do not amount to a considerable sum; and even in that case it will be returned on a few days', or at most two or three weeks' notice. Practically, payment is always made on demand. The wisest and most effectual provisions are made for ensuring the proper management of the affairs of the banks, so that those who intrust them with their money may place implicit reliance on its safety.

Each depositor is provided with a small book, in which his deposits are entered, and the amount of his interest marked. On the 20th of November, the interest is added in the bank books whether the depositor call or not. It is computed for the full term, and upon every fifth fraction of a pound. Depositors have thus the advantage of having their principal sum gradually increasing at 3½ per cent. compound interest. So successful has been the establishment of the savings' banks in England, that in November, 1835, there had been deposited in them, up till that period, the sum of sixteen millions and a half of pounds. The deposits now amount to about twenty two millions.

HISTORY AND NATURE OF LAWS.

THE ROMAN LAW, AND THE SYSTEMS DERIVED FROM IT.

Law may be defined as a system of regulations adopted in social communities for the general advantage, and on that account binding upon all the individuals constituting that community. Such regulations being absolutely essential to the existence of a social state, we may safely infer, that no sooner were any portion of mankind advanced into that state, than law began to exist. Its origin, being thus early, is necessarily obscure: we know extremely little of its history in any of the nations of antiquity besides Greece and Rome.

In Grecian history we find more than one well-known code of laws; but so limited and simple was their operation, and so little are they adapted to the wants of a complicated state of society, that they are to be looked upon rather as the municipal regulations for the temporary government of a small knot of men, than as systems from which any additional hints are to be obtained to aid modern jurisprudence. It does not appear to have been in Greece—the source, as it was, of philosophy, literature, and art—that useful laws, applicable to the business of life, had their origin. The Phœnicians, of whose history and institutions we unfortunately know so little, seem to have been among the first to establish a general system of mercantile law, which their extensive commerce distributed abroad. To Rhodes, which can scarcely be considered a province of Greece, we owe the earliest regulations applicable to shipping. The law of average, or that by which the loss occasioned by throwing goods overboard to relieve a ship in distress is laid proportionally on the whole property saved (a most important branch of the commercial code of modern nations), had its origin in that state, and is still called the Rhodian law.

There is the less importance in the inquiry into the laws of early nations, since all of ancient law which continues to have any force in civilized Europe, has come to us through one channel—namely, the Roman law. Most European nations, being, as it were, the remoulded wrecks of the Roman empire, have obtained the basis of their laws from that source. The Roman law is, therefore, by the common consent of Europe, denominated *The Civil Law*. In Europe, there was but one other system, at an early period, to combine with it. This was *The Feudal Law*, or that code of usage which had sprung up in European nations before they received the civil law. It is, after all, only in some countries that the feudal law exists: in other cases, the civil law has established a proportionate, and in some a preponderating influence

In Holland, and Germany, the original purity of the principles of the civil law have been preserved with such zealous care, that the writings of the lawyers of those countries are quoted as authorities on the law of Rome. In Spain, the system has been grafted on the feudal law, and on some peculiar customs derived from the Moors. In France, previously to the Revolution, the civil and the feudal law were united, as in most other nations of Europe: and in the Code Napoleon, which we shall hereafter have more particularly to notice, there are many regulations from the jurisprudence of Rome allowed to exist, or revived, while many of the feudal customs which were formerly so prominent are abolished. England distinguished herself from the other nations of Europe by rejecting the civil law as authority, but many of her institutions were derived from its spirit and practice. "With all its imperfections," says Sir William Jones, "it is a most valuable mine of judicial knowledge; it gives law at this hour to the greatest part of Europe, and, though few English lawyers will make such an acknowledgment, it is the true source of nearly all our English laws that are not of a feudal origin." In Scotland, the Roman law has always been a special subject of study; and though the number of native decisions, the extent of statute-law, and the necessary adaptation of the system to a state of society very different from that in which Justinian promulgated his laws, have rendered references to this source comparatively unfrequent, the civil law is still authority where the particular law of Scotland does not contradict it. It is a special object of study by the legal profession, and is the subject on which the members of the bar are first examined before they are admitted to practice. To complete the general outline of the influence of this system in modern Europe, it must be mentioned as the source of the canon law, which was created into a system by the Church of Rome, and still exists, more or less, either separately or incorporated with other systems, in all countries where the papal authority was acknowledged. The law of nations, or international code, has been, by the common assent of civilized nations, derived from the law of Rome.

Writers have divided the legislative sources from which the laws of Rome spring into five. Among the first of these is generally classed the people, and the laws sanctioned by them are technically divided into the *Lex* or *Populiscitum*, and the *Plebiscitum*, the former including the acts of the whole people, the latter those of the plebeians convened by their tribunes. It would appear that, in the earlier periods of the monarchy, the authority of all classes was in this description of legislation tolerably equal. Servius Tullius, however, the sixth king, introduced the well-known divisions into centuries and classes, by which ninety-eight votes were secured to the first class, while ninety-five only were allotted to the remaining five, of which the lowest and most numerous possessed only one. The tribunes, who were officers chosen for the ostensible purpose of protecting the people from the tyranny of the aristocracy, were, by the exclusive and important power they possessed, again the means of restoring popular election. They procured the assembling of the people by tribes, in which their votes were given individually, and without the necessity of a property qualification. All popular legislation, however, soon disappeared with the authority of the emperors. Augustus, except in one instance, found the popular assemblies profoundly obedient, and under his successor they ceased to exist; so that long before the Roman laws had become the grand system of jurisprudence which they constituted under the auspices of Justinian, the popular source of legislation had been dried up.

The decrees of the senate (*Senatus consulta*) are another source of the Roman law. The legislative power of this body seems to have grown out of its judicial, which was at first its proper province. By the original constitution, the people alone were understood to be the makers of the laws, and their authority seems to have been gradually engrossed by the senate, the interference of which, from having been confined to mere advice and paternal assistance in legislation, gradually extended itself to that of making laws. It was not till the days of Tiberius that these decrees were publicly promulgated as laws; but the senate had by that time lost its independent authority, and become merely an instrument in the hands of the emperor. The proceedings of the senate were generally suggested by some public officer, as a minister of the crown now introduces a bill into parliament, and a majority decided for passing or rejecting. In later times it became the practice for the emperor to propose a new law either by a message or letter laid before the senate, or by an oration delivered; and as there was no opposition intended or permitted, the legislative body became the mere registrars of the monarch's will.

Another source of the civil law is the constitutions and rescripts of the emperors. At what time they commenced the practice of making laws without the nominal concurrence either of the senate or the people, is not very distinctly known. A passage in the Pandects, the authenticity of which, long doubted, has been confirmed by late discoveries, states that the will of the emperor is law, and that by a particular act, the people had conferred upon him all their own power, which was thenceforth absolutely to remain in his hands—one of those transactions under the guise of which rulers are so fond of concealing their lust of power, by representing as a free gift that which no one can venture to refuse. Hadrian is believed to be the first emperor who exercised the authority of a supreme legislator. The imperial laws were issued in a variety of forms. Sometimes there was a new constitution springing from the monarch's own creative mind—on another occasion he would give his imperial judgment on some nice speculative question of law dutifully submitted to his wisdom. Many of the imperial laws, however, were the decisions of the monarch in particular cases, the spirit of which was piously preserved by the lawyers of the age, as the best criterion for a general rule of action. In modern times we associate with despotism a horror of innovation, and a desire to leave all institutions, whether expedient or hurtful, untouched. It was different in imperial Rome. The emperors were never tired of displaying the legislative produce of their own genius, or those which the prudent and courteous discoverers did not compete with them for the merit of suggesting. During four centuries from Hadrian to Justinian, the manufacturing of legislation was in almost constant operation. Diocletian alone enacted 1200 new laws—a number that would do no discredit to a moderately long reign of a British monarch.

Edicts of the prætors are another, and not the least important, source of Roman jurisprudence. Of these high magistrates there were different numbers at different times; but the supreme authority vested in two, one having jurisdiction over the city, the other over the provinces. The prætor held his office for a year; and, as a provision against his adapting his judgments to his own personal views, the Cornelian Law obliged him to issue a sort of proclamation at the commencement of his magistracy, imbodying the general principles to which he should adhere in his judgments; and thus, at the moment when he was least acquainted with the duties of his office, he had to fix the plan on which he was to execute them. The prætor was not originally vested with legislative power—it arose in the exercise of his judicial authority. He was merely the interpreter of the laws; but when they seemed to him to be hard or otherwise erroneous, he did not scruple to suspend or alter their execution. The prætorian law has been compared to the equity system in England—a distinct system of law, arising out of these

instances in which it was necessary to give relief from the strict interpretation of the common law. The common law had fixed a particular rule; a case would arise in which its application would be very oppressive; the common law judges, bound by their system, could give no relief; but the chancellor took upon him to modify the evil, and his decision was followed in like cases. The system of the prætors was somewhat similar, with this difference, that as they had no judges to compete with who pursued a system of strict interpretation, their equity had rather a tendency to modify the common law than to raise a rival structure. "The secret or probable wish of the dead," says Gibbon, when illustrating the prætorian system, "was suffered to prevail over the order of succession and the forms of testaments; and the claimant who was excluded in the character of heir, accepted with equal pleasure from an indulgent prætor the possession of the goods of his late kinsman or benefactor. In the redress of private wrongs, compensations and fines were substituted to the obsolete rigour of the Twelve Tables; time and space were annihilated by fanciful suppositions; and the plea of youth, or fraud, or violence, annulled the obligation or excused the performance of an inconvenient contract." With the expiry of his year of office, the edicts of the prætor cease to be imperative; but they were still looked up to as precedents; and when they became venerable by long use, they were considered as part of the fixed law of the land. By an enactment of the Emperor Hadrian, called the "Perpetual Edict," this doubtful and fluctuating branch of the law—at least as much of it as the emperor chose to sanction—received what might be called the royal assent, and was incorporated with the other portions of the civil law, as a distinct branch of the system.

In almost every nation which has passed gradually from barbarism to civilization, many laws will be found to have come into existence without the direct interference of any legislature, and from no better defined origin than a habit on the part of the people of submitting to certain rules, or obeying the commands of certain individuals; it is, indeed, generally in this manner that legislatures have originated. A considerable portion of the Roman law was of this kind; it arose in custom, was handed down by tradition and practice, and called consuetudinary law. It is a disputed question, how far it was necessary that some competent authority should certify that the principle actually was an established portion of the ancient customs of the nation, before it could be safely acted upon as law. It is a peculiarity of the civil, as distinguished from the English jurisprudence, that, according to the former, a law may be tacitly abrogated by long disuse. In England, no law, however long forgotten, ceases to exist till it be repealed by the legislature.

The last fountain of Roman jurisprudence which we shall notice, is the *Responia Prudentum*—literally, the answers of the wise men—the opinions of the sages of the law. It is difficult to conceive a state of society in which the opinions of legal writers, as to the interpretation of the law, will not have an influence. If a case occur in which the judge is uncertain as to the proper application of some enactment, where can he find a more suitable or safer guide than in the opinion of some far-seeing lawyer, who has anticipated the case without knowing the parties, and who, consequently, cannot have proceeded on a bias to one or the other—a defect of which the judge, if he be the first to interpret the law, will be at least suspected? Even in England, where interference with the doctrines of the common law is so jealously opposed, the early commentators are the only authority for its provisions: and there is no doubt that they gave the hue of their own opinions to the doctrines they laid down. In Rome, however, where the profession of the law, instead of being a trade, conferred a high rank in society the opinions of leading counsel had a much more extensive range. They not only interpreted, but they could create law, by suggesting how the decision should proceed in imaginary cases. At an early period, the relation of lawyer and client was that of patron and dependant. Patricians alone could act as lawyers, and the science was involved in riddles to which they only possessed the key. The poor client was dependent on the good will of his lordly patron for such protection from oppression, whether through the law or otherwise, as the influence of the latter might enable him to afford. When population and transactions increased, and the laws, instead of a mystery, became a serious study, which depended more on laborious application, than simple initiation, the profession was opened to plebeians. It became not an unusual case, at a still more advanced period, for the patron and lawyer to be separated; the former being chosen for his influence, the latter for his skill. The forms which regulated the intercourse between patron and client, however, still retained some relics of their origin; and it is a striking illustration of the influence which Roman jurisprudence has exercised over the human race, to find these still existing. To this day, it is against all etiquette to bargain with a barrister for his work. The law gives him no claim for remuneration, which it kindly views as unworthy of the dignity of his profession; and it is usual to pay him beforehand for his legal assistance. On the other hand, though he has been paid beforehand, he cannot be compelled to perform any duty in return, for he is presumed to assist the client from his own free good will. In most other professions, it is the custom for the person employed to feel under a sort of obligation to the employer who has preferred him to others. This principle is reversed at the bar; for the person employed is the patron, and the employer the client.

But to return to the legislation of the sages of the law During the commonwealth, whoever, by his superior sagacity or knowledge, could obtain deference for his opinions, might be said to be a manufacturer of laws. Under the earlier emperors, the privilege of promulgating authoritative opinions was confined to a limited number of lawyers, of equestrian rank, licensed by the government; but the profession was again thrown open to the public by Hadrian. The most brilliant era of legal wisdom commences within a short period of the decline of the republic, and terminates with the reign of Alexander Severus. Mucius Scævola, the tutor of Cicero, was one of its earliest ornaments; and it included the celebrated jurisconsults Paul, Ulpian, Papinian, Capito, and Labeo. The two last of these, who lived in the age of Augustus, were the founders of the two sects—the Proculians and Sabinians—into which the Roman lawyers were divided. The former advocated the doctrine that the laws should be amended at discretion, to meet circumstances as they occurred; the latter maintained the theory of their strict interpretation, be its inexpediency in the particular instance what it may. Capito, applying his doctrines to the inroads which the emperors were gradually making in the freedom of the republic, was a supporter of this species of innovation, and his followers were enrolled among the ready tools of despotism. Labeo sought to support the ancient freedom of the republic by an adherence to the letter of the old laws, and his sect became the champions of what may be termed constitutional freedom. The conflict is not unlike that which lately existed in Britain between Lord Mansfield and Lord Camden; the former supporting, to a certain degree, an equitable, the latter in all cases, a strict interpretation of the law.

Having now enumerated the principal sources of the Roman law, we may notice its remarkable epochs. The laws enacted during the reigns of the kings, although a curious subject of inquiry among antiquaries, exercised too little influence on the civil law, as handed down to

modern Europe, to be of much practical importance. During the administration of the decemvirs, the celebrated laws of the Twelve Tables were adopted. The traditionary history connected with this code is, that the Roman government, conscious of the want of a proper legal system, sent commissioners to Greece, who, after studying the laws of that comparatively civilized nation, produced the Twelve Tables for the acceptance of the Romans. The tradition, like many others connected with the Roman history of the period, has not sufficient historical evidence to support it against its natural improbability. These laws, of which specimens are professed to be preserved, are written in a language so different from that of the classical writers of Rome, that they were to Cicero an object of much the same curiosity as the old Scottish acts were to Bacon. Like the first laws of other rude states, they are simple and brief in their enactments. The bankruptcy system, which has so sadly shocked several benevolent scholars, that they have endeavoured to explain it as a merely symbolical provision, is peculiarly sharp and effective. It enacts that the insolvent debtor shall be cut in pieces, and that his body shall be distributed among his creditors. When law became a science openly studied, the Twelve Tables became the subject of many commentaries. It was not, however, till the Romans had been for some time degenerating, that those great collections of legislative wisdom which have come down to modern times were commenced. The first attempt to construct a code seems to have been the Perpetual Edict of Hadrian, already alluded to. Two private individuals, Gregorius and Hermogenes, appear to have collected the imperial constitutions into a system, or code, of which some fragments are still preserved. Nothing whatever is known of the biography of these compilers; it has not even been discovered in what reigns they respectively lived, though their labours received high commendation at the hands of Theodosius the Younger. Under this emperor, the celebrated Theodosian Code was promulgated, in the year 438. The compilation of this body of laws was committed to eight individuals, who were allowed considerable latitude in explaining and abridging, and even in supplying deficiencies. It contains the legislative acts of sixteen emperors, from the year 312 to 438. Fragments of this code have been rescued from oblivion inch by inch, by modern scholars, whose labours, it may safely be calculated, have amounted to some twenty or thirty times more than those of the original compilers. The celebrated Godfroy, of Geneva, spent thirty years in the task; and within the last twenty years, the discovery of some further fragments induced the celebrated Angelo Mai to study the Roman law for the purpose of editing them.

It is now our turn to notice those great collections of the legal wisdom of the Romans, to which the above may be considered only preparatory. In 529, ten commissioners, appointed by Justinian, prepared *The Code*, or *Codex*, as it is termed, from the collections previously made, and the intermediate enactments. Soon after its promulgation, the emperor issued several new constitutions, and the whole were consolidated and re-issued in 534. The great task was superintended by the celebrated Tribonian, whose eminent learning and discrimination, allied with untiring industry, but stained by the vices of corruption and partiality, have afforded a fruitful theme of praise and obloquy. This was by no means Tribonian's only labour. In the year 530, he was appointed the chief of a commission of sixteen, whose duty it was to cull the choice and useful passages from the authors of comments and opinions. The various authorities, which, we are told, would have made several camels' loads, were thus reduced within a compass which, if it do look somewhat formidable to the consulter, is still manageable. Such are the fifty books which constitute the celebrated "Pandects," or "Digest" of the Roman law; a work without which modern Europe would have known but little of the subject. Along with Theophilus and Dorotheus, the indefatigable commissioner was able to prepare, in conjunction with this great digest of the law, an abridgment or manual of its leading principles, which bears the well-known name of "The Institute." This condensed and elegant little work was sanctioned by the emperor in 533. It has become the subject of innumerable comments, and has afforded the model on which the legal writers of most modern nations have desired to prepare their treatises. Justinian continued, during the remainder of his life, to promulgate new laws; and these, collected together under the title of "*Novellæ*," or "Novels," form the remaining department of the "*corpus juris*," or body of the civil law.

With Justinian we reach the climax of the Roman law; and to trace its farther progress in the empire has been more a subject of curiosity to the antiquary than of importance to the lawyer. Some fragments by later commentators, chiefly in the Greek language, have been disentombed by zealous searchers. The Roman law was nominally respected by the northern conquerors of Rome. Alaric, King of the Visigoths, indeed, caused a compendium to be prepared for the use of his dominions, consisting chiefly of an abridgment of the codes of Gregorius, Hermogenes, and Theodosius. Towards the end of the ninth century, Basilius, Emperor of the East, issued a new code, intended to supersede the labours of Tribonian, termed the "*Basilica*."

In the dark ages, however much of the Roman law may have remained in practice, it had died away in literature, and was neither studied nor commented on. At the taking of Constantinople in the fifteenth century, only one copy of one of the Justinian labours, *the Novels*, seems to have been discovered. It was long believed, indeed, in the learned world, that from the period of the Basilica to the twelfth century, the very existence of the Roman law was among the things forgotten. The circumstance of its resuscitation were found in a traditional anecdote, that at the seige of Amalphi in 1137, some Pisan peasants discovered a complete copy of the Pandects among the plunder, the melodious language, comprehensive philosophy, and clear definitions of which, so charmed the readers of that barbarous age, that its contents were immediately devoured with avidity and propagated with zeal. In Florence, a manuscript is still preserved, said to be the identical book with which this anecdote is connected, taken at the siege of Pisa in 1406. The essence of the tradition has been disproved by late discoveries, which show that the civil law was known previously to the siege of Amalphi.

The real revival of the civil law is to be traced in the history of the universities. Of these, Paris, Bologna, and Leyden, took the lead in the department of jurisprudence. Contemporary with, or immediately after the siege of Amalphi, lectures were given on the Pandects in the University of Oxford, by a teacher of the name of Vicarius. For reasons which we shall have to state when we come to treat of the laws of England, the civil law, thus early commenced, never made much progress in England. Nor, although the civil law was so prominent a subject of professional study in Scotland, has that part of the empire done much to elucidate the science. Both England and Scotland, indeed, have produced writers on the civil law; but with one or two exceptions, the British jurists are not among those names which become familiar to the readers on the subject, from the frequent reference made to them by subsequent commentators. The earlier modern civilians followed three oracles, Bartolus, Baldus, and Accursius, whose works, it is believed, the most enthusiastic admirer of the study would not now peruse, and who probably retain their chief celebrity from having been targets for the wit

of Rabelais. In the seventeenth century, more elegant and philosophical commentators followed, and the subject was pursued with zeal to the middle of the following century. A prodigious number of civil law books issued from the press during that period; and we have heard it asserted, that a complete collection of all the books published on the civil and canon law would make a library of two hundred thousand volumes. The labours of Godefroy alone are sufficient to make a modern literary collector shudder; and there is perhaps no surer mode of comprehending what human patience and perseverance is capable of, than the contemplation of a civil law library. Holland has been profuse with great authorities: Grotius, Matthæus, Schulting, Noodt, Voet, and Huber, belonging to that country. Germany produced the philosophic jurist Puffendorf, and Heineccius, whose elementary works, as the clearest and most methodical of the commentaries, have been popular as class-books of civil law. Among modern investigators in this science, the Germans have taken the lead.

To give a general outline of the Roman law, would be to describe the common principles of the majority of the codes of civilized mankind. Although the progress of commerce and manufactures has introduced a quantity of transactions—such, for instance, as bills of exchange—which the Roman lawgivers could never have contemplated, yet their system is the foundation of all the commercial laws of Europe, a circumstance which has probably facilitated the uniformity so necessary in transactions which involve inhabitants of different countries. From the same source, Scotland and the greater part of continental Europe have derived a marriage law so different from the ceremonious system that prevails in England. Its leading principle is, that the consent of the parties alone is necessary to a valid marriage, and that when that is proved, nothing more is necessary; and that a child born between parties who are subsequently married, becomes legitimate by that act. The law of trusts and of the mutual rights and obligations of guardian and ward have found their way, more or less, into every modern system, and even into the statute-law of England. Prescription, or the principle that claims are limited by the lapse of time, has come down to us from the Romans. The law of testaments and the descent of movable property is mainly derived from the same quarter. It is in the case of the tenure and transmission of land, indeed, that the person versed in modern systems will find himself least at home in the Roman, from the effect which the feudal institutions of the various nations of Europe have produced on that branch of the law. The subjection in which children were placed to their parents is apt to create surprise, even when compared with the strict filial etiquette of our own ancestors. A revolting feature of the *corpus juris* is the portion of legislation devoted to the subject of slavery and the property in slaves.

The Roman law has already been mentioned as the source of the law of nations, or, as it is more justly called, the international law, in modern Europe. It was quite natural that a system voluntarily adopted among nations for regulating their mutual intercourse, should be founded, to as great an extent as might be expedient, on the system of the internal laws which the majority of the nations had chosen to adopt. But the law of nations is perpetually varying with circumstances, and it is impossible to draw that distinct view of its nature and provisions which may be given of the laws of any particular state. It has been argued, indeed, that the term "law" is improperly applied to the system. Wherever the term law is used, there is understood not only a regulation laid down, but a means of enforcing it in the hands of a superior power. The civil and criminal laws are enforced by the ordinary courts; the military law by courts martial; the law of the church, by the ecclesiastical courts, &c. But who, it is said, is to be the judge to enforce the law between nations? When two nations have a dispute, and their power is equal, it remains undecided; if the one is much superior in strength to the other, it has matters its own way. In the late war Great Britain maintained that she had a right to search all neutral vessels, for the purpose of ascertaining if they contained contraband goods or sheltered deserters. The smaller states were bound to submit; but America resisted, and the dispute occasioned a bloody war. So it probably will be again, when the same claim is urged. Instead of being a fixed law applicable to all, the weak will have to obey, and the strong will resist. For the enforcement of any rules that may be called the law of nations, then, it is clear, that there is no better sanction than this, that the powers which openly outrage them will call forth a degree of indignation on the part of the rest of the world which may prove dangerous. The partition of Poland, for instance, called forth the indignation of the rest of Europe; and it may be still a question whether the requisition was a prudent one to the nations concerned. It is not to be supposed, however, that there are no courts where the law of nations is enforced. Each country in Europe has generally a court where its own views on the subject are laid down. England has, for instance, the prize jurisdiction of the Court of Admiralty, which is thus called a civil law court. During the late war, when Napoleon by his Berlin decrees declared Great Britain and her colonies in a state of blockade, and Britain retaliated by the orders in council on the rest of Europe, a multitude of cases where the ships of neutral powers had been seized for breach of neutrality were adjudged. And here a circumstance occurred which could not take place probably in any other country, that the view taken of the law of nations by the judge was different from that taken by his government; for Lord Stowell declared that a blockade could not be held to exist by mere proclamation, but that there must be present on the spot an armament sufficient to enforce it.

One of the principal defects of the writings in the civil law, and one that renders the subject in a great measure unpopular at the present day, is the spirit of speculation with which they are imbued, and the extent to which they carry divisions and arrangements which are of no service in practice, and provide for wants purely hypothetical. The civilian in his study, shut out from the world and ignorant of its pursuits, set his brain at work to create the various exigencies of practical life to which the maxims of the institute were applicable, and to devise how they could be applied; but when his labours were brought to the light of day, it was found that the world in its practice and he in his thoughts had taken totally different routes, and that the one could not be the companion of the other. If a tailor make clothes with another man's cloth, to which of the two shall they belong? If an artist paint on another man's canvas, who shall be the proprietor of the picture? Such were among the subtleties discussed among the Roman jurists. In later days, when legislators have too much to do in keeping up with the practical demands of society to indulge in hypothetical law-making, such subjects would not be taken up until cases of difficulty actually occurred; and then, before deciding the abstract questions, it would probably be asked under what circumstances tailors are likely to make garments out of cloth which does not belong to them, or artists to paint on other people's canvas!

THE CANON LAW.

The Canon Law is, properly speaking, the ecclesiastical law of the Roman Catholic Church. In its more limited acceptation, it may be called the by-laws of the church as a separate corporation; but its field widened

with the influence of the hierarchy. It embraced many subjects of purely civil and municipal law, such as the distribution of property between married persons, succession, &c., by linking them with ecclesiastical matters; and thus the clerical tribunals came to rival, if not to excel in importance, those of the state. The canons of the Greek church, a portion of which were said to be the work of the apostles, added to and explained by general councils, were sanctioned by the Novels of Justinian, and have so been viewed as a portion of the body of civil law. A collection of canons was made in the year 520; and this work, with the papal decrees, and the privileges conceded to the church by Charlemagne, formed the chief subject-matter of the canon law down to the twelfth century. It was then that this law ceased to be the mere regulations of a peculiar body, and became a general system of jurisprudence. About the year 1114, a collection of the decrees of popes and cardinals was commenced by Ivo, Bishop of Chartres, and was revised and completed in 1149 by Gratian, a Benedictine monk. Another element in the system consisted of the Decretals which were rescripts or epistles by the pope, or by the pope and cardinals, deciding how the law of the church stood concerning disputed matters referred to them. These were first collected and edited in 1234 by Raimond de Renafort, chaplain to Gregory IX. This work was divided into five books, to which a sixth was added under the auspices of Boniface VIII. in 1298. These two great works, with some additions made to them by succeeding popes, formed what, in imitation of the collected works in the law of Rome, was called the *Corpus Juris Canonici*, or body of the Canon Law. Besides these general statutes, there were local canon laws passed by the clergy of various countries, at national or provincial assemblies, held under the auspices of papal legatees or archbishops. In the reign of Henry III. there were assemblies of the former kind; and under the respective archbishops of England, there were frequent provincial synods. In Scotland, two provincial synods, held at Perth in 1242 and 1269, passed some important laws regarding tithes.

The great aim of ecclesiastical legislation was to bring civil questions within its pale. Disputes as to tithe and the privileges of the clergy came very naturally to its hand. The priesthood were in a great measure intrusted with the administration of legacies, especially where they were destined to pious uses; and they thus acquired a jurisdiction in questions of succession, of which we see vestiges in this country, in the Court of Arches and the other ecclesiastical courts of England, and the commissary system in Scotland. Marriage being constituted a sacrament, the canon law not only took into its hands all questions regarding the union and separation of the parties, but adjudged in the criminal act out of which the latter circumstance might arise, and took under its cognisance questions as to dower. The church obtained a powerful hold over the proceedings of ordinary courts of law, by the introduction of the practice of witnesses and parties calling God to attest the truth of their statements—the origin of the present system of administering an oath. Over this ceremony, and all matters connected with the truth or falsehood of the statement it sanctioned, the clergy took a particular charge. Notaries, who in the days of ignorance were intrusted with the execution and registration of contracts—who, in fact, were the living registers of almost all transactions of importance, were necessarily taken from the only class who could write—the churchmen, and their appointment and removal naturally fell into ecclesiastical hands.

A great rivalry thus existed between the civil and the canon law; but it was a friendly rivalry. The clergy were the repositories of both systems, and they had to decide how much should be assigned to the one and how much to the other. The canon law borrowed largely from the civil, of which it is sometimes considered a mere branch; it was naturally, indeed, the object of the clergy not so much to change the law itself, as to take the administration of it into their own hands. To be *juris utriusque doctor*, or doctor of either law, civil and canon, was a common distinction. During Henry VIII.'s reign, lectures on the canon law were abolished in England, and with them the corresponding degree. Jealous as the English were of the encroachments of the civil law, they still more determinedly opposed that of the canon. What the powerful court of Rome had set its heart upon, however, could not be wholly resisted; but it was always a principle, that though the civil authorities of England might take laws from the ecclesiastical system, the canon law was never, in its own simple authority, to be obeyed within the realm.

THE FEUDAL LAW.

The feudal system and the Roman law may be said to have struggled for supremacy through nearly the whole of modern Europe. Of the influence of the latter we have already taken a cursory view. The former was an ingredient in the constitution of the continental and British monarchies. It was the source of those popular or aristocratic assemblies, which shared, more or less, according to circumstances, the government of the various states in which they existed; and it was thus the ostensible origin of the British parliament. Trial by jury has been traced to a similar source. The constitution of the German empire is essentially feudal, and the customs, or peculiar local laws of the various provinces of France, previously to the revolution, were models from which the system was studied. The English law, especially that of real or landed property, is full of feudal usages, though their operation has often been checked. In Scotland, the forms of the feudal system may be found existing in almost original purity, though, as we shall hereafter see, they have been adapted, perhaps as far as they are capable of being so, to the wants of civilized times.

An account of the rise and progress of the Roman law must, for obvious reasons, be far more satisfactory than any that can be given of the feudal system. The former was (at least the greater part of it) the construction of ingenious individuals, possessed of authority to enforce their mandates on their fellow-beings. The latter gradually rose out of circumstances, and the state of society. It was not devised by a powerful legislator, to be promulgated to a willing people; but it rose out of habits and events which took place in an age when there were no historians to record their progress. Hence, the origin of the feudal system has been a fruitful system of debate and theory; and in the absence of facts, it has often been necessary to resort to moral deductions. It has been maintained by some, that nothing can be more simple than the feudal system; that it was a mere arrangement by which military service was given in exchange for land, and that many half-civilized nations present instances of a similar contract. Ingenious speculators have found the resemblance of the system in particular stages of the history of Greece and Rome, in Turkey, Persia, Hindostan, and the Highlands of Scotland, among the aborigines of North America, and in the Loo-choo Islands. But, however important may be the investigation of such analogies between the practice of mankind under different circumstances, as a part of the history of the human mind, they throw but little light on the feudal system, the chief interest of which is to be found in the vastness of the field which it covered, and the influence which it has exercised for so many centuries over the legal institutions of Europe.

Since we can only say that this system existed, and cannot tell, as we have done in the case of the Roman law, the precise hands from which it came, it may be

better to commence with some account of its leading principles, reserving for after detail a history of its progress. The essential elements of the system were land, and military service given for the use of it, by the vassal who held it, to the superior of whom it was held. It would be wrong to speak of either of these two parties as the absolute proprietor of the lands; for, in the more perfect stage of the system, each had his own peculiar privileges, with which the other had no right to interfere, except where the law permitted him. The vassal was not, in the general case, the slave of the superior. The duties and services he had to perform were regulated by compact or custom. On the other hand, however, he was not the independent proprietor of the lands he held. He could not convey them to a purchaser, nor could he pledge or bequeath them, without obtaining the sanction of the superior to the person to be substituted to him. Land was thus completely removed from the operation of commerce; and in those countries where the feudal system continued to exist, it was only by fictions and connivances—by bribing the superior, or getting the courts of law to compel him to give his consent—that sales and pledges could be effected. The lands held in this manner were termed *fiefs*. When they became hereditary, as they did apparently by custom, arising from the tacit consent of the parties interested, the superior was still presumed to give an assent to the change from father to son; and before he acknowledged the latter as his vassal, he exacted from him a fine. When the successor was a minor, and thence unable to fulfil the military duties of the fief, the superior in some cases became his guardian, drawing the rents of the estate, and compelling him to marry whom he should point out, under a penalty, which, it would seem, ought to amount to the sum which the guardian, or superior, could receive by selling the alliance. The superior's claim upon the estate during the vassal's minority, became, like most other feudal exactions, fixed by usage, and seems in general to have amounted to one year's rent of the land. In some countries, females could not succeed. In others, where their right was acknowledged, the superior claimed the privilege of assigning husbands to them; and exacted a fine, sometimes for admitting the husband as a new vassal, sometimes as the price for permitting him to marry his ward. The feudal system, like every other, had its degrees of goodness and badness. Where we find the milder features of the feudal law, the right of the lord over his female vassals, or the wives and children of his followers, was a mere tax; but where the darker influences of the system were at work, it gave legality to a licentious despotism, which is frequently adduced as a disgusting memorial of the barbarism of feudality. Of illustrations of despotism, indeed, the feudal system is full. Independently of its own peculiarities, it would have been impossible for any legal system to have passed through the scenes of rapine, blood, and barbarism which characterized the middle ages of Europe, without being the instrument of many iniquities. At the outbreak of the French revolution, which at first was little more than an attack on the most offensive relics of feudalism in France, some of these horrors were dragged from their dingy retreat in parchment records and black-letter chronicles, to add to the frenzy of the times. Among other instances, was adduced that of a feudal lord, on his return from the chase in winter, disemboweling a vassal, that he might keep his feet warm in the reeking trunk during the evening revel.

The proper return of the vassal for his lands and the protection of his lord, was, as already stated, military service. Where this system was established as a fixed law, the quantity of service to be so given was regulated. A knight's fee imposed on the holder the duty of being forty days in the field for his superior, and the half or quarter of a knight's fee involved corresponding proportions of service. When fiefs came first into existence, it is probable that there was no other service worth possessing but the use of the strong arm. Conquered land was what the chief possessed, men to fight more battles was what he wanted; so that the one became the price of the other. It was not always the case, however, that land was valuable for nothing but as the reward of fighting, and it was gradually bestowed for other considerations; yet so closely connected had the relation of a military tenure become with land, that any other method of disposal was considered as irregular, and merely exceptional. Hence, when land was given without a price, and for the understood return of military service, it was said to be a proper feu; when any other consideration, such as a sum of money, was stipulated for, it was said to be improper. The former was always presumed to be the condition on which land was given, the latter required to be specially proved, and the unwillingness to admit it called for those legal subtleties which have made the commerce in land, to this day, so complicated. It behoved that there should be possessors of land who were not of necessity soldiers, and it was necessary to the monarch, or feudal superior, to employ people in various other capacities. All, however, took the impression and stamp, as it were, of fiefs. Salaries, taxes, honours, and dignities, even board and lodging, were feued out; the person who had engaged to bestow them acted the part of superior, and he who received them that of vassal. The church enjoyed lands which were not exempt from the ordinary feudal services. In the earlier ages, churchmen in many cases themselves assumed the spear and buckler. When it was considered inconsistent for churchmen to fight, it was held as by no means unsuitable for the church to employ soldiers. A clerical establishment would sometimes appoint a patron, or chivalrous assistant, in the person of a neighbouring baron, who would be called the "advocate" of the establishment—the use, by the way, to which that word, which now designates a class of peaceful lawyers, was first applied. It is not unfrequent to find in old tenures that a particular monastery is to supply so many archers and spearmen for so many days.

Borough communities were another class to whom military service seems inapplicable, but who, nevertheless, almost universally held by that tenure. They obtained certain privileges, and in return they had generally to keep watch and ward in their respective towns; a service in which their own safety might not be less interested than the ambition of their lord. As the privileges conceded to these communities were large and important, they did not, in general, escape taxation along with their military duties; and in later times these exactions became generally commuted for a money payment The privileges usually conceded to these commercial communities consisted of an exemption from the more vexatious of the feudal exactions, to be shortly noticed. These were generally conceded to them by the monarch, as a counterpoise to the growing power of the feudal aristocracy; and within these sanctuaries commerce and civilization created a power, by which both kings and nobility were effectually held in check.

Among those who were placed in the position of feudal vassals to the seignior, or lord, were his own domestic servants, whose power and influence would be, to a certain extent, measured by that of their master. To perform the menial duties of his household, a Roman emperor employed a slave, just as a senator or a proconsul might do. The barbarian conquerors, however, gave lands to those who performed these functions; and the person who performed for Charlemagne the office of butler, valet, huntsman, or groom, got for his services the commodity most readily at his master's hands—portions of conquered territory. The services were thus performed as the consideration for feudal benefices. The

menial servant of the monarch might have tenants and retainers under him; and thus the wages ennobled the functions. Hence we have had, in modern Europe, masters of the robes, grooms of the stole, masters of the buckhounds, masters of the horse, &c., held by the highest nobility of the realm. The *graf*, or land-steward of a district, was an important personage. Instead of attending to the letting of paddocks, and the rotation of crops, he was intrusted with the power of life and death over the inhabitants. The humble grieve, who has the management of a small landed estate in Scotland, and the shire-reeve, or sheriff, who performs high judicial functions in the same part of the empire, have divided, as it were, between them the original duties of the feudal officer from whom their names are derived. The same feudal origin may be as distinctly traced, on a larger scale, in the relation of master and servant in modern times. Servitude, however menial, when allied with feudal dependence, did not carry the same degradation as mere slavery; and in the opinion of some, the situation of the feudal attendant was higher than that of the menial servant of modern days, who freely gives his labour and attendance for a price. In Scotland, where feudal usages have lingered so long, it has been remarked, that the relation between master and servant is of a more confidential nature than it is found to be in other parts of the country. While the line drawn between their positions is as clear as it can well be in a free country, the situation of the servant has a more than ordinary share of respectability attached to it, because, instead of being the individual servant of an individual master, he and his race are looked upon, to a certain extent, as the retainers of the house which he serves. On this point, indeed, an adherence to feudal usages in situations to which they are not applicable, has been productive of one of the greatest evils of modern society—the extent to which servants are kept, not for use, but as an ornamental evidence of wealth. Our lineal aristocracy continue to follow, so far as the usages of the day permit, the practice of their ancestors; and the gentlemen of plush and shoulder-knots are the representatives of those who wore buff jerkins, and handled the pike. The rich merchant and manufacturer must not be without the usual insignia of wealth; and thus a race, whom idleness and constant association with each other must deprave, are kept up among a bustling and active community, as if we lived in the days when the majority must either serve or starve. It has been remarked, that in republics such as Holland, the wealth of rich individuals generally took the more ennobling direction of patronising the arts and literature.

In the earlier ages of the feudal system, when there was much land to distribute, the natural features and boundaries were sometimes little known to those who gave it away. The persons who received it were aggrandizing and ambitious, and not likely to yield to each other disputed portions. Above all, the conquerors were uneducated, and had little means of giving perpetuity to their bounty by written deeds. From all these circumstances, the investiture of the vassal became a very important and solemn affair. Investiture was divided into proper and improper. By the former, the superior went in person to the land, assembled all his other vassals upon it, and showed them the portion he had assigned to his new follower. The vassal, upon this, did homage, accepting the grant, and promising to perform the usual services in return. By the improper investiture, of the full practice of which in our day we shall give an instance, the superior gave authority to his bailiff, or some other person, to give investiture, which was done by the symbolical delivery of a portion of the property—some earth and a piece of stone generally—to the vassal, or some person authorized by him to accept the grant and perform his homage. Writing was probably in use before this latter usage was commenced, and the authority was generally a written one. The solemn investiture in presence of the co-vassals finally descended to a mummery between an attorney and his clerks. The necessity to have acts regarding the fiefs of a superior witnessed by his vassals, can be traced to a connection with two of the most important institutions of modern times. The great vassals of a king met together in public assembly to discuss what aids they might afford for their fiefs, how they were to defend them, &c., merged into a great council or legislature; and it is to such a body that the British Parliament at least partly owes its origin. At this moment, the Bishops of England sit in the House of Lords in virtue of the feudal baronies which they hold of the crown. Vassals of the lower grade were often summoned to attend at the hall of their lord as assessors, or assizers, to give, partly opinion, partly evidence, concerning some matter connected with the fief, or the conduct or rights of a fellow-vassal. With this institution, the system of trial by jury is intimately connected. A jury of perambulation, for the purpose of ascertaining boundaries—a sort of body lineally descended from the assemblage of co-vassals who were present at the investiture, and witnessed the extent of the gift—has been known in modern times.

It is probable, that if the feudal system had only established a relation between the monarch and his immediate vassals, the influence it would have exercised over the state of Europe would have been comparatively slight. The distribution of land as the reward of services is frequently exemplified in history; but that which chiefly distinguished the feudal system, is the numerous grades of dependence, and the manner in which all parts of society, from the emperor to the lowest serf, were bound together in one system of lord and vassal. In the first place, there were various grades of vassals holding of the monarch. The majority of the lower classes, however, generally found themselves under the protection of some intermediate chief. The duke, or count, who held immediately of the crown, sub-feued to a dependant, who, on his part, might dispose of a fragment in a similar manner. By such an alienation, however, the vassal dared not in any way interfere with his superior's rights; the latter, indeed, was not presumed to be conscious of the sub-infeudation, unless he had specially sanctioned it, and by doing so, he acknowledged the sub-vassal as his own immediate retainer. When a vassal, therefore, sub-feued without his superior's consent, he gave only a portion of the estate he himself possessed, his sub-vassal being liable to meet all the exactions that might fall upon him. So, if he rebelled against his lord, or withheld the feudal exactions, the superior could seize upon the fief without reference to the claims of the sub-vassal. The highest feudal noble was the Heretoch, who, from the Latin *dux*, a leader, received the designation of duke: this class was intrusted with the administration of large provinces. The graf, who had a smaller charge, was called *comes*, or count; and one class of graf, who was intrusted with the marches, was called the *mar-grave*, *march-graf*, or marquis. These nobles generally held lands of their sovereign, while they were authorized to represent his person over the districts to which they were assigned, administering justice in his name, levying his feudal exactions on his vassals, and receiving their homage. These powerful feudatories were held in check by Charlemagne; but under his successors, and the other European monarchs, it became their aim to be the independent sovereigns of the territories committed to their charge—an object in which they were more or less successful according to circumstances, some throwing off their master's yoke, while others made themselves intermediate superiors between the king and his vassals. The various states of Italy and Germany are illustrations of the working of these events. The feudatories of France

made a very near approach to independent sovereignties. They possessed within their own dominions the right of coining money, that of waging private war, exemption from all tributes, except the limited feudal duties by which they acknowledged the superiority of the crown, and finally, freedom from legislative and judicial control on the part of the sovereign and his courts. The vassal, too, in looking after his own concerns, sometimes conquered territories not inferior to those of his lord; and under such circumstances there was little chance of his being an obedient retainer. The Duke of Normandy, the vassal of the King of France, became monarch of England, and the Dukes of Burgundy were little less powerful.

From these high personages, vassalage went through many gradations till it reached abject slavery. There were the *vavassors* and *châtelains*, dependants on the higher nobility, but who themselves had large estates and fortified their houses. There were the burghers of free towns, whose privileges have been already mentioned. Of rank corresponding in the rural districts, were the *socage-holders*, and the class so well known in England by the designation *yeomen*. The lowest grade were the *villeins* or *serfs*, to whom was committed the task of tilling the lands which the soldier gained or protected. It was the characteristic of the other grades of feudality to impose duties upon the lord, corresponding to those of the vassal, but the villein had little power to exact performance of these regulations. There were grades, however, even among the serfs, though probably there were not instances in which one held of another as vassal and superior. The peculiarity of the class was, that they were astricted to the domain, and went with it when it changed hands. Some, however, had rights and privileges which they might maintain in the court of the manor of their lord. Some held small estates, which, however, they could not dispose of. The lowest class were as abject as the slaves of the Romans.

The different classes of feudal taxes have been mentioned above. There were others, however, of a more miscellaneous nature, which were chiefly encroachments on the purer spirit of feudality, dictated by despotism and cupidity. It was upon the vassals who approached nearest to the state of villeinage that these innovations naturally fell most heavily. They were designated "aids," and were demanded by the lord on any occasion which caused him outlay. If he had to make war with a neighbour, or to portion off a relation in marriage, or to ransom a son, he demanded an aid. Aids were profusely exacted by the knights who joined in the crusades. In England, the aids that might be exacted were restricted by *Magna Charta* to three; they were for the purpose of making the lord's eldest son a knight, for marrying his eldest daughter, and for redeeming his person from prison. By exactions in a different form, the more servile vassals were fleeced and kept in subjection. The superior, if he built a mill, astricted all his vassals to grind their grain at it, compelling them to pay a tax for the service they were forced to receive. He compelled them to assist in making roads and building bridges, and he exacted tolls of all below the degree of freeholders who crossed them—a system which placed impediments in the way of vassals escaping from place to place. He obtained tolls and duties, too, on the export and import of commodities; and if he found a clever artisan on his premises, he would keep him and his services for his own use.

The revival of literature was not favourable to pure feudalism. It brought with it the study of the civil and canon laws, and it was through the lights so acquired that the feudal customs were interpreted. The decline of the spirit of the feudal law is matter of history, and a view of it would lead to too long a digression. Not only its effects upon society, but its literal forms, still linger among us; even in republican America there is pride of birth, and a knowledge of the feudal system is sometimes requisite in ascertaining the title to property. Perhaps in no country has the letter of the feudal law been so curiously adjusted to the needs of modern society as in Scotland. As a general illustration of the system, we have drawn up from the notes of a professional friend the following outline of the manner in which land is conveyed and held in that part of Britain. All the land in Scotland is held of the crown, and the greater portion of it is possessed by vassals of the freeholders. Let us suppose one of these vassals selling a portion of his property, for a sum of money down, or an annual payment. There is only one side to the contract—that of the seller, for as he is going to act the part of a feudal lord giving away a benefice, it would be quite inconsistent for the buyer to come under any obligation to take the lands and pay for them. The seller, in a formal document, states, that he makes over the lands, and dictates what series of heirs they are to descend to, and how they are to be held. He then grants an authority to his bailiff to pass to the lands described, and invest the purchaser with them. The investiture is generally managed thus: A notary-public and four other persons repair to the grounds; one of these acts the part of the bailiff, or feudal officer of the seller, or superior; another that of the vassal's representative. The authority is read over, and then the bailiff, with all due solemnity, lifts a stone and a piece of earth, which he puts into the hands of the vassal's representative, who "takes instruments" in the hands of the notary by giving him a shilling, or protests that the ceremony is completed, calling on him (the notary) to attest it. The other two parties are the witnesses. This makes the buyer the vassal of the seller; but it is generally preferable to be in exactly the same position in which the seller was. To accomplish this, the consent of the seller's superior must be had, and according to feudal usage, it is thus signified. In virtue of an authority, or "procuratory," a representative of the seller goes to the superior, or his representative, and by the symbol of a "staff and baton," as the law-books say, but practically of a pen, the lands are delivered into the hands of the superior, who transfers them over to the purchaser by handing the pen to him or his agent. Then follows an investiture by the superior in the above form, which is conducted in virtue of a charter granted by him to his new vassal. To the superior this is not entirely a barren ceremony, for he receives a year's rent of the property to reconcile him to the change of vassals.

THE LAW OF ENGLAND.

England has already been mentioned as an exception to the general prevalence in Europe of the civil and canon laws; not that these systems were totally repulsed, but that they met with a countervailing resistance, which prevented them from obtaining the influence they possessed in other countries. This resistance may be found in the existence of a different, and, it may perhaps be said, hostile system, called the common law, and to the power of parliament to make laws or statutes. The three great elements of the jurisprudence of England are the common law, the law of equity, and the statute law. To these may be added, as codes limited to particular spheres, the admiralty law and the ecclesiastical law.

Speaking of the common law, Sir Matthew Hale, its historian, says: "This is that law by which proceedings and determinations in the king's ordinary courts of justice are directed and guided. This directs the course of descents of lands, and the kinds, the natures, and the extents and qualifications of estates; therein, also, the manner, forms, ceremonies, and solemnities of transferring estates from one to another; the rules of settling acquiring, and transferring of properties; the forms

solemnities, and obligations of contracts; the rules and directions for the exposition of wills, deeds, and acts of parliament; the process, proceedings, judgments, and executions of the king's ordinary courts of justice; the limits, bounds, and extent of courts, and their jurisdictions; the several kinds of temporal offences and punishments at common law, and the manner of the application of the several kinds of punishments; and infinite more particulars, which extend themselves as large as the many exigencies in the distribution of the king's ordinary justice require."

Common Law.—The origin of this system, one of the most interesting subjects of modern investigation, is involved in deep obscurity. Its progress, subsequently to the reign of Edward I., who has been called the English Justinian, is pretty accurately noticed; but when an unprofessional inquirer reads those portions of English law-books which attempt to carry the history to an earlier period, he cannot help feeling disappointed at the unsatisfactory result. The more marked features of the system were, doubtless, the customs of the Anglo-Saxons. A collection of the laws of England during the heptarchy, or laws of the Anglo-Saxons, was published by an eminent antiquary, at the commencement of the eighteenth century; but there is great reason to believe that they were written some centuries after the Conquest, while the fragments of Anglo-Saxon legislation which they contain refer chiefly to the arrangement of the military force, the clergy, and other matters of general or police regulation, which, in the present instance, are less interesting than a little insight into the laws relating to private rights would be. Alfred and Edgar have acquired much fame for having collected and emanced the laws of their predecessors, reformed them where they were impolitic, and completed them where deficient; but it would be difficult to determine their exact merits. Edward the Confessor enjoys a similar reputation. To him, indeed, history supplies us with good ground for referring equitable laws, for we find that when the people complained against the oppression of the Norman kings, they demanded "the good old laws of Edward the Confessor." It is probable, however, that the compliment did not apply to him so much in the capacity of a legislator as that of the last of the Saxon kings.

Whatever may have been the exact nature of the laws of the Anglo-Saxons, the Conquest effectually incorporated them with the feudal system, and the connection between vassal and superior became one of the most important features of the common law. It is not to be supposed, however, that this was the earliest visit of feudal institutions to Britain. The Saxons could not well escape the influence of a system which had deeply rooted itself among the kindred nations of the continent; and many feudal institutions are to be found existing under the Saxon kings. The increase of the spirit of feudalism under the sway of William the Conqueror was, however, so great, that many authors have attributed its origin in England to the era of the Conquest. It was then, indeed, that it became oppressive. The conqueror brought with him the system of his own province, for which he was a vassal to the King of France, and could not admit the possession of landed property in England, except as held from himself in the capacity of lord paramount. The greater nobles—chiefly the conqueror's companions in arms—naturally held the lands he liberally bestowed on them of him as superior, and they compelled all who lived upon their lands, or even in their neighbourhood, to acknowledge them as liege lords. The forcible increase of such a system as the feudal law, could not but be attended with acts of great oppression. These were added to by the selfish magnificence of the princes, who cleared large tracts of country of inhabitants, that they might enjoy the regal pleasures of the chase in undisturbed tranquillity. The Saxons had their own county courts, but the greater part of the causes were, after the Conquest, removed from them to be pleaded in the court of the monarch, which attended on his own person. Legal proceedings were conducted in the Norman dialect of the French, which was afterwards changed into Latin. The use of a tongue unknown to the people at large, continued down to the days of Oliver Cromwell, and at the restoration was restored, with other equally useful practices. It was abolished in as far as respects the proceedings of the courts of 1730.* If we knew nothing of the veneration with which the Saxons looked back upon "the good old laws of Edward the Confessor," the obstinacy with which they preserved their language would have led to the presumption that they had been equally tenacious of their ancient customs. The former outlived every attempt, moral, intellectual, or physical, by reprobation, sarcasms, or force, to extinguish it, and so, to a certain extent, did the latter. The judicial system, and the tenure of land, might both be altered; but to their original customs the people adhered so resolutely, that these were at length blended with the opinions and feelings of their Norman tyrants, and became to a certain extent the system of law which they administered. There was a further leaning on the part of the barons to the popular customs, from this circumstance, that the priests, whom they viewed as dangerous rivals, attempted to introduce the doctrines of the civil and canon laws. Hence it was, that at the parliament of Merton, in the thirteenth century, when an attempt was made to legalize the principles of the civil law with regard to marriage, and some other important points, the barons made that memorable declaration. "We will not change the laws of England"—words which, like every expression that becomes celebrated, have been used to very absurd purposes.

The charters that were so often granted by the earlier kings to the importunity of their subjects, were partially restrictions of the tyranny of the feudal law, and partially promises to adhere to the old Saxon customs—promises which would not have been so often exacted if they had not been continually broken. The most celebrated of these is that conceded by King John, called Magna Charta, or the Great Charter. Its privileges are, in a great measure, constitutional, and it has often been said that it was procured for the advantage of the aristocracy, and not of the people; but it is not without stipulations in favour of the latter, protecting them both from the crown and the nobility. It restricts the tyrannical forest laws, and the exactions by feudal lords from their vassals. The clause which has attracted chief interest, however, is that which says that no freeman shall be affected in his person or property, save by the legal judgment of his peers, or by the law of the land. Legal writers have found a stately tree of liberty growing out of the seed planted by this simple sentence. They see in it the origin of that judicial strictness which has kept the English judges so close to the rules laid down for them in the books and decisions of their predecessors. The judgment by peers is said to refer to jury trial, and it is urged that the whole clause strikes against arbitrary imprisonments, and involves the principles of the *habeas corpus*, by which every man, whose liberty is restricted, may demand to be brought before some competent court, that he may be either convicted or liberated. The great

* For many purposes connected with legal practice, Norman continued to be employed—law-books were written, and cases reported in it. The following specimen of a formal document of the end of the sixteenth century gives a grotesque picture of the manner in which languages were twisted to suit the convenience of those who used them:—

"Fuit resolve per le pluispart de les justices et le counsell del Roigne, cest terme à Sergeants Inne, in presentia comitis Sussex Justic. Forestar extra Trentram, que le building dun novel Meuse in le severall soyle on waste daseun home deins un Forest, est un purpresure et noyance al Forest et Game, et finable ou arrenable, pour le tolleration ou permission de ceo destroyer al arbiterment et discretion del justice, ou tenable et destrue al pleasure," &c.

charter has always been a favourite object of veneration, both with the aristocracy and the people, and Sir Edward Coke reckons thirty different occasions on which it was ratified.

Civil liberty may be defined as the permission of such an amount of free action as it is most conducive to the welfare of all that each individual should possess. This is one of the most important objects of the laws, and the circumstances which conduce to its existence are among the most interesting in legal history. In England, the progress of liberty has been in a great measure attributed to the division of interests in the country. The crown had an interest in checking the power of the great nobility. That the exercise of this power was essential to the liberty that has existed in England, is apparent in contemplating the state of France and Germany, where the aristocracy made themselves either quite or nearly independent of the crown, and revelled in the tyranny of their despotic will unchecked. A very important blow to the power of the aristocracy was accomplished by Edward I. in 1290, by the abolition of the system of sub-feuing. From that day, no vassal of the crown could grant lands to be held of himself, as he may to this day in Scotland—he could only put a new vassal in his own place, as an adherent of the crown. There is evidence that a similar law was passed in Scotland, but the crown was not strong enough to enforce a law that deprived the aristocracy of the dear privilege of being petty sovereigns. The disputes with the church were not without their service. The attempts of the ecclesiastics to urge the claims of their Roman and canon laws, caused the common lawyers to isolate themselves from the slavish doctrines of these systems, and to resist their encroachment with true professional hatred. It was in the universities, of course, that the clergy had their chief influence; and the students of the common law formed themselves into rival institutions, from which originated the Inns of Court. Then there was in the boroughs a separate interest, powerfully pointing towards freedom, and possessed of an influence not to be despised. The tendency of all these circumstances seems to have been, a gradual return to Saxon freedom, and a fixing of the common law in conformity with the long-cherished feelings of the English people.

That strong-minded and clear-headed man Edward I., whose ambition was so heavy a curse to his neighbours, took a great stride in the establishment of the common law. Of his reforms, as enumerated by Blackstone, we give the following specimens:—"He established, confirmed, and settled the Great Charter and Charter of Forests. He gave a mortal wound to the encroachments of the pope and his clergy, by limiting and establishing the grounds of ecclesiastical jurisdiction; and by obliging the ordinary, to whom all the goods of intestates at that time belonged, to discharge the debts of the deceased. He defined the limits of the several temporal courts of the highest jurisdiction—those of the King's Bench, Common Pleas, and Exchequer—so as they might not interfere with each other's proper business; to do which they must now have recourse to a fiction, very necessary and beneficial in the present enlarged state of property. He settled the boundaries of the inferior courts in counties, hundreds, and manors, confining them to causes of no great amount, according to their primitive institution, though of considerably greater than by the alteration of the value of money they are now permitted to determine. He secured the property of the subject, by abolishing all arbitrary taxes, and talliages levied without consent of the national council. He guarded the common justice of the kingdom from abuses, by giving up the royal prerogative of sending mandates to interfere in private causes. He instituted a speedier way for the recovery of debts, by granting execution, not only upon goods and chattels, but also upon lands, by writ of *elegit*, which was of signal benefit to a trading people, and upon the same commercial ideas, he also allowed the charging of lands in a statute merchant, to pay debts contracted in trade, contrary to all feudal principles." This last-mentioned reform refers to measures for enabling a creditor to get possession of his debtor's land in payment of his debt. How opposed such a remedy would be to feudal principles may easily be conceived, and the boldness with which Edward made his reforms will be felt when it is considered that what he had thus commenced was only completed in 1833. If the debt of a landed proprietor were not substantiated by some bond or other document, his land could not be applied in payment of it on his decease, and it was only in that year that landed property was made fully available for "simple contract debts." The statement that Edward imposed limits on ecclesiastical jurisdictions, refers to the authority which the clergy arrogated regarding wills—mentioned under the head of the canon law. Edward allowed them the charge of the deceased's effects, but compelled them to employ the money in paying his debts.

From the period when we discover any branch of the common law in existence, we find its observance rigorously enforced by the judges. Of course, they had very frequently, as society progressed, to apply it to the wants of an age very different from that in which it was invented; but, in doing so, instead of directly altering the law, which they always viewed as beyond their power, they accomplished the change by a manœuvre almost peculiar to the law of England, called "a fiction." A fiction may be defined to be the taking for granted that a thing has been done which has not been done, and acting accordingly. For instance, if a man had taken an article in loan or on hire, and refused to give it up to the owner, the legal remedy, by the common law, was a very complicated one. In the case, however, where a man had found another's property which he refused to restore, there was a very expeditious and distinct remedy. It occurred to lawyers, that the kind of process used in this latter case was the very thing that would be most suitable for the other; and therefore, when they brought an action against a person who thus wrongfully detained the goods of another, they stated that he had found them, and the judges, agreeing in the propriety of the form of action being applied to the purpose, would not allow the party to show that there was no finding in the case. Hence the well-known action of trover, from the French *trouver*, to find. Some curious illustrations of fictions of law will be given when we describe the method in which the courts acquired their jurisdiction.

Fictions were not, however, the only means by which the judges, while adhering apparently to the letter of the law, could adjust it to their own views of the wants of society. A far-seeing judge who looked forward to the probable rise of a new system of transactions, could, by a swaying of the principles of the law that might be quite imperceptible at the moment, adapt them to the new exigencies. It was thus that Lord Mansfield, without the aid of statute, created the law of insurance. There are frequently many underwriters, or insurers to a policy, and had the practice been as it was, each would have had to be prosecuted separately on the occasion of a loss; but Mansfield, by a very slight divergence from previous practice, brought all the claims in a policy into one action—an expedient without which the system as it at present stands could not have existed. This was accomplished by a rule of court known by the name of the consolidation rule, by which all the actions except one is stayed, on the various defendants becoming bound to abide by the issue of that action. In their covert efforts to change the laws, the judges did not spare even acts of parliament. They managed to hit a blow at the power of the aristocracy, by limiting the operation of the statute of entails. When the holder of the entailed

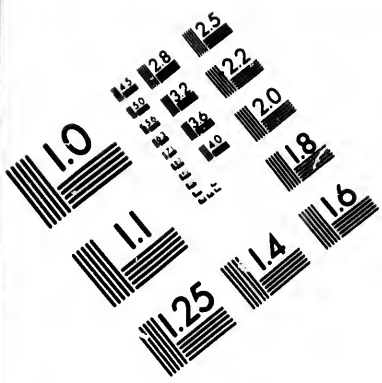
estate wished to sell it, he let the buyer bring an action against him, alleging that he had no title. He said he had bought the property from some one—usually the crier of the court—whose duty it was to support his title. The crier being called in, made default, and was nominally adjudged to give the holder under the entail an equivalent, with whom there was no effectual competitor, while the estate was adjudged to the purchaser.

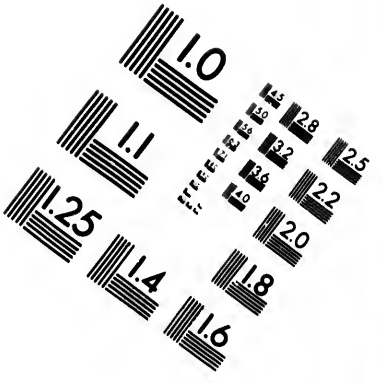
The repositories of the common law are the treatises of eminent lawyers and the reports of decisions. Of the former, there are several of the thirteenth and fourteenth centuries—Glanvil, Bracton, Hengham, and the book called Fleta, the authorship of which is unknown. Lyttleton's treatise on Tenures, the work of a more matured system, was long the text-book in the practice of the feudal law. It was in the humble form of a comment on this work, that the great Chief-Justice Coke issued the vast treasury of legal learning so familiarly known as "Coke upon Lyttleton," a book which is in itself an almost inexhaustible subject of study to the lawyer. The next great name is Blackstone, a man who brought elegant accomplishments to bear on the austere drudgery of the law, and wrote a book, the clear perspicuity of which has made many men acquainted with the laws of their country who would have otherwise remained profoundly ignorant of them. The book has one great defect, that, professing to be not merely an exposition of the laws but an estimate of their worth, it bestows indiscriminate eulogy on all the vices of the system as well as its advantages. The reverential eye with which English lawyers look upon whatever is ancient in the common law, is singularly apparent in the majority of law-books. If any great authority, such as Coke or Blackstone, has treated of a particular subject, whoever afterwards writes upon it seems to be held bound to incorporate all that he has said, not only in spirit but in words. As the passages are not marked as quoted, the effect is a very peculiar one; for the reader, after perusing a few sentences in the easy flow of the nineteenth century, finds himself unexpectedly entangled in the quaint language of the reign of James I., without the slightest hint that he is going to get, not the statement of the author himself, but something taken from Coke or Spelman. Of the reports of cases there is now a vast collection. From the time of Edward I. to that of Henry VIII., they were annually collected by officers appointed for the purpose, and were called Year-books. They have latterly been published by private reporters. As they are all precedents for guidance in succeeding cases, and therefore the source to which the public look for the interpretation of the laws they must obey, it may be questioned whether they should not be officially recorded by persons responsible for the accuracy of their reports. This plan has, to a certain extent, been adopted in America.

Law of Equity.—The peculiar strictness with which the common law was administered, gave rise to the other great division of English jurisprudence—the law of equity. This was originally a system by which relief was given in cases where a strict interpretation of the common law would have produced injustice. It could look to the influence of accidents and frauds when common law could not. A deed, for instance, was lost. The common law courts could hear nothing about what might have been its contents. They could see nothing, know nothing, act on nothing, but the express words of the deed as set before them, and as that could not be found, the party must suffer. Here the court of equity came to his relief, by compelling a "discovery" of the contents of the document. When a trustee was put in possession, common law could not look at him in any other light but as holding for his own behoof; but equity compelled him to do his duty to his employers. Where an obligation was to pay, common law could comprehend its nature and exact performance, but if it was to perform any other act, the assistance of equity was generally necessary. Again, the courts of law might give a remedy for a mischief after it had been perpetrated, but they could not interfere to prevent it. This necessary branch of legal administration came likewise within the jurisdiction of the judge in equity, who, on cause shown, could issue his "injunction."

The origin of this system is as obscure as that of the common law, though it is evidently of a more modern date, having been introduced as a remedy to the evils of the latter. The earlier law-books do not mention it, and it was probably long in operation as a sort of exception to the ordinary course of law, before lawyers would acknowledge it as a system. Its most plausible origin is simply this—that when a person suffered a manifest injury, which the ordinary courts could not remedy, he applied for redress to the sovereign in person. The king's conscience-keeper, or chaplain, became the referee on these occasions, and what he did he sealed, by way of testimony of the royal authority, with the king's seal. Hence the origin of the lord chancellor with his great seal, whose office, in this form, has been traced, or imagined to be, [illegible] far back as the days of Edward the Confessor. [illegible]nes, the chancellors were ecclesiastics, and they were in the habit of adjusting their equity, [illegible] in which they administered it, to the civil law, [illegible]sioned great feuds with the common law [illegible] at the commencement of the seventeenth [illegible]d so fierce, that in a case where a remedy was sought in equity from the proceedings of the Court of King's Bench, the lawyers who conducted the proceeding, and a master in Chancery, were indicted for an offence. With the assistance of King James, whose legal notions were derived from the civilians, the courts of equity triumphed. The great Sir Edward Coke was then at the head of the King's Bench—a man who, notwithstanding his harsh and tyrannical acts, must still be admired for the bravery with which he supported the strict administration of the law, however high might be the personage who wished to evade it. Whatever may have been the origin of equity, it became at last a fixed system of law. It is a popular mistake that a judge in equity gives his decision according to what is called "the general principles of equity and justice," without reference to strict rules. He is bound down by precedents and rules, and there are many acts of parliament which regulate his proceedings; so that, in reality, equity is but a department of the general system of law.

Statute Law.—We have now to speak of the third branch of the law—statutes, or acts of parliament. The constitution of the legislature by which they are passed does not belong to the present subject; it need only be observed, that to be law, every word of an act requires to have the consent of the three branches of the legislature—the sovereign, the lords, and the commons. In very early times, acts of parliament seem to have been petitions by the parliament acceded to by the sovereign. The parliament was convened to supply the king with money, and while it kept him in suspense, it sometimes prepared a petition against grievances, to which a needy monarch found it prudent to accede. It became a practice for the judges, at the end of a session of parliament, to convert the substance of the "petitions," or "bills," which had been acceded to by the king, into acts. This practice was fraught with manifest danger, the judges having the power, when parliament had ceased to sit, of altering the intended provisions. To remedy this, the plan now followed was adopted, of making the bill contain the exact words which it was intended should constitute the act. Singularly enough, the bill is still in the form of a petition, and when it is made an act, all the alteration that takes place is, that the words "May it therefore please your Majesty," are taken out. A bill may be in-





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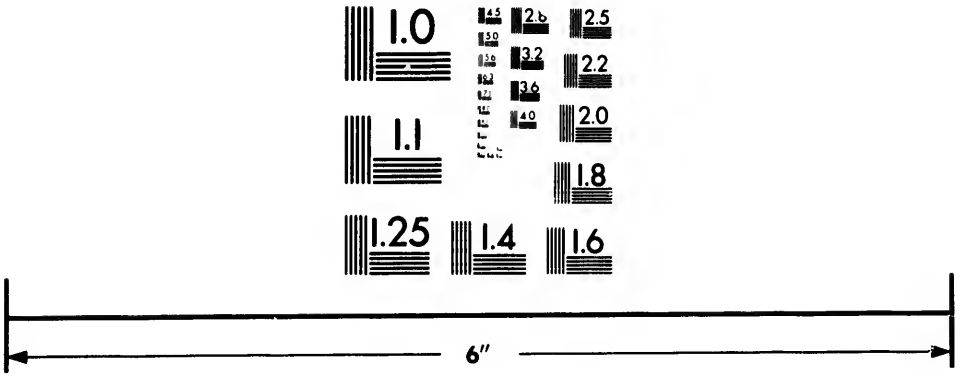

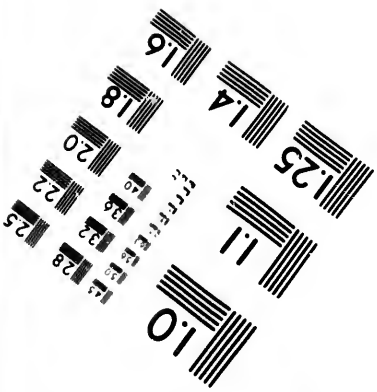

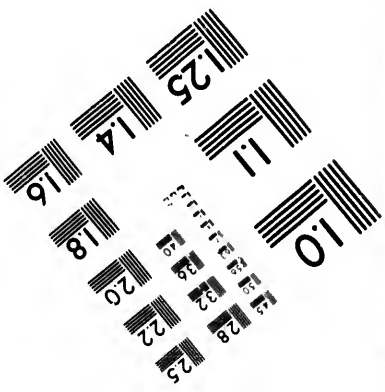

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troduced either in the House of Commons or in the House of Lords. It is a rule, that all bills affecting personal station—such as bills of attainder for treason, bills for naturalizing foreigners, &c.—shall make their first appearance in the House of Lords. The commons possess the more substantial privilege of originating all bills of supply, or for the levying and appropriation of taxes. The privilege is jealously guarded, and it is usual, should the House of Lords amend such a measure, for the House of Commons to refuse to take it into consideration again, and to authorize their speaker to throw it over the table. About seventy years ago, in the case of a bill for the protection of game, the House of Lords thought fit to raise the penalties higher than those sanctioned by the lower house, and as the money went to the exchequer, the commons considered this an infringement of their privileges, and acted accordingly. All measures involving taxation originate in what is called "a committee of supply," in which the house is presumed to be sitting, not to debate great questions, but simply to transact pecuniary business. In the case of the introduction of any ordinary bill, amending the law, into the House of Commons, the first stage is, to obtain leave from the house to "bring it in." In the House of Lords, a member may move a bill without previously obtaining leave. On a bill being brought in, the next step is the first reading. A member moves that it be read a first time. If there be a party in the house bitterly opposed to the principle of the measure, it may be opposed in this stage, and a debate and division will of course ensue. If the objections be merely to the details, they are reserved for a future opportunity. On its passing this ordeal, the bill is ordered to be printed. The next ordeal is the second reading, after which the bill is referred to a committee of the whole house, to be examined. In this committee, as in a committee of supply, the body is the same in every respect as that which constitutes the House of Commons, but the members are considered as having assembled, not to debate general questions, but to enter on a business-like examination of the various clauses of the measure. When the committee have examined all the clauses, the next formality is, that they report to the house, and that their report be received. It is then moved that the bill be read a third time. This stage is, in disputed measures, generally the last trial of party strength. If the third reading is carried, there is still another motion, to the effect "that the bill do pass," and this motion is seldom opposed. On the bill passing one house, it is conveyed to the other, where it has to pass through the same succession of readings. When amendments are made on a bill after it has passed through one of the houses, in that to which it is then sent, it must be re-transmitted to the house where it first passed. That house may accede to the amendments, and so let the bill pass; or it may reject the whole measure in consequence of them; or it may, adhering to its first opinions, hold a conference with the other house, with a view to a settlement of differences. When a bill has passed both houses, its next step is the royal assent, which may be given either by the sovereign personally, or by commission.

A bill that has received the royal assent becomes a law, the operation of which commences from the moment when the consent is adhibited, unless another point of time be stated in the act. All the statutes of a session are ranked in order, according to the date at which they have received the royal assent; and the whole set are distinguished from others by the year of the reign in which they have been passed. Technically, the whole legislation of the session is called one act, and each statute, or act, according to the common acceptation of the term, is called a chapter of it. The privilege of printing the statutes in their original state, without note or comment, is reserved to the king's or queen's printers. In the printed edition of the statutes, each chapter is divided into sections. This arrangement has been adopted by the printers for convenience of reference, but in the original copy of the act there is no such division—the whole is a continuous manuscript without break. Nor is the division into chapters even authoritative. The consequence is, that when a new act is passed, making alteration on some part of a previous one, instead of specifying the chapter and section that is altered, it describes the act vaguely, as an act passed in such a session, for such a purpose. Thus, in 1839, an act was passed to alter a section of the Patents Act, passed in 1837. For any ordinary purpose, this would have been called an act to amend the seventh section of the act 5 and 6 William IV. chapter 83; this would have led to the exact point at once: but as there are no such things as chapters and sections known in law, the legislature could only give a roundabout description, thus—"An act to amend an act of the fifth and sixth years of the reign of his late Majesty William IV., intituled an act to amend the law touching letters-patent for inventions." Sometimes, there is a series of acts, the latter ones amending those that have preceded them, so that the titles are involved in almost inextricable confusion. Even where the acts are divided into sections, as they are by the printers, it is found very difficult for lawyers to unravel their meaning, and to unprofessional people they are often a sealed book. A section generally consists of but one sentence, and as it has often to give a long narrative of things that must be done, independently of circumstances, and others that must be done in particular cases, and others that may be done but are not imperative, and others that must not be done, &c., the comprehension of the full meaning of the sentence requires a strong mental effort. Among the statutes, there are individual sentences which, if printed in the form of an ordinary novel, would fill a hundred pages.

There are some acts which are passed every session in the same terms, such as the Mutiny Act, the indemnity for neglecting to take the oaths, &c. Independently of these, the statutes now passed in a single year generally fill a quarto volume of about 500 pages, very closely printed. Besides these acts, which generally either apply to the whole empire, or to some one of the great national divisions of it, there are annually passed several folio volumes of statutes, called "Public Local Acts," consisting of the police acts of the various towns, and acts for the construction and management of harbours turnpike roads, bridges, gas-works, water-works, railways, &c. It is by virtue of legislative authority only that monopolies can be constituted in such cases, and that individuals can be compelled to sell their property for the use of public works. Hence, this is a separate branch of the statute law, comprising several hundred volumes.

The necessity of consolidating together the various statutes on different subjects, has from time to time been felt and expressed by the first legal statesmen of Britain. Lord Bacon, in whose days the statute law did not occupy a twentieth part of its present bulk, spoke with alarm of its overgrown size, and recommended that the whole ought to be abridged before it should become unmanageable. Already something has been done. The revenue acts, which occupy a large portion of the statute-book, were partially consolidated in 1826. About 400 acts relating to the customs, and similar matters, the prevention of smuggling, registration of vessels, &c., were repealed, and the new regulations on the various heads were consolidated in eight acts. To these acts, each subsequent session has generally made some addition; but to prevent confusion from this source, a very simple remedy has been devised. When there have been several additions made to an act, a new one is framed, embodying the whole contents of the old act, as altered by the subsequent ones, and then all previous legislation on

the subject is repealed. Thus, in 1833, all the custom-house acts were a second time consolidated; that is to say, the acts of 1826, with the additions and alterations made to them by later acts, were imbodied together in a set of new acts, so that no one, in consulting the custom-house laws, can have to go farther back than 1833. Measures are no doubt in preparation to extend this principle to other departments. At this moment, there are upwards of 120 stamp-acts in operation, one of them as old as the reign of William III. The existence of these confused masses of legislation effectually prevents people from being able to act up to the laws, however willing they may be, and their protection is frequently in other people being equally ignorant of the laws that are broken. Invidious investigations into antiquated laws are thus occasionally the means of subjecting individuals to great hardships, by bringing punishment upon them which no foresight could have averted. Hence the trade of what are called common informers, whose vindication of the law has too often the effect of merely heaping calamities on individuals, instead of producing a uniform observance of the laws. The pursuit is a very unpopular one; but when laws are in every respect just and good, it is difficult to see how the enforcement of them can be other than an advantage; and it would appear to an unprejudiced stranger to be a somewhat contradictory practice, first to make laws, and then teach society to hate and punish those who put them in force. As society advances in intelligence, the necessity for the reform of the whole system of law, and its simplification into one comprehensive code, will become more apparent, while the mode of administering the law in courts will also be seen to require revision. Every thing at present indicates that we are approaching the point when these important steps must be taken.

English Courts.—We have now to notice the various courts of law in England. The House of Lords must be mentioned as a general court of appeal from the whole kingdom. There is only one set of superior judicatures from which a reference may not come before it in some form or other—the criminal courts of Scotland. The origin of parliament is connected with the great council of the feudal kings, which gave them advice both in legislative and judicial matters. When parliament was separated into two houses, the judicial business adhered in general to the upper, and, probably at the instigation of the bishops, the Lords adopted the power of administering oaths, which was not possessed by the Commons—a circumstance which more distinctly marked their judicial character. To bring causes which have passed through the hands of learned judges under the direct cognisance of a body consisting of clergymen, soldiers, and young men of fashion, would be too preposterous to be practically adopted; and though the appeal is nominally taken to the House of Lords, it is heard and decided on by one of the eminent lawyers, of whom there are always several in the house, and generally by the Lord Chancellor. Independently of their powers as judges of appeal, the Peers act as a criminal court in all cases where a peer of the realm is tried for a capital crime. They are formed into a temporary tribunal for the occasion, presided over by a judge called the lord high steward. This official is properly the judge, the peers acting as a jury, and giving their verdict on the question of guilt. The directly feudal origin of this relic of ancient practice will be at once recognised.

The principal courts of first resort are naturally divided into courts of common law and courts of equity. The former are three in number; the King's or Queen's Bench, the Common Pleas, and the Exchequer. Each has a chief, and four assistant judges, called puisne or junior judges. These courts date their origin to the Conquest. On feudal principles, the Norman kings called all the principal causes which had, under the Saxons, proceeded before the county courts, to be decided in their own hall, or court, by their own great council, which was presided over by an officer called the justiciar. This court, called the *Aula Regis*, or King's Court, at first followed the king's person, a great inconvenience, removed by Magna Charta, which fixed it permanently in Westminster. Under Edward I., the system was adopted of sending deputations from the court twice a year, to try cases in various parts of the country. Under the same monarch, the jurisdiction of the court was split into three parts. To the justiciar, afterwards called chief-justice, were assigned the pleas of the crown, as they were termed, involving all offences; and being the highest judicial officer in point of rank, his court was appointed to have cognisance over the two others. The matters connected with the exchequer, viz., the regulation of the royal domains, the collection of duties and other taxes, were committed to judges called barons, presided over by a chief-baron. All questions about the possession of land, and other litigations between one citizen and another regarding matters of property, were called "common pleas," and were committed to certain justices, presided over by a chief justice.

The King's or Queen's Bench is thus the chief criminal court, and the Exchequer is the principal tribunal for revenue matters; but these courts are by no means restricted to the departments to which they are so assigned—they possess, concurrently with the common pleas, a jurisdiction in all ordinary questions of common law. The manner in which they obtained this power is one of the most extraordinary circumstances in the history of the laws of any country. The instruments made use of were, as has been hinted, the fictions, described as a peculiarity of the English law. To get at the real motives which were at work, it is necessary to recollect, that formerly not only the judges, but all the officials connected with the several courts, were paid by fees, the amount of which depended on the extent of business transacted. They were thus like so many tradesmen keeping shops for the sale of justice, each anxious to keep a large supply of whatever was most wanted, and to serve the public on the most tempting terms. In this manner, the courts of law undersold the courts of equity by not demanding any sanction, such as an oath, for the truth of what litigants declared in their pleadings. An arduous run for business was carried on between the three common law courts, the accounts of which, as given in the legal histories and law-books, are infinitely grotesque. The extent to which a court could carry its jurisdiction by these means, depended less upon reason than upon the muscular power of those officers of the court who enforced its decrees. The Exchequer, when it attempted to levy taxes, was told occasionally that the person charged with them could not pay, by reason that his debtors had not paid what they owed him; while he hinted, that if the Exchequer wished his money, they had better assist him in recovering it. On this, it became the practice of the Exchequer to assist those who were in debt to the crown to get payment of the money due to them. It occurred to some ingenious lawyers, employed to recover debts, that if they stated to the Court of Exchequer that certain clients were debtors of the crown, and could not pay by reason of their own debtors not satisfying their demands, the court would make very little inquiry into the truth of the statement, but would adjudicate in the case, and levy the money forthwith. The court made so little inquiry as to the truth of the case, that it would not allow the statement to be contradicted, however inaccurate it might be; and down to the year 1832, when one brought an action in the Court of Exchequer, it was a matter of form that he should say he was a debtor to the king, and that he could not pay his debt, unless an obligation, incurred in his favour by the defendant, were fulfilled. The jurisdiction of the

King's Bench was limited to cases that were either purely criminal, or had some connection with offences. When any one, however, happened to be in the prison of the King's Bench for an offence, there was no means of getting at him but through that court; and so the plan was devised, of stating that a man was in the King's Bench prison when he was not. "And in process of time," says Blackstone, "it [the Court of King's Bench] began, by a fiction, to hold plea of all personal actions whatsoever, and has continued to do so for ages; it being surmised, that the defendant is arrested for a supposed trespass, which he never has, in reality, committed; and, being thus in custody of the marshal of the court, the plaintiff is at liberty to proceed against him for any other personal injury, which surmise of being in the marshal's custody the defendant is not at liberty to dispute." These fictions were not abolished until the year 1832, when, by act of parliament, a uniform process was established in the three common law courts. An appeal lies from the decision of any one of these courts to the judges of the other two, who, when met to decide on such appeals, constitute a court called the Exchequer Chamber. Fourteen of the fifteen judges who form these common law courts hold the assizes in the various county towns —in some of them twice, and in others thrice a year. Here they act both as civil and criminal judges. Offences committed in London and its vicinity are tried by a tribunal lately created, called the Central Criminal Court.

The origin of the authority of equity tribunals has been already considered. The principal establishment of this description in England is that of the Chancery. It has in it three distinct courts, and three judges—the chancellor, the vice-chancellor, and the master of the rolls. Formerly, all proceedings in bankruptcy centered with the lord chancellor, but the increasing importance of this class of business rendered it necessary to appropriate a separate court to the purpose. This was accomplished in 1832 by Lord Brougham's act. The term Bankruptcy is in England confined entirely to persons engaged in commerce; and the jurisdiction of the court is so limited. Previous to its formation, however, it had been found expedient to create a court for the relief of insolvent debtors who might not be engaged in trade, on their giving up their property to their creditors. By Sir John Campbell's act for restricting imprisonment for debt, the practice of relieving insolvent debtors was improved, nearly on the model of the Scottish system of *cessio*, and a bankruptcy code was applied to debtors who might not be tradesmen. The utility and importance of the Insolvent Debtors' Court were thus materially enlarged. Another court was lately brought into existence, called the Judicial Committee of the Privy-Council. It consists almost entirely of the judges of the other courts. Its principal jurisdiction is in appeals from the colonial courts, and the Court of Admiralty. This Court of Admiralty has jurisdiction in maritime contracts, and crimes committed on the high seas. Having to deal with matters in which the inhabitants of this and of other countries are jointly interested, it professes to follow, not the special law of England, but the general commercial law of modern Europe, founded on the Roman law. In time of war, the court receives a commission to adjudicate regarding prizes taken from enemies, or from neutrals committing breaches of neutrality. Besides all the tribunals already mentioned, there are ecclesiastical courts in the two archiepiscopal provinces of Canterbury and York. In the former, there are the Court of Arches, the Prerogative or Testamentary Court, and the Court of Peculiars; in the latter, the Prerogative Court and the Chancery Court. There are also many inferior ecclesiastical courts. The chief jurisdiction exercised by these tribunals, besides questions of ecclesiastical discipline, is in matters relating to succession to movable goods. If we were to complete the list of English tribunals, it would be necessary to include the justices of peace, who, besides many special powers in revenue and other matters conferred by act of parliament, sit, at the general and quarter-sessions, as judges in minor offences. Then there are various courts, of greater or less jurisdiction, connected with cities and boroughs; and, in some places, establishments called courts of requests, for adjudicating in cases of petty debts.

After having detailed the legal system of England, it is unnecessary to describe that of Ireland, which is almost in all respects a model of it. The bankruptcy system of England was lately ingrafted on that part of the empire, and the principles of the improved Insolvent Debtors' Act were extended to it in August, 1840. The chief distinction in the nature of the courts of law, consists in this, that in Ireland a considerable amount of the judicial business is transacted at courts of general session, held quarterly by the justices of the peace, who act under the advice of professional lawyers, called assistant barristers.

LAW OF SCOTLAND.

From what has been already said, it will be gathered that the law of Scotland was chiefly composed of the feudal system and the Roman law. The former was in practice according to the form in which it had adapted itself to the particular customs of the country, the latter was taken from the doctrines of the civilians. The origin and progress of feudalism in Scotland are very obscure. The chroniclers attribute the foundation of the system to Malcolm II., in the eleventh century, but with little probability. It is more likely that, with the resort of foreigners, Saxon and Norman, to the court of the Scottish king, subsequently to the conquest of England, the system was imperceptibly and gradually introduced. The monarchs, who were ambitious of presiding over a distinguished court, gave particular encouragement to the Normans, to whom they granted large fiefs or lordships; and it was natural that they should return the same homage to which they were accustomed in the country of their origin. The whole of the Lowlands, indeed, and a great part of the Highlands, became nearly as thickly adorned with Norman aristocratic names as the broad plains of England; and it was this alien aristocracy that submitted with so much indifference to the claims and encroachments of Edward I. There appear to have been many points on which the earlier laws of the two divisions of the island were identical. In England, however, as we have already seen, the feudal system received many checks, while in Scotland it was allowed to grow rank; and the deference paid to the civil law in the north served to widen the distinction. The alliance and continued intercourse with France, moreover, naturally drew the legal practice in the direction of the example set by that country.

There is little information to be derived concerning the practice of the law in Scotland, previous to the sixteenth century. Edward I. probably destroyed some vestiges, through which its history might have been traced; but he seems to have been charged by some antiquaries with the destruction of more than ever existed. He did more, probably, by fabrication than by destruction to poison the sources of Scottish jurisprudence. The earliest alleged collection of the laws, commonly called the *Regiam Majestatem*, bears so near a resemblance to the English work of Glanvil, noticed above, that it is naturally supposed to have been a digest, not of what the laws were, but of what the conqueror wished them to be. The earliest Scottish legal writer, whose works are quoted, is Balfour, who prepared, about the latter end of the sixteenth century, a compendium, chiefly derived from the Regiam Majestatem, the acts of parliament, and the decisions of the court. In the reign of James VI.

a commission to make inquiry into the laws, of which the celebrated Sir John Skene—whom Sir James Melville chose as his legal adviser on his embassy to Denmark, because he was "a stout man like a Dutchman" —was a member. They collected and published many acts of parliament, the Regiam Majestatem, and other consuetudinary laws, such as the customs of the royal burghs; and Sir John Skene wrote a curious work on the meaning of technical legal expressions. But the first really scientific writer on the law of Scotland was Sir Thomas Craig, whose book on the feudal law was published in 1655. It is a work of great learning and thought, in which the reader is somewhat surprised to find that, though the work professes to be a Scottish law-book, it should derive so much of its learning from the practice of continental nations. The next great authority is Lord Stair, the equivocal statesman of the reign of James VII., whose Institute, on the model of that of Justinian, is remarkable for the breadth of its legal principles, and the acuteness with which they are practically applied. Soon after the middle of the eighteenth century, a second Institute was prepared by Mr. Erskine, professor of Scottish law, more suited to the knowledge of the age than that of Stair, but more dry and formal. Sir Walter Scott has justly denominated Erskine's Institute the Scottish "Coke upon Lyttleton." There were formerly few opportunities of acquiring a legal education in Scotland, and it was the practice for the youth studying the Scottish law to repair to one of the continental universities, among which Leyden and Paris were preferred. On the occasion of the appointment to a chair of law in Aberdeen, in the seventeenth century, Spalding the Chronicler says, it was "strange to see ane man admitted to teach the lawes, who was never out of the countrie studieing and learning the lawes;" thus expressing his astonishment that any man could be presumed to become acquainted with a system of law on the spot where it is administered. The civil law is still professedly studied in Scotland, but its ancient influence has sunk beneath the progress of commerce, and the increase of statutory regulations, which compel the lawyer to spend much of his time with acts of parliament and reports of decisions.

Scotland has a considerable quantity of early statute law, but not nearly so much as England. Down to the time of the Revolution, the general principles only of the acts had the assent of the assembled parliament—the details were all prepared by a committee called the Lords of the Articles. The older acts are remarkable for their Spartan brevity—a dozen of them could be put into the title of an act of the reign of George III.; and a modern malt or glass duties' act would occupy half the Scottish statute-book down to the reign of Charles II. It was a practice derived from the civil law, that acts of parliament became repealed by disuse, or contrary practice. Since the union with England, the parliament of the united kingdom has legislated for Scotland, and to the acts so passed the above doctrine does not apply. The description of the passing of an act given above, applies to acts relating to Scotland as well as to those which apply to England. It has been felt as a defect in Scotland, that in many cases acts applicable to the whole kingdom are drawn by English lawyers, who do not apply their provisions to meet the peculiarities of Scottish practice.

The earliest superior tribunals in Scotland were either the parliament, as the king's great council, or a committee of it, acting with the delegated powers of the whole body. There was likewise, as in England, a king's justiciar, whose authority was vast, and not very well defined, especially in criminal matters. Committees of parliament were, in the fifteenth and the beginning of the sixteenth century, sometimes formed into regular courts of justice, in which, however, a certain degree of fluctuation could not be avoided. In 1532, the present Court of Session was constituted, on the model, it is believed, of the parliament of Paris. The chancellor, whose principal duties disappeared at the Union, was chairman of this body. It consisted of fifteen judges, including a president, who was chairman in absence of the chancellor. In 1830, the number of judges was reduced to thirteen; and about the same time, the authority of some other tribunals, the chief of which were the Courts of Admiralty and Exchequer, was transferred to the Court of Session. It consists of two divisions which are separate tribunals. Some of the judges also act as individual judges in courts of their own, in which capacity they are termed "lords ordinary." An ordinary case, on coming into court, is discussed before a lord ordinary, from whose decision there is a reference to one of the divisions of the "Inner House," as it is termed, where the remaining judges sit collectively. From them there is an appeal to the House of Lords. There is no such conventional distinctions as that between law and equity known in Scotland, and hence English lawyers, who are apt to measure all other systems by their own, absurdly enough speak of the Court of Session as a court "both of law and equity." Besides the usual adjudication of litigated cases, there are two very useful descriptions of action peculiar to this court. The one is called an action of "declarator," which a person who is puzzled about any difficulty, and is afraid of committing an illegal act, may bring, to have the law as to the point declared, and his course of action made plain; another is called a "multiplepoinding," which may be raised by a man having money in his hands which more than one person is claiming, that he may know to whom he can legally pay it. Trial by jury was not, until very lately, added to the jurisdiction of this court. It is limited to certain descriptions of cases, and is far from popular.

The principal criminal court is the Court of Justiciary, consisting of seven of the judges of the Court of Session, who sit in Edinburgh, and commission some of their number to hold circuits in the country. Almost all offences in Scotland are prosecuted by a public prosecutor; there is no grand jury, and the ordinary jury, consisting of fifteen, give their verdict by a majority. The criminal law is partly statute, partly founded on long usage. There are many offences which, by this latter portion of the law, are punishable with death, if the prosecutor do not restrict the extent of punishment to be awarded, which he now does in almost every case except murder. The sheriffs, or local judges of counties, have important judicial powers, both civil and criminal. The former extends to every description of dispute regarding property, except what refers to land. The powers of these judges have lately received extensive additions, especially in matters of insolvency and bankruptcy. They do not employ a jury except in criminal cases, in which their power of inflicting punishment does not exceed imprisonment. They hold small debt courts, where questions of debt to the amount of £8, 6s. 8d. are summarily decided. The magistrates of royal burghs enjoy powers somewhat analogous to those of sheriffs. The authority of the justices of peace in Scotland is not so extensive as it is in England.

There has latterly been some indications of the assimilation of the legal usages of Scotland to those of England, and it is highly desirable that an end should speedily be put to all existing diversities.

THE FRENCH CODES.

The ancient laws of France were a mixture of the civil, feudal, and canon law. Partly they were the doctrines of the authorities on the civil law, and partly they were the ordinances issued by the various monarchs. By

far the greatest portion, however, in bulk, consisted of the peculiar feudal customs of the various provinces. In these the feudal system was sometimes retained in so high a state of purity, that the collections of provincial customs are esteemed excellent authorities on the subject. But it was not merely in each province that there was a local custom. The power of the crown, or any other paramount legislature, was so feeble, that wherever an assembly of men were held together by one common tie, as where they were co-vassals of one lord, or members of the same civic community, they had in some measure a code of laws of their own. The royal codes, which existed on a large scale, are estimated at about 300, but of the number of inferior local customs it would be impossible to make an estimate. Voltaire observes, that a man travelling through his country has to change laws as often as he has to change horses, and that the most learned barrister in one village will be a complete ignoramus a few miles off. The seignorial courts were divided into three grades, according to the extent of the penal authority exercised by them. The principal courts of law were the parliaments of the respective provinces. Seats in them were generally held by purchase, or were in the hereditary succession of great families, who thus constituted a species of professional nobility. The decrees of these bodies were often baffled or reversed by the royal authority, exercised in the well-known form of *lettres de cachet*. These alterations of the decisions of the courts, however, were performed not as a judicial revision, but by the simple authority of the king; and thus the parliaments being subject to no judicial control or responsibility, adhered but slightly to fixed rules of law, and often acted according to their own will and discretion. The jury, even so much of it as may have existed under the old feudal form, had entirely disappeared, and proceedings were conducted in secret. Criminal investigations, instead of terminating in a conclusive trial, as in England, were protracted through a liagering succession of written pleadings and secret investigations, from which the accused could never calculate on being free. The torture was extensively employed; but in the general case, only where there was as much circumstantial evidence as would justify a conviction in this country.

The whole of this system was swept suddenly away before the tide of the Revolution, but amid the troubled times that succeeded, it was long ere rulers could find peace and leisure for the erection of a substitute. In 1800, Napoleon appointed a commission to draw up a project of a civil code. The project when prepared was circulated for comment and suggestion, and was afterwards, along with the observations made on it by the different courts of law, discussed in the council of state and the tribunate. Thus was formed the *Code Civil*, or civil code of France, more generally known by the term *Code Napoleon*, which was applied to it under the empire. Nearly at the same time, and in the same manner, was framed the *Code de Procedure Civile*, or code for regulating the form of process in civil actions, and specifying the jurisdictions of the various courts. Being a subject more connected with technical detail, and involving less of general principle than the civil code, its provisions were left almost entirely to the arrangement of the lawyers. Besides the technical directions in which lawyers are almost wholly interested, there are in this manual many which concern the ordinary proceedings of citizens at large, such as directions for the order to be taken regarding the effects of a deceased person, &c. This code is generally accompanied by a table of fees in law proceedings. In 1807, another code was promulgated called the *Code de Commerce*, consisting of 648 sections. This is the commercial code of France, regulating partnership, bills and notes, banking, shipping, bankruptcy, &c. By this code provision is made for merchants choosing boards or courts from among their own number, called *Tribunaux de Commerce*. The jurisdiction of these courts, which are very numerous, extends to questions between merchants, and disputes arising out of commercial transactions. In criminal legislation, a different order was pursued from that adopted in the civil; the procedure code was prepared and adopted before the crimes to which it was to apply, and the punishments it was to enforce, were defined. The *Code d'Instruction Criminelle* was promulgated in 1808, and the *Code Pénal* in 1810.

Such were the laws issued under the government of Napoleon, commonly called *Les Cinq Codes*, or the Five Codes. There are other collections of regulations, which should be added to make up a complete body of French laws—a military code, issued by Napoleon; regulations concerning woods and forests, issued under Charles X.; various laws as to the press and theatrical exhibitions, and alterations of the penal code, issued under the government of Louis Philippe, &c. It is simply in the Five Codes, however, passed under Napoleon and confirmed at the restoration, that the modern laws of France are known to Europe at large. They are generally published in a small, thick, closely-printed volume; and for the conciseness, clearness, and elegance of their language, and their intrinsic merits, they are a favourite subject of study with many British lawyers, while there are few places in civilized Europe in which they are not generally known. Independently of the division into books and sections, the paragraphs in each code are numbered straight on from the commencement, an arrangement which gives peculiar facilities for reference. Thus there are in the civil code 2281 consecutively numbered paragraphs. In a country where the material of the law is so gigantic as it is in England, it is of the highest interest to mark the practical working of this grand effort at simplification. To an unlearned person in this country, it is a much easier thing to know the law of France on any particular point, than the law he is living under. If an English lawyer is asked a question, his answer involves reference to commentaries, decisions, and statutes innumerable; but in the general case, the answer of a French lawyer bears simple reference to such a paragraph of such a code.

The French codes adopt the phraseology of the Roman law and many of its principles. The most striking deviation from the previous law of France, and the present systems of other countries, is perhaps in the rules respecting succession. The children succeed to equal shares of the parents' property, whether it consist of land or movables; and if there be no legitimate children, illegitimate children may succeed. The parent is limited in the disposal of his property by will. He can only bequeath the half if he have one legitimate child, and the third if he have two. Restrictions somewhat similar are to be found in other countries with respect to movable property, but not as to land. The effect which the extensive partition, naturally occasioned by this law, has effected, and may effect in France, is a subject of great interest to political economists. In the mercantile law there are several provisions unknown to this country, such as registers for hypothecs or securities held over moovable goods or merchandize, and societies "en commandite," or partnerships in which certain managing members are responsible for the obligations of the company to the extent of their whole property, while the sleeping partners who advance money are not responsible beyond the amount of their shares. The chief improvement in the criminal law effected during the Revolution, and sanctioned by the code of instruction, was jury trial, to which Napoleon was much opposed; the system, as finally settled, bore more resemblance to the Scottish than to the English form, prosecutions being

conducted by public prosecutors, there being no grand jury, and the jury of final trial deciding by a majority. In other respects, the criminal law is more remarkable for its austerity than for its subserviency to the general good of the public. With Napoleon, though that object was not neglected, it was made secondary to the consolidation of his own power; and offences are measured less by their pernicious effects on society at large, than by the trouble or danger they might occasion to rulers. Hence was adopted in many cases the stern and simple method of putting arbitrary power over criminals into the hands of the administrators of the law, while punishments of the highest kind were reserved for offences against the authorities.

POPULATION—POOR LAWS—LIFE-ASSURANCE.

POPULATION.

The rate at which human beings naturally increase, the proportion which this increase bears to the means which exist for their subsistence, and the laws which operate to bring the increase and the means of subsistence into conformity, were subjects scarcely reflected on by our ancestors, but have been matter of keen controversy during the first thirty years of the present century.

As far as population was at all thought of in former times, the prevalent doctrine was, that the greater the numbers of a nation, the stronger was the state, and the more likely was that country to be a scene of both agricultural and commercial industry. So useful were numbers considered for increasing the means of subsistence, and also of national defence, that in many countries it was thought proper to make laws for encouraging matrimony, and to put bounties on all families exceeding a certain number. So lately as the time of Louis XIV., pensions were given in France to individuals who had ten or more children.

Dr. Adam Smith, in his *Wealth of Nations*, was perhaps the first to suggest any thing like a law as regulating the increase of population. He remarked, that "the demand for *men*, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast. It is this demand," says he, "which regulates and determines the state of population in all the different countries of the world—in North America, in Europe, and in China; which renders it rapidly progressive in the first, slow and gradual in the second, and altogether stationary in the last."

VIEWS OF MR. MALTHUS.

This hint, for it is little else, is said to have been what suggested the celebrated essay of Mr. Malthus, which first appeared in 1798, but was almost reconstructed in a second edition of 1803. There was something so startling in the views of this writer, and at the same time so much plausibility in his arguments, distressing as they were to natural feelings, that his work attracted great attention, and many of the ablest thinkers and writers of the day became converts to its main doctrines.

An abridgment of Mr. Malthus's views, given in the *Edinburgh Review* for August 1810, sets out by showing that "the rate of population is by no means the same in all parts of the world." The variations in the rate are universally preceded and accompanied by variations in the means of maintaining labourers. "Where these funds are rapidly increasing, as in North America, the demand for an increasing number of labourers makes it easy to provide an ample subsistence for each; and the population of the country is observed to make rapid advances. When these funds increase only at a moderate rate, as in most of the countries of Europe, then the demand for labourers is moderate: the command of the labourer over the means of subsistence is consequently much diminished; and the population is observed to proceed at a moderate pace, varying in each country, as nearly as may be, according to the variations in the funds for its support. Where these funds are stationary, as we are taught to believe is the case in China, and as has certainly been the case in Spain, Italy, and probably most of the countries of Europe during certain periods of their history, there the demand for labour being stationary, the command of the labourer over the means of subsistence is comparatively very scanty, and population is observed to make no perceptible progress, and sometimes to be even diminished.

"In the second place, it is a fact equally notorious, that the actual increase of the funds for the maintenance of labour does not depend simply upon the physical capacity of any particular country to produce food and other necessaries, but upon the degree of industry, intelligence, and activity, with which these powers are at any particular time called forth. We observe countries possessing every requisite for producing the necessaries and conveniences of life in abundance, sunk in a state of ignorance and indolence, from the vices of their governments, or the unfortunate constitution of their society, and slumbering on for ages with scarcely any increase in the means of subsistence, till some fortunate event introduces a better order of things; and then the industry of the nation being roused and allowed to exert itself with more freedom, more ample funds for the maintenance of labour are immediately provided, and population is observed to make a sudden start forwards, at a rate quite different from that at which it had before proceeded.

"This seems to have been the case with many of the countries of Europe during some periods of their history; but is more particularly remarkable in Russia, the population of which, though very early inhabited, was so extremely low before the beginning of the last century, and has proceeded with such rapid steps since, particularly since the reign of Catharine II.

"It is also a fact, that has often attracted observation in a review of the history of different nations, that the waste of people occasioned by the great plagues, famines, and other devastations to which the human race has been occasionally subject, has been repaired in a much shorter time than it would have been, if the population after these devastations had only proceeded at the same rate as before. From which it is apparent, that after the void thus occasioned, it must have increased much faster than usual; and the greater abundance of the funds for the maintenance of labour, which would be left to the survivors under such circumstances, indicates again the usual conjunction of a rapid increase of population with a rapid increase of the funds for its maintenance. Just

after the great pestilence in the time of Edward III., a day's labour would purchase a bushel of wheat; while, immediately before, it would hardly have purchased a peck.

"With regard to the minor variations in the different countries of Europe, it is an old and familiar observation, that, wherever any new channels of industry and new sources of wealth are opened, so as to provide the means of supporting an additional number of labourers there, almost immediately, a stimulus is given to the population; and it proceeds for a time with a vigour and celerity proportionate to the greatness and duration of the funds on which alone it can subsist."

From these and other premises, Mr. Malthus laid it down as a proved fact, that population tends to increase at the rate of a doubling every twenty-five years. He, at the same time, endeavoured to show that, as man begins to use the best lands first, and then has to go to worse and worse, it becomes always more and more difficult to obtain the means of subsistence for increasing numbers. He concluded that, at the utmost, the means of subsistence would be found, at the end of each successive quarter of a century, to have increased only at the rate of double for the first, triple for the second, quadruple for the third, and so on. Thus, (said he,) while population would go on increasing in a geometrical ratio, that is, as 1, 2, 4, 8, 16, 32, 64, 128, &c., food would increase only in an arithmetical ratio, that is, as 1, 2, 3, 4, 5, 6, 7, 8, &c.; and the consequence of an unchecked increase of the one, with the utmost possible increase of the other, would be that, when the population of the globe had advanced to 500,000 millions, there would only be food for 10,000 millions, or a fiftieth part of the number!

Considering, then, that there is a power and a tendency in human beings to increase so rapidly, and that, in point of fact, it is only in a few favoured spots that they do increase at such a rate, Mr. Malthus concluded that there must be some counteracting agencies, or *checks*, in constant operation, in almost all communities, to restrain population at a lower rate of increase, or to keep it stationary. In looking about to discover these checks, he satisfied himself that they were of two orders: first, there was the mortality produced by the effects of deficient food and of wicked passions; these he called *positive checks*: then there was the check produced by a prudent forethought in human beings, leading them to avoid marriage, on account of the little prospect they have of being able to rear a family in comfort; this he called the *preventive check*.

Arriving at this point, Mr. Malthus and his followers proceeded to show how their doctrines were applicable for the benefit of communities. It was held that there could be no choice between the two kinds of checks; it was clearly preferable that population should be restrained by the preventive check.

"It is observed," says the *Edinburgh Review*, "in most countries, that in years of scarcity and dearness, the marriages are fewer than usual; and if, under all the great variations to which the increase of the means of subsistence is necessarily exposed from a variety of causes—from a plenty or scarcity of land, from a good or bad government, from the general prevalence of intelligence and industry or of ignorance and indolence, from the opening of new channels of commerce or the closing of old ones, &c. &c.—the population were proportioned to the actual means of subsistence, more by the prudence of the labouring classes in delaying marriage than by the misery which produces premature mortality among their children, it can hardly be doubted that the happiness of the mass of mankind would be decidedly improved.

"It is further certain, that, under a given increase of the funds for the maintenance of labour, it is physically impossible to give to each labourer a larger share of these funds, or materially to improve his condition, without some increase of the preventive check; and, consequently that all efforts to improve the condition of the poor, that have no tendency to produce a more favourable proportion between the means of subsistence and the population which is to consume them, can only be partial or temporary, and must ultimately defeat their own object.

"It follows, therefore, as a natural and necessary conclusion, that in order to improve the condition of the lower classes of society, to make them suffer less under any diminution of the funds for the maintenance of labour, and enjoy more under any actual state of these funds, it should be the great business to discourage helpless and improvident habits, and to raise them as much as possible to the condition of beings who 'look before and after.' The causes which principally tend to foster helpless, indolent, and improvident habits among the lower classes of society, seem to be despotism and ignorance, and every plan of conduct towards them which increases their dependence and weakens the motives to personal exertion. The causes, again, which principally tend to promote habits of industry and prudence, seem to be good government and good education, and every circumstance which tends to increase their independence and respectability. Wherever the registers of a county, under no particular disadvantages of situation, indicate a great mortality, and the general prevalence of the check arising from disease and death over the check arising from prudential habits, there we almost invariably find the people debased by oppression and sunk in ignorance and indolence. Wherever, on the contrary, in a country without peculiar advantages of situation, or peculiar capability of increase, the registers indicate a small mortality, and the prevalence of the check from prudential habits above that from premature mortality, there we as constantly find security of property established, and some degree of intelligence and knowledge, with a taste for cleanliness and comforts, pretty generally diffused.

"Nor does experience seem to justify the fears of those who think, that one vice at least will increase in proportion to the increase of the preventive check to population. Norway, Switzerland, England, and Scotland, which are most distinguished for the smallness of their mortality, and the operation of the prudential restraint on marriage, may be compared to advantage with other countries, not only with regard to the general moral worth and respectability of their inhabitants, but with regard to the virtues which relate to the intercourse of the sexes. We cannot, as Mr. Malthus observes, estimate with tolerable accuracy the degree in which chastity in the single state prevails. Our general conclusions must be founded on general results; and these are clearly in our favour.

"We appear, therefore, to be all along borne out by experience and observation, both in our premises and conclusions. From what we see and know, indeed, we cannot rationally expect that the passions of man will ever be so completely subjected to his reason as to enable him to avoid all the moral and physical evils which depend upon his own conduct. But this is merely saying, that perfect virtue is not to be expected on earth; an assertion by no means new, or peculiarly applicable to the present discussion. The differences observable in different nations, in the pressure of the evils resulting from the tendency of the human race to increase faster than the means of subsistence, entitle us fairly to conclude, that those which are in the best state are still susceptible of considerable improvement, and that the worst may at least be made equal to the best. This is surely sufficient both to animate and to direct our exertions in the cause of human happiness; and the direction which our efforts will receive, from thus turning our attention to the laws that relate to the increase and decrease of mankind, and seeing their effects exemplified in the state of the different nations around us, will not be into any new and use

pious path, but into the plain beaten track of morality. It will be our duty to exert ourselves to procure the establishment of just and equal laws, which protect and give respectability to the lowest subject, and secure to each member of the community the fruits of his industry; to extend the benefits of education as widely as possible, that, to the long list of errors from passion, may not be added the still longer list of errors from ignorance; and, in general, to discourage indolence, improvidence, and a blind indulgence of appetite without regard to consequences; and to encourage industry, prudence, and the subjection of the passions to the dictates of reason. The only change, if change it can be called, which the study of the laws of population can make in our duties, is, that it will lead us to apply, more steadily than we have hitherto done, the great rules of morality to the case of marriage, and the direction of our charity; but the rules themselves, and the foundations on which they rest, of course remain exactly where they were before."

This must be considered as the mildest possible exposition of the application of Mr. Malthus's doctrines: his theory almost necessarily led to some other practical inferences, of a kind to which it is not so easy for a humane mind to assent. It came to be held, for instance, that, where the preventive check had not operated, it was quite legitimate to allow the positive to come into operation. A human being, who had come into existence undemanded by the state of the funds for subsistence, was to be told that the places at Nature's table were all occupied, and there was no cover for him. To the man who married when there was a redundancy of population, "all parish assistance," said Mr. Malthus, "should be most rigidly denied; and if the hand of private charity be stretched forth in his relief, the interests of humanity imperiously require that it should be administered very sparingly." These notions were adopted very generally by a class of political economists, and for twenty years they were in vogue in England, where the notorious abuses of the old poor-law had prepared the minds of many for taking extreme views with regard to public charity. But it was impossible for the great bulk of the community to give a cordial reception to doctrines so violently in opposition to the dictates of the natural feelings.

OBJECTIONS TO MR. MALTHUS'S VIEWS.

A reaction at length took place against the Malthusian theory, and opposite views were presented by various writers, the most distinguished of whom was Mr. M. T. Sadler, whose work, entitled *The Law of Population*, appeared in 1830.

By these writers it was represented, that, in America and the Australian colonies, there was an evident tendency in subsistence to increase in a more rapid ratio than population, insomuch that flocks and herds became a drug, and it was not uncommon in Brazil to use fat carcasses of mutton as fuel in lime-kilns. The only difficulty experienced in those regions was in obtaining a market for the vast amount of produce not needed by the native population. Here, it was said, is a clear case in disproof of the proposition that population always tends to increase more rapidly than food.

As for the geometric ratio of the human increase, by which so great an alarm had been excited, what was it, after all, but a different form of the obvious truth, that the more people there were, there would be the more parents, and consequently the more children? Suppose ten families, existing in 1800, having become twenty in 1825, it might certainly be expected that the addition between the last date and 1850 would be other twenty, not ten merely, seeing that the start was not from ten, as it had been before, but from twenty. Such is but an unavoidable consequence of population swelling by multiplication and not by addition. But if the human family follows this ratio of increase, so do all the orders of organic beings, animal and vegetable; sheep, oxen, and hogs, increase at the geometric ratio as well as mankind, and what is more, they begin to multiply at a much earlier period of life. Poultry, for instance, could probably multiply themselves a million of times, before a couple of the human race could do so once. The vegetable food of man is capable of a still more rapid increase. Wheat generally returns from ten to twenty fold in one year. The produce of a single acre of this grain, increased year after year in the ordinary way, would require only fourteen years to reach an amount which would occupy the whole cultivable surface of the globe. And as it is with wheat, so is it with most of the other plants on which we depend for food, either for ourselves or for the animals which become food to us. So that, instead of there being any such disagreement between the natural possibilities of increase in human beings and subsistence, as Mr. Malthus insisted on, there would appear to be a discrepancy in exactly the contrary way; that is to say, subsistence appears to be capable of a much more rapid increase than human beings.

But—the Malthusians object—when the best soils are all under cultivation, it is necessary to resort to the inferior. These require more labour and afford less return. There is therefore a *decreasing fertility* in the country, while its population is always increasing. To this it is replied by the opposite party, that, while worse and worse soils are in the course of being resorted to, better and better modes of culture are coming into operation, so as to make, perhaps, a third-rate soil capable of producing as much, by a certain amount of labour, as a second-rate soil was a few years before, and so on with the other qualities, each being raised a degree in the scale by every fresh effort of human ingenuity. In point of fact, the best British soils do now bear four times the quantity of grain which they did a few centuries ago, and millions of acres then deemed unfit for tillage now produce as much by the same degree of labour as the best soils did at that time. Perhaps the answer is less satisfactory on this point than on any of the rest.

The Malthusians, however, were said by their opponents to derive the strength of their case from limiting their views to a certain region. Their propositions, it was admitted, might be true with regard to a population shut up in a certain small space, without any connection with what was beyond. But such a population never existed, and therefore the apprehended evils never could take place. From the earliest notices we have of the human family, it appears to have been their custom to spread abroad over the soil, when they found that food could be more easily obtained at a distance from the natal spot than at the natal spot itself. The original command given to man, *to increase, and multiply, and replenish the earth*, is only in accordance with what has always appeared as a tendency of the race. It is probable that, at the present time, not above one-hundredth part of the earth's surface is cultivated, and not one-hundredth part of that cultivated in a scientific or advantageous manner; while, from what has taken place, we may reasonably calculate upon the productiveness of the best cultivated parts being yet greatly increased. With such an almost indefinite field still before us, it seems absurd to be under any anxiety as to the supposed tendency of the human family to a too rapid increase. The superabundance of one district has only to go to some yet unpeopled spot, or to exert ingenuity and industry to raise more food from that which they do occupy, in order to maintain themselves in comfort. There is another means whereby it may chance that a superabundant population can support itself in the native locality, though the productiveness of that locality falls short of the demand for food. If it possess advantages for manufactures, it can exert

its industry in that way, and exchange the products for food raised in other countries, where subsistence exceeds population, and advantages for manufactures do not exist.

The opponents of Mr. Malthus combated his notion of checks on moral and religious grounds; and here, certainly, the natural feelings of mankind greatly favoured their views. It was held as an impeachment of that system of wisdom and benevolence seen throughout all nature, that one of the most powerful tendencies of human beings should be supposed to require being put under an absolute arrestment, upon the penalty of its otherwise leading to misery in the individual and embarrassments in the community. It was held that the preventive check, supposing it to be capable of operating without an increase of immorality, was necessarily attended by an abridgment of human happiness, in as far as it involved a denial and repression of the domestic affections. Its cruelty was also partial, for it bore solely on the poorer classes, to whom celibacy is a greater hardship than to the rich. And even supposing that it could be morally carried into effect, so as to keep down population at a certain level, it was, after all, an uncalled-for interference with divine arrangements, which, from all analogy, as well as from their practical effect, might be supposed as having been designed for good ends. For do we not see that the charge of a family acts in all well-constituted minds as an incentive to industry? and can we doubt that equally will a growing population tend, in ordinary circumstances, to increase the industry of a nation? Contemplated thus, the tendency to increase would appear as a means, in Providence, to stimulate men and nations to the utmost possible exertions for the improvement of the materials placed at their command, so that no faculty of their being might lie waste, and no power of physical nature remain useless. Supposing this to be one of the final causes of the population principle, the preventive check of the Malthusians must, of course, appear as an impious attempt to control one of the Creator's most important designs.

OBSERVATIONS.

Such is an outline of the arguments which have been used on this famous question. It must, we think, be generally evident to new and dispassionate inquirers, that there is some truth in the views of both parties, but that the full and exact truth has not been stated by either. For arriving at this, the means do not perhaps exist in the present imperfect state of statistical science; but in the mean time we may present a few considerations which have occurred to ourselves on this subject.

It appears to us to be only an assumption that there is everywhere a tendency to double the population every twenty-five years. We certainly see that such is the case in North America; but possibly this is considerably owing to temptations which are presented by the state of the country, labour being so expensive in all such regions that a bounty may be said to be put upon the possession of a family. Perhaps the natural tendency is there drawn into something approaching to an unnatural state of activity.

Allowing that the increase is no more than what the natural inclinations of that people dictate, it is by no means clear that all nations possess natural inclinations in the same degree. We know that many features of human character are manifested in very different degrees in different nations; and it is therefore not unreasonable to suppose that there are also national differences in those feelings which lead to the increase of the human family. Individuals, it is well known, are characterized very differently in this respect. There are also obvious differences in families, the peculiarity being apparently hereditary. Why, then, may there not be differences also in nations? Perhaps the light to be derived from the history of families and of individuals, has not yet been taken sufficient advantage of for the illustration of this question. A careful inquiry would probably show a far greater amount of natural causes for the obstruction of population, and these altogether independent of Mr. Malthus's checks, than philosophers are at all prepared for.

The history of many families of historical note incontestably shows, that often, with all external advantages, there is surprisingly little tendency to increase. The extinct peerage and baronetage of England forms, it will be recollected, a pretty large book. In that high rank, there is greater longevity, and consequently, it may be presumed, better health, than in lower grades; yet the line often fails for lack of heirs. To take a few cases which happen to be familiar to us—When George fifth Duke of Gordon died a few years ago, it was necessary, in order to get an heir for one of his titles destined to heirs-male, to go back to the ancestor who had flourished in the time of the civil war, all the intermediate persons having failed to send down male heirs, though many had had several sons born to them. When the main line of the Keith Mareschal family became extinct in 1778, it was necessary to go back for a male representative to a collateral line which sprung off from the main one at the end of the fifteenth century, although many goodly representatives and male cadets had flourished in the interval. It is well known that no representative of the royal family of Stuart since Robert III., who died in 1406, has at this time legitimate male descendants. In short, it would appear that families may exist in flourishing circumstances for hundreds of years, and after all, the male progeny may become extinct, and the name of the race be in time looked for in vain. The contrary is, no doubt, often true: for example, the male progeny of the above-mentioned Scottish king exist in great numbers, in all conditions of life. But, while it is the lot of some to be thus multiplied exceedingly, it is not less true that many leave not one copy of themselves, and that even whole clans, numerous at one time, will ultimately shrink, like an exhaled river, and disappear from the land, and all this notwithstanding an apparent sufficiency of what is necessary to comfortable existence. An illustration occurs to us, to which, we believe, many of our readers will readily find parallels within their own knowledge. A citizen of Edinburgh, who died about thirty years ago, had seventeen sons and daughters, most of whom reached maturity. All the members of this second generation have ever since been in comfortable circumstances: some are now dead; the rest have passed on to such periods of life that it is not to be expected that children will hereafter be born to any of them. And what is the number of the third generation of this family? Only *eight*, the offspring of two marriages. Thus showing that the progeny of a single pair may look large at the first remove, but shrink at the second. We may add, that this family appears decidedly marked by much less than the average of a tendency to matrimonial life. As facts are what is here wanted, the writer may be excused for mentioning a circumstance in his own family history. He can trace its course with tolerable clearness for two hundred years, and is pretty well assured that, during the whole of that time, till the generation immediately preceding himself, no representative of the family had more than one son to transmit its name and property. Local antiquaries are familiar with instances of families once numerous in a certain province, but now extinct. The present writer has reason to believe, that his own family existed for more than twice the space of time above mentioned, in one particular place; yet the county in which that place is situated, does not now contain one person of the name.

Were it even admitted that communities are naturally equal in respect of the inclination and power, it still

remains to be shown, that these tend to be equally manifested in all social circumstances. The readiness with which the Malthusians have assumed that this is the case, seems to us highly unphilosophical.

In dense communities, where all social circumstances are in the best condition, there are many enjoyments not known in ruder states of society. It may not merely be that these enjoyments compensate for the want of others, but they may absolutely take away or supplant the inclination for those other enjoyments, so as to make the "checks," as far as they are concerned, a mere empty name. Following out this line of argument, supposing it to be sound, we arrive at the conclusion, that, when a country becomes filled up with people, it is also in general attended with circumstances which moderate the tendency to increase, without that being felt as any hardship.

The noted case of Ireland tends to support this hypothesis. Singularly deficient in the compensatory or rather preclusive conditions, this country has long been remarkable for the rapid increase of its population. The common people, reduced to a degree of poverty which admits of no hope, and exposed to a constant privation of all the ordinary solaces of life, are driven to matrimony as the only comfort in their power, just as others in their condition are driven to the use of intoxicating liquors. The consequences lead to greater poverty, and greater poverty tends to increase the evil; and thus will such a system of things go on until counteracting agencies are brought into operation. Such agencies are now at work in Ireland; wealth and its enjoyments are increasing; and we may therefore hope speedily to see the advance of population in that country less of a wonder than it has been.

Granting the above arguments to be sound, it follows that the stationary condition of the population of old countries is not necessarily to be supposed to be attended with either the hardship of restraint or an extraordinary mortality. If the wealth and ordinary solacements of a people in such circumstances are not in the way of being lessened, they may fairly be presumed to be as well off in all respects as the rapidly increasing multitudes of America.

Where we see the inhabitants of an old country rapidly increasing, we must come to one of two conclusions, either that that country is in a flourishing state, so that there is a kind of bounty put upon children, or that it is in a state of such wretchedness that the intercourse of the sexes is the only attainable enjoyment. With regard to Ireland, we presume there can be no doubt of its liability to pass into the latter category. But the rapid increase of the English people in the last forty years will probably be the subject of a doubt. To determine this question, it might be inquired if the increase of the agricultural products and of the manufacturing industry of the country has been in an equal ratio, and if labouring men, skilled and unskilled, can now obtain for their wages as large a share of the comforts of life as formerly. Notwithstanding popular declamations to the contrary, we suspect this to be the case, and consequently believe the increase of population in England to be, upon the whole, of a healthy description.

POOR-LAWS.

In all stages of society there has existed a class, emphatically termed *the Poor*, composed of persons who, but for the charity of their neighbours, would be nearly or totally destitute, being themselves unable, or all but unable, to supply their own wants. It is easy to see how this has been and must be; for, from accidents in the operation of the natural laws presiding over the birth of individuals, some come into the world without the usual gifts of body and mind required for obtaining a sufficient subsistence; the accidents of life deprive others of the use of their full powers; many reach an infirm old age, without having laid up a store to help them over it; the consequences of vice and error—of all those countless temptations which beset human nature, and from which no one is altogether safe—leave many in a helpless state; finally, in the imperfection of all political institutions, there are circumstances which press severely upon classes and persons, tending to make their own efforts for their subsistence insufficient. The operation of accidents upon one class of parents, and the vices and neglect of others, likewise leave many young and helpless children in a state in which they would be destitute but for the aid of neighbours. All of these causes being inherent in human nature and in society, we may be assured that "the poor we shall have with us always," however it may be possible, by judicious and humane efforts, to keep their numbers within comparatively moderate bounds.

In an early state of society, the relief of the poor is left to the operation of benevolence amongst individuals; and the destitute are either succoured by those locally near them, or go forth to beg relief in a wider circle. Generally, the efficacy of benevolence for this end is made the greater, in consequence of the succour of the poor being set forth as a duty in almost all religions. In addition to occasional and particular acts of charity, donations are made and legacies left, for the purpose of affording a more or less regular and systematic relief within certain bounds. As society, however, advances, it is found that the charity of individuals is either an insufficient means of succouring the poor, or is attended with certain inconveniences. The classes of society becoming more detached from each other, cases of destitution make appeal, almost exclusively, to the parties nearest in poverty; while the rich, and the comparatively rich, are saved from all concern in the matter, merely because local and social circumstances spare them a personal connection with it. A relief by benevolence is found to be oppressive to those who have kind feelings, while the niggardly and ungenerous escape. A dense and highly artificial state of society rendering it impossible to keep watch over particular cases of destitution, the relief afforded is unavoidably partial and unequal—no one knowing the real needs of a petitioner, or how far he is relieved by others; so that a door is opened for the practice of gross imposture, while the more modest poor are probably the least liberally treated. It is also generally found, that this state of society is attended with an increase of the numbers of the poor, rendering individual efforts insufficient, and tending to such disorders that a public provision becomes necessary as a matter of police. A new principle is then evolved from the natural fact of the existence of a poor class, namely, that the community cannot be safe from imposture, spoliation, the propagation of disease, and other evils, unless it combine to assure itself that no person in the country shall want the necessaries of life.

It is then that states begin to make arrangements for the regular relief of the poor; and, generally, these arrangements are of a more or less advanced and efficient nature, in proportion to the advanced social condition of the respective countries. In the most of the Catholic states of Europe, the system adopted consists simply in the ministers of religion taking charge of the voluntary contributions of the people, and administering them to the best of their ability. In Portugal, Sardinia, Venice, France, Belgium, Holland, and some other countries, the same system exists, excepting only that the ministers of religion are superseded in their charge by officers appointed by the state. We need scarcely remark, that the single fact of the funds being voluntary renders it impossible, as to any of these countries, to be certain that

the provision for the poor is sufficient in amount. In England, Ireland, Prussia, Bavaria, Wurtemberg, Mecklenberg, Berne, Russia, Denmark, Sweden, and Norway, the principle is recognised that a compulsory provision ought to be made to ensure that all the members of the community shall have the means of subsistence. In England, this has been in operation for nearly three centuries; but, in the most of the other countries enumerated, it is of comparatively recent adoption. In America, all the states of the Union which are of English origin have, from their commencement as colonies, adopted this principle. In Scotland, laws for a compulsory provision have existed nearly as long as in England, but have never been carried out into full operation. In that country, a voluntary system is followed in more than one-half of the parishes, and a compulsory system in the rest, the clergy being, in almost all instances, the administrators; but nowhere is the principle of a legal right in the poor to relief, or, what is identical therewith, of its being the interest of the community that relief be granted, practically recognised.

ARRANGEMENTS FOR THE POOR IN ENGLAND.

Acts respecting the poor in England only made arrangements as to the places in which they should beg, until, in 1536, immediately after the dissolution of the religious houses, by which the poor had previously been in a great measure supported, it was found necessary to make an effort to repress the enormous prevalence of vagrancy, by enacting that head officers in parishes, towns, and counties, should take charge of the impotent poor and collect alms for their support, and at the same time use force to compel able-bodied mendicants to work for their own livelihood. This and subsequent acts of a similar character appear in a great measure to have failed in their object, chiefly perhaps from the severity of the penalties imposed for disobedience. In 1572, we find the first trace of compulsory assessment for the poor—a measure then resorted to, apparently, because all other means of collecting money had proved insufficient.

It was, however, by the famous act 43 Elizabeth, c. 2, (1601), that the basis of the present system of poor-relief in England was laid. The professed objects of this law were, "to set the poor to work, to relieve the lame, impotent, old, and blind, and to put out their children as apprentices." To attain these objects, the inhabitants of every parish in the county were required to raise a fund sufficient to maintain their own poor; and the administration of this fund was placed in the hands of parish overseers, under the control of justices of the peace. The leading merit of this act was, its requiring that the claims of the able-bodied for relief should be subjected to a *test*, to prove that the alleged want was not the result of an indolent disposition: *such persons were to receive relief only on condition that they should work for it.* To make this rule certain of operation, an act passed eight years after (7 Jac. I. c. 4) ordered the building of *houses of correction*, to be provided with cards, mills, and other implements, and where the vagrant able-bodied poor should be set to work. This may be considered as the origin of the workhouse system in England.

It is clear from the statutes of this period, that the chief evil which the legislature found itself called upon to consider and provide for, was the indolent and vagrant disposition of a large section of the people. It was not, as now, that many men occasionally find a difficulty in getting work, but that many were unwilling to work, preferring to wander about the country in idleness. It appears that these vagrants were accustomed to stay only for a short period in one place, and to flit about to wherever they thought they would be best supported; nor can it be doubted that, in lonely places, they would not be backward to use means for terrifying the lieges into contributions for their benefit. That, in such circumstances, these people would want all moral culture, and be a source of danger to the community, is of course evident. It required many years' operation of the law to reduce this evil; but at length, about the end of the seventeenth century, it seems to have been considerably lessened. The same class of persons then began to prefer the benefits to be obtained through the claim which the law gave them upon their native parishes, and the evil of vagrancy was gradually exchanged for one of another but less grievous kind—an inclination to a timid and slothful dependence on the relief to be obtained at one fixed place. The houses of correction were mainly penal establishments; and it was not till 1723 that workhouses, as now understood, were established. An act passed in that year enabled parishes, either singly or in union, to provide themselves with houses wherein to employ the poor; and enacted that, in case any person refused to be relieved in those houses, he should not be entitled to any other relief. This might be severe upon the real pauper, but it effectually unmasked the voluntary one and the impostor, and proved a protection to parishes against the orders of justices, over-liberal of money not their own. The operation of this law was so favourable to the public, that some began to imagine that paupers might even become profitable; and this was partly the cause of an act (22 Geo. III. c. 83) in 1782, usually called *Gilbert's Act*, which threw upon guardians the duty of finding work for the poor near their own residences, and making up what was required for their subsistence out of the poor-rates. The use of the workhouse as a test of real indigence and inability was thus in a great measure undone, and all its benefits in repressing a pauper population lost. Gilbert's act may be said to have been the foundation of all the evils for which the English poor-laws were latterly so remarkable.

In 1795, the price of wheat, which, at an average of the three preceding years, was 54s., rose to 74s., and the condition of the labouring classes consequently became one of considerable privation and hardship. Instead of temporary measures for getting over a temporary difficulty, one of a permanent nature was adopted. The magistrates of Berkshire in that year issued tables, stating what the wages of a labourer per week ought to be, according to the magnitude of his family and the price of the gallon loaf; directing at the same time the overseers, and others concerned in the management of the poor, to regulate their allowances accordingly. The minimum weekly wages of an unmarried labourer, supposing the gallon loaf to sell at one shilling, were set down at 3s.; when married, and having one child, wages were to be at least 6s.; if he had five children, they were to be at least 12s.; if he had seven children, they were to be 15s. In the event of the price of the gallon loaf rising to 1s. 6d., the wages of an unmarried man were not to be less than 4s. 3d. per week; while the wages of a married man, with a single child, were not to be less than 8s. 3d.; and those of a married man with seven children, not less than 20s. 3d. These regulations, which remind one of the ignorant legislation of the fourteenth century, were made binding, universal, and permanent, by an act passed in the ensuing year (36 Geo. III. c. 23). It cannot fail to be remarked what a mean opinion of the character of the labouring classes of England must have been entertained amongst the more enlightened men of that day, when it was thus thought necessary to undertake for them some of the simplest duties which they owed to themselves, and to make them everywhere pensioners upon the public for a considerable part of their subsistence. As an attempt to secure to a portion of the community the same supply of food in scarce as in plentiful years, and consequently to relieve them from the necessity of those retrenchments by which a deficient supply is distributed over the whole year, and absolute famine averted, the act was further liable to be considered as a

gross absurdity. The evils of the regulations themselves were increased by peculiarities in the administration, by which the labouring classes became a means of enabling one class of rate-payers to carry on a constant warfare against the pockets of another. The general evils of the poor-laws were much aggravated by the arrangements with respect to *settlement*; virtually, the labouring classes were *imprisoned* in the parishes of their nativity, or where some subsequent circumstance, as apprenticeship, marriage, and inheritance, had given them a claim. Thus, the population was distributed not as required by the demand for labour, but as certain accidental circumstances might direct; and, accordingly, there were often hordes of useless labourers at one place, and a great amount of labour without hands to undertake it in another. "Practically, in a pauperized district, where the labourers' wages were composed partly of wages and partly of allowance, the married man had no more free-will as to the parish in which he should reside, the master whom he should serve, or the subsistence which he and his family should receive, than the horse which he drove. In parochial language, he *belonged* to the parish in which he had his legal settlement."* There can be no doubt that the condition of the working classes in England, during the prevalence of this system, was a species of slavery. The system lasted with little alteration for nearly forty years; but long before that time, its moral evils, and the enormous increase of expenditure which it demanded, had excited great alarm, and made England, with regard to this particular part of its domestic polity, a wonder to neighbouring nations. The sum raised for poor-rates in 1776, while the workhouse system of 1723 was still in operation, was only £1,720,316; in the three years after the passing of Gilbert's Act (1783-4-5) it averaged £2,167,749. But the average of 1801-2-3 was £5,348,205; in 1818, a year of scarcity, it reached the enormous sum of £9,320,440; and even in the fair seasons of 1830, 31, 32, and 33, it was above eight millions. This was an increase far exceeding that of the population, and the more alarming as it took place during a period of progressive national prosperity. Almost everywhere it pressed very severely upon the property of the country, and in some places had even caused property to be abandoned, the rates exceeding all that could be derived from the land.

The evil being generally felt and acknowledged, a royal commission was issued in 1832 for inquiring into it, in order that parliament might apply a remedy. The following is a condensed summary of the report which this body drew up, after a careful investigation conducted throughout every part of England and Wales:—"That wherever the expenditure has most increased, there, also, the industry of the labourer had proportionally degenerated, because in such places subsistence from the poor-rates was more easily obtained than by labour. That under such influences the prudence and thrift were discarded, because they could, with the utmost success, only secure for him, by present sacrifice of enjoyment, the same future advantages of which the parish held out a prospect without the necessity of any sacrifice save that of independence. That his sobriety and temperance were thus left without encouragement, and, on the other hand, exposed to the temptations of comparative idleness, and the facilities for the indulgence in idleness and intemperance which always accompany the growth of pauperism: his respectability of demeanour was now useless, as respectability of character ceased to be relied on as a means of securing employment, itself no longer an object of desire. That in the same proportion as he became independent of regular industry, did he also become independent or regardless of the comforts of his home, which are indispensable to the labourer after a day of toil, but are rarely sought or valued as a change after a day spent in idleness or dissipation. It was also observed that, as the habit of pauperism increased, the standard of subsistence of the labourers in the district was lowered, the relief never being sufficient of itself to maintain the pauper independent of all work; and yet, by rendering him partially so, constantly tempting him to forego that further portion of comfort which was attainable only on the comparatively hard terms of earning it by the sweat of his brow. The standard of the paupers' subsistence being once lowered, that of the industrious labourers amongst whom they lived, and who occasionally felt the effects of their competition, fell also. Where the system prevailed of allowing relief in aid of wages, there the operation was immediate, as all the labourers were at once pauperized, being equally exposed to the effects of a system which left all industry, beyond a certain point, without its reward, and therefore without a visible object. While these influences were destroying the industry and morality of the able-bodied labourers, the bastardy-law was holding out encouragement to female unchastity, in the way of a money allowance for each bastard, which, by its amount, of itself elevated her condition in proportion to the number of her spurious offspring, rendering a mother of several bastards better off than she would have been as a mother of as many lawful children, and securing her a dower which usually tempted some man to marry her; while the same law, by subjecting the supposed father to punishment, often subjected him, at the woman's discretion, to the alternative of marriage or a jail—the former of which was generally chosen as the least present evil. Under these influences female chastity had, in many districts, so far ceased to be valued as a virtue, that not only the woman herself, but her parents and her husband, seemed, where the law had had its full effect, to have become indifferent to it.

"The evils of the system were not confined to the paupers, but extended to all who had to administer the law. So large a fund as between seven and eight millions, administered without any practical responsibility, naturally tempted the cupidity of the officers through whose hands it passed. The office of overseer was, therefore, generally sought by a class of small farmers and tradesmen, to whom the office must have been most burdensome had it been discharged gratuitously as the law provided. It was found that the overseers were usually appointed, in places where the evil had reached a great height, not from the class of the *substantial householders* of the parish, as the statute of Elizabeth requires, but were usually needy persons to whom the indirect advantages of the office were important, and who were helped into the office by the efforts of persons similarly interested, either as tradesmen of the parish, or as owners of the dwellings which the paupers inhabited, or in other ways, more as receivers, directly or indirectly, of the rates, than as rate-payers. The spirit of the enactment in the 45 Geo. III. c. 54, § 1, which provides that no contract for the lodging, keeping, or maintaining of the poor, or for taking the benefit of their work for their better maintenance, shall be valid, unless the person with whom it is made shall be resident within the parish, was fully carried out in practice in nearly the whole of the 15,000 parishes and places separately maintaining their own poor, every tradesman of the parish, and every employer of labourers, being bribed to maintain whatever system the vestry adopted, by a share in the profitable supply of the parish poor, or by the payment of a part of the wages of his labourers in the shape of relief to them out of the rates. The refractory parishioners were constrained to acquiesce, on pain of losing these and similar advantages, which, being withdrawn or denied, left to them only the obligation of paying those rates. To secure the full operation of this system, the parish was not permitted to

* *Edinburgh Review.*

deal elsewhere for any commodity with which any parishioner could supply it, and was thus usually confined to the very worst market for the goods it purchased, in the same manner as, by the settlement laws, it had been cut off from the supply of other labourers while any belonging to the parish remained unemployed.

"The evidence seems also to prove that the functions of the magistracy had almost invariably ceased to be applied to the objects for which they had been created. The magistrates of counties were usually too dispersed, and too little immersed in the actual business of the several parishes, to avail themselves of the advantages which the overseers and the other more immediate administrators of the system derived from it. The magistrates of corporate boroughs, towns, and cities, were, however, in many instances, found to be not less rapacious or ready to apply the administration of the law to their pecuniary profit or direct advantage than the parochial officers. But although the magistracy must generally be acquitted of having sought to derive an immediate pecuniary advantage from the administration of the poor-laws, they were none the less ready to pervert the law to purposes utterly at variance with its original purposes and with the prosperity of the community. Very many of the magistrates, influenced by benevolent intentions, were ready on all occasions to admit the claim of the pauper, and to compel overseers to administer relief when they inclined to refuse it: such magistrates were constantly resorted to by paupers in preference to others who more vigilantly examined the grounds of their claims; and a reputation for being the *poor man's friend* was easily earned by the lavish and immoderate expenditure of the fund of the general rate-payers. This reputation was found to be useful in many ways, and was thus sought for political purposes, or for the attainment of local power, or for the mere gratification of vanity, by many magistrates whose sympathy for the pauper would never have been excited if it had been incapable of being gratified at the expense of the rate-payers. When it is considered that the county magistrates lived in the midst of a population of willing paupers, and the means of annoyance which the latter possessed, if they found occasion to use it, against an obnoxious person, are also borne in mind, it is not to be wondered at that the magistracy generally purchased the good-will of their neighbours by sacrificing the interests of the rate-payers, whom they never had personally before them, and who were very inadequately represented by the overseer, whose interests were too frequently found to coincide more with the demand of the pauper and the inclination of the magistrate than with the strict line of his duty."*

In consequence of the report of the commissioners, an act was passed (4 and 5 Will. IV.), usually called the *Poor-Law Amendment Act*, by which these monstrous evils were for the most part extinguished, and a return made to the just principles and practices dictated by the acts of 1601 and 1723. Both parties in the state supported this measure in almost all of its provisions,† and it was only opposed by a few individuals. With regard to the impotent poor, this act rather increased than diminished the liberality of the arrangements, while it made several other considerable improvements. The great class of adult persons who, from old age or infirmity of body, are wholly unable to work, were to remain, as before, entitled to a support by means of out-door allowances. Of destitute children, those unlikely from natural defects to be able to win their own bread, were provided for by out-door relief; those, on the other hand, who were likely to prove useful members of society, were taken in charge and reared in separate establishments, where their education and training for industrious callings were particularly cared for. Judicious provisions were also made for their being ultimately set afloat in the world, as apprentices. With regard to illegitimate children, several former provisions of evil tendency were annulled, and it was provided that no regard should be paid to them till they became actually chargeable upon the parish, when relief should be extended through the mother, she being in this respect treated as a widow. Persons unable to support themselves through accident or from sudden and dangerous illness, were to receive temporary relief, and to have all necessary medical attendance. Insane paupers were to be placed in proper asylums at the expense of the public.

The provisions for *able-bodied* claimants formed the most important part of this act, as indeed it was in this department that the abuses of the old system were the most glaring. The main feature of the new arrangements was the erection of workhouses by unions of parishes, where relief should be offered to able-bodied claimants, on the condition of their giving their labour in return, and submitting to the rules of the establishment. This was only a revival of the *test* applied by the act of 1723, the object being to check applications for relief from the slothful, and to throw upon the able-bodied in general the duty, which is everywhere else the lot of free-labourers, of finding work for themselves. The new law contemplated that the food and accommodations of the workhouse should be good and sufficient, but yet not quite so good as those which the free labourers of the district could obtain by their own exertions; so that it might, upon the whole, be more agreeable to the able-bodied man to work for himself than become chargeable. At the same time, it being acknowledged that a change from one system to another could not be expected to be suddenly effected, provision was made for enabling the administrators of the law to exercise a humane discretion in applying the new regulations.

Some material changes were made in the machinery for the administration of the poor-laws. The rate-payers elect for each union of parishes a board of guardians, each rate-payer having votes in proportion to his property, and the proceedings of these boards are under the control of a central board, composed of three commissioners appointed by the crown. Under the chief commissioners there are twelve assistant ones, each of whom inspects a particular district, and reports upon whatever he sees amiss, with a view to its being amended.

Gradually, under the operation of the Poor-Law Amendment Act, the greater part of England has been formed into unions, each under a board of guardians and each provided with a workhouse. Down to 1841, there were 588 unions formed, including all the parishes excepting about eight hundred, and a population, by the census of 1831, of 12,182,031 persons. In the first year of the new system, the commissioners issued a general order, prohibiting relief in money to the able-

* M'Culloch's Statistical Account of the British Empire, vol. i. pp. 615-16.

† To prove what is here stated, all who know any thing of parties, and their connections in this country, will be ready to own that no better means could be fallen upon, than to make such extracts as the following from the two leadings *Reviews*:—

The *Edinburgh Review* of March, 1831, after remarking that the intended benevolence of the allowance system had proved a "bitter curse;" that it robbed the rate-payer to pay farm labour, and enslaved the labourer; adds that "*its abolition is the imperative duty of the legislature.* We say abolition, for nothing short of this can be of any material service."

The *Quarterly Review* of January, 1834, after making an extract from the part of the Commissioners' Report drawn up by Mr. Chadwick, says, "It is gratifying to us to find the immediate abolition of the allowance system here insisted upon so strongly. We might have wished this suggestion to have taken precedence of every other, as being *by far the most important and indispensable of any.* * * An improvement in the management of work-houses is highly necessary. *They should be made places of strict confinement and hard labour to the able-bodied,* with a moderate diet, and a *total denial of all indulgence*, in order to render a residence within their walls *as irksome and distasteful as possible*, and the last resource of those only who cannot, by their utmost exertions, obtain a maintenance elsewhere.

bodied in the employment of individuals, thus throwing their entire support upon their masters. In the second year, they began, in a cautious manner, in obedience to the spirit of the act, to put a stop to out-door relief to the able-bodied—meaning labourers who, with their families, are in health, but excepting widows with young children. This order was issued at first to sixty-four unions, and afterwards it was applied to others, until the total number to which it was extended was, in May, 1841, 437, comprising a population, according to the census of 1831, of 7,372,021 persons. By these means the expenditure upon the poor was reduced from £7,511,219 in 1834 to £4,044,741 in 1837, or almost to one-half. Since 1837, the expenditure has again been on the rise, and in 1840 it was £5,110,683.

The first effects of the stop put to the allowance system was most surprising. The so-called surplus population—the hordes of unemployed men who had required to be partially or entirely sustained by the parish funds, who had been condemned to stand in the parish pound for days, and spend half their lives in a kind of idleness in the parish gravel-pits—disappeared as if by magic. It was found that, left free to seek employment where it could be had, and furnished with the usual motives to exert their industry, they all obtained employment. On this subject the earlier reports of the commissioners gave some valuable information, showing how delusive must have been those views which held forth the population as redundant, and as needful of artificial support. The whole evil seemed to be one of derangement. Once disengaged from the trammels which confined men to certain spots of ground and put a bounty upon their remaining idle, the people quickly fell once more into natural arrangements, and there was an independent maintenance for all. To quote an able writer on this subject—"When the bonds which confined them to their parishes were broken, they distributed themselves where their services were most wanted. When they were allowed the free disposal of their services, they endeavoured to make those services valuable. When the application of more efficient labour increased the employer's returns, and at the same time reduction of rates diminished his outgoings, he had a larger fund for the purchase of those services. The redundancy vanished with its causes. The able-bodied pauper is the result of art. He is not the natural offspring of the Saxon race. Unless his pauperism is carefully fostered by those who think it their interest to preserve it, he rapidly reverts to the *normal type*—the independent labourer."*

The union workhouses are in general remarkably well-arranged establishments. The food, both in quality and quantity—the accommodations of all kinds—the moral discipline and order, are in general all that the humane and the enlightened could wish. The arrangements for the education of the young are particularly worthy of commendation. Workhouses are for the most part occupied only by some portion of the aged poor, and by young children. Though held open for the reception of the able-bodied under any exigency to which they may be presumedly liable, they are rarely resorted to by such persons, partly because, the labour-market being freed, there is in general no lack of means for an independent subsistence, and partly from the natural dislike to a life of restraint. One regulation of these houses may be supposed to have operated powerfully in keeping idle married men at a distance from them. In most instances, they are not allowed to live in the same part of the house with their wives. Partly this was needful for the sake of order, and to avoid sundry gross evils which flourished under the old system. Partly it is owing to a principle laid down by the commissioners, that a pauper is not entitled to be in this respect on a level with the man who works for himself and his family. The regulation has attracted much censure, and perhaps it would have been much better, at least in a point of expediency, not to have had it introduced.

The new law was enacted for only five years. It has been oftener than once renewed for a brief period; and there is at this time (Autumn 1841) a general expectation that, before being renewed permanently, it will be considerably altered. Excellent as the measure has been in its main features, and though it has redeemed the English labouring classes from a kind of slavery, it has been the subject of an outcry of the most violent character. This is partly traceable to those who profited by the abuses of the old system, partly to an ignorant sentimentalism, and partly to the arts of politicians. There is too much probability that this outcry will prevail to a considerable extent, and that England is about to see some of the worst abuses of her old poor-laws restored.

ARRANGEMENTS RESPECTING THE POOR IN SCOTLAND.

The poor are provided for in a much more sparing manner in Scotland than in England; and the able-bodied, so far from having even the offer of maintenance in a workhouse, are totally overlooked.

The early acts of the Scottish parliament respecting the poor, contain, like those of the English parliament, only provisions for the repression of begging. At length, in 1579, an act, apparently suggested by one of the English parliament seven years earlier, introduced the principle of a compulsory assessment for the impotent poor, providing at the same time that able-bodied beggars should be punished as vagrants. The administration of this law was committed to justices of peace, which class of functionaries did not then exist, but were contemplated, though no such appointments in reality took place at that period. Acts of 1592 and 1663 ultimately committed the management of the poor, in country parishes, to the heritors (proprietors) jointly with the kirk-sessions—the latter being parochial ecclesiastical courts, composed of the minister and a small body of lay elders—and to the magistrates in royal burghs. From these administrators there is no appeal except to the supreme civil court of the country (Court of Session), an arrangement of course equivalent to there being no appeal at all. Three years' residence confers a *settlement*.

In 236 parishes, containing 1,137,646 persons (nearly the half of the population of the country), a legal assessment has been resorted to. In 126 parishes, with a population of 305,654, there is what is called a "voluntary assessment," which may be considered as only a regulated and equitable mode of voluntary contribution. In the remaining 517 parishes, containing a population of 872,628, there is no assessment whatever, and the funds for the poor arise from voluntary contribution, chiefly in the form of offerings at the church doors. The average annual sums collected under this system during the years 1835, 6, and 7, were—by collections at the church doors, £38,300, 10s. 2d.; by other voluntary contributions, £18,976, 10s. 2d.; from sessional fees, &c., £20,604, 12s. 10d.; from assessment, £77,239, 19s. The aggregate is £155,121, 12s. 2d. It is remarkable that the whole sum here described as raised by assessment, being for 236 parishes, including Edinburgh, Glasgow, and all the other considerable towns in Scotland was just about a seventh more than the sum raised for the poor in *one London parish* in 1833 (St. George's, Hanover Square).* In Scotland, the expenditure for the poor is equal, on the average of the above three years, to 1s. 3¾d. a head on the population; in England,

* *Edinburgh Review*, lxxiv. 33.

* The sum raised for the poor in that parish in 1833 was £67,336. The new law reduced it in 1835 to £27,391.

during the same period, the expenditure was equal to 6s. 10½d. a head on the population.

As might be expected, the provision for individual paupers, is, in Scotland, extremely slender, and almost everywhere a vast number of claimants are altogether rejected. In the two workhouses of Edinburgh, for example, the average annual expense for each inmate is from £6 to £8. Excepting in these instances, the provision for the poor in Scotland may be said to consist in a small weekly dole of money, considered as a loan or aid, for which the relations of the parties, or the parties themselves, might afterwards be held chargeable, supposing that their circumstances allowed of its being refunded. In the case of persons who, from infirmity, fatuity, or infancy, can do nothing for themselves, and who at the same time have no relations able to aid them, the dole is considered as a full provision for maintenance: from 2s. to 4s. are given in such cases. Where any remains of health and strength exist, the allowance is usually less in proportion, and may be said to range from 6d. to 2s. a week. It is in these cases considered strictly as an aid, in addition to what the individual can gain by personal exertions. In the unassessed parishes, the average allowance was, a few years ago, £1, 0s. 4½d. per annum. The administrators of the funds (usually the kirk-session) subject every application for relief to a rigid scrutiny, and never continue any relief when they think it ceases to be strictly necessary. Generally, it may be said, the provision is more liberal in towns than in the country, and in the Lowlands than in the Highlands. In the last districts the funds for the poor are extremely small. "There is something," says a late writer, "approaching to the ludicrous in finding the minister of Alness, in Ross-shire, saying, in his statistical account, that people come to his parish for the benefit of its poor allowance: the fund is £58, 18s. 4d., divided among 110 paupers, the highest annual allowance being £1, and the lowest 6s. If we make allowance for a resident and humane landlord, and take a glance at the provisions in the neighbouring parishes, we shall find, however, that this choice is not made without reason. In the very useful report of the General Assembly in 1839, we find that Dingwall, the immediate neighbouring parish, gives an annual uniform allowance of 5s.; Foderty gives a maximum of 12s. and a minimum of 2s. 6d.; Cairnach a maximum of 12s. and a minimum of 4s.; Edderton a maximum of 8s. 6d. and a minimum of 5s. 6d.; Knockbain a maximum of 10s. and a minimum of 5s.; and Kirkmichael a maximum of 10s. and a minimum of 3s. 6d. These are all annual allowances; nay, there is one parish called Criech, which gravely reports itself as giving its poor a maximum of 3s. a year, and a minimum of 1s. Intense, indeed, must be the misery that makes human beings barter independence for sums like these. It is only by knowing such facts that an Englishman can comprehend how the 7s. a month of Edinburgh and Glasgow, given only to those who suffer under permanent bodily disability, should exercise a power of attraction at 200 miles' distance, and stand forth as the crowning and rich reward of a toilsome journey, and three years of patient suffering. And yet, it seems, that it is not alone among those who obtain the wretched pittances of the Highland parishes that we are to look for the misery of the land; we must take into view those who are denied the boon. The report of the Assembly, speaking of the numbers who in the Highlands and Isles are denied a place on the poor's roll, gives the following characteristic illustration:—

"'The parish of Kilmuir, in the Island of Skye (cutting off the district attached to the parliamentary church of Steinscholl), contains a population of 2275; the average amount of funds, distributable among the poor, is about £3 annually, and a distribution is made only once in two years. The last distribution, prior to the date of the return (21st August, 1838), took place on the 3d March, 1836, when the sum of £6, 3s. 6d. was divided among 68 paupers.' The minister states, 'As the amount of church collections has varied little for several years back, it has been found necessary to restrict the number of paupers to about 60 or 70 at each distribution; but, were the funds of greater amount, it would be necessary to admit no fewer than 200 paupers on the roll.'"—*Westminster Review*, xxxvi. 394.

The smallness of the provision for the poor in Scotland, is not to be rashly attributed to want of feeling on the part of the nation. There is in Scotland a strong prejudice against all but self-dependent modes of existence. It is a general opinion that all systematic succour held out to the poor is productive of evil instead of good, even to the poor themselves. This succour is thought to be particularly detrimental, when it is the result of a fixed assessment or rate, for then it is supposed that the poor are led more particularly to depend on the public charity instead of their own exertions or the kindness of relatives. The smallness of the sums given to the helpless, can only be attributed to this general prejudice against pauper relief; for it may be presumed, that, if there were another feeling in the case, the ordinary slender funds would be augmented by a sufficient assessment. What proves very strikingly that opinion, and not want of benevolent feeling, is the main cause of the small provision, is, that the humbler classes in Scotland have, in general, as great a disinclination to ask public charity, as the wealthier classes to give it. They are generally anxious to avoid resorting to the kirk-session as long as possible, and only do so when all other resources fail. This, we say, is generally the case, for of late years there have been strong symptoms of a change of feeling on this subject among the Scottish people.

Practically, the Scottish poor are only in part supported by public provision. Everywhere, private benevolence steps in to give a share of the maintenance required. There is thus a constant contention between two principles; the session being anxious to throw as much of the burden as possible upon private parties, while private parties, on the other hand, only give what the session pertinaciously withholds. There is also a constant contention between one court of relief and another. A penurious parish, striving, as the phrase is, to *keep down the roll* as much as possible, drives off the poor to other places, where, possibly, an assessment allows of a somewhat handsomer provision, and where a new settlement can be acquired in three years. From the Highlands to the Lowlands, from country parishes to towns, there is a constant flowing of paupers, under the attraction of better allowances. There have even been instances of niggardly parishes extending aid for the purpose of enabling their paupers to acquire a settlement in towns. It has been found that, among the dependants of public charity in Edinburgh, only 871 are natives, while 1931 are from other places—234 of them being from the five northern Highland counties, two hundred miles distant. On the Dundee poor's roll, there are 344 natives, and 655 from a distance. On that of Aberdeen the disproportion is still greater, 420 to 1097.

Till a recent period, scanty provisions for the poor, and the repression of pauperism, were subjects of pride in Scotland. In the evidence taken by the English commissioners a few years ago, the practice of this northern kingdom was held up in favourable contrast with the ultra-liberality of the English system. It used to be a boast with a kirk-session, that it had few or no poor, or that they were kept down at little more than nominal allowances; and the opposite case of an assessed parish would be pointed to, as a proof of the fatal nature of such a mode of poor-relief, the parties altogether overlooking

the fact, that they themselves, by denying or stinting relief in their own district, were the great causes of the undue burden that befell their neighbours. It was at that time that Dr. Chalmers propounded his schemes for an improved management of the poor, the main features of which were, that voluntary contributions at the church-doors should be the sole fund looked to for public relief, (a compulsory tax being considered as tending to throw benevolence out of action)—that the kirk-session should take all charge of the poor—that they should, in the first place, when a claim was made, endeavour to make the parties help themselves by their labour; if totally unfit for work, then throw the burden upon relatives; if there were none such with any means, then upon neighbours, no matter how poor; and only when all such means failed, was any public relief to be given;—a plan so obviously inequitable, as tending to save the rich at the expense of the poor, that it has never, to our knowledge, met with a single advocate besides its author.

A considerable change in public opinion upon this subject has been wrought by the publication of a pamphlet by Dr. Alison, of Edinburgh.* The object of this essay is to prove that the system of excessive restriction pursued in Scotland is attended by evils which ought to make it a subject of shame rather than pride to the community. He contends that, in large towns more especially, it is productive of wide scenes of misery, shocking to all benevolent feeling, and positively dangerous in some respects to the rest of the inhabitants. He shows, that in Edinburgh, Glasgow, Dublin, and other large cities, where there is no adequate system of relief for the poor, fever has been of late years prevalent to a degree quite unknown in any English town—a fact which must in the main be ascribed to the wretched condition of great hordes of people gathered in the meaner parts of those cities. Will it be believed that, in two late years, one-*sixteenth* of the population of Edinburgh, and one-*sixth* of the population of Glasgow, were affected by dangerous fevers? The average number of cases treated in the hospitals of Glasgow during the last seven years, has been 1842, while in Leeds, where the inhabitants are a little more than a half, the average for the same period has been 274; and in Newcastle and Gateshead, where the inhabitants are about a fourth, only 39; there being in Bath, during the same period, "only a few cases." It is true, that want of cleanliness, bad ventilation, and so forth, are proximate causes of fever; but Dr. Alison contends, and apparently with success, that destitution is the main and primary cause. He also shows that, as fever is more apt to carry off the adult than the young, it burdens the public with immense numbers of orphans, many of them the children of persons who, if spared, would have kept them above public charity. Thus, so far, the restrictive system seems to spread, instead of limiting, the evil of pauperism. When a fatal epidemic breaks out in one of the towns in question, subscriptions are generally raised by the wealthy classes to succour the suffering poor; and the evil is thereby perhaps alleviated in some, but only in a slight degree. The victims of the pestilence have been prepared for it by years of unrelieved suffering, and that generosity which once might have prevented disease, is now unable to arrest its calamitous progress.

The popular doctrine in Scotland is that advanced by some political economists, that systematic relief for the poor leads to habits of improvidence, and encourages marriages among persons unable to support their offspring, thus tending to increase, instead of diminishing, pauperism. Dr. Alison, on the contrary, maintains that "poor-laws, such as exist in England, do not interfere with moral restraint, but support and strengthen it; and that moral restraint is nowhere so feeble, and population (in a long-inhabited country) nowhere makes such rapid progress, as where there is no legal provision for the destitute, and where therefore the prospect of destitution is always clear, obvious, and immediate." A pauper population is increased by the continuance of a state of abject poverty and a want of the necessaries of life. He says—"Below a certain grade of poverty, the preventive check of moral restraint has no power. Twenty-five years of observation of the habits of the poor have shown me, that there are none among whom population makes so rapid progress as those who see continually around them examples of utter destitution and misery. In such circumstances, men hardly look forward to the future more than animals. It is easy for us to say, that by cutting off from a poor family any prospect of relief, in case of destitution, we can make them careful and prudent. The practical result is widely different. Another alternative is uniformly embraced. *They lower their habits;* and those who have not been accustomed to observe them, are not aware how much reduction of comfort the family of a labouring man, disabled or deprived of employment, may undergo, and not only life be preserved, but the capacity for occasional irregular and precarious employment continue. On the other hand, when men are preserved from this state of hopeless and abject destitution, they all (or with few and trifling exceptions) gradually fall, more or less, under the dominion of *artificial wants*, and form to themselves a *standard of comfort*, from which they will never willingly descend, and to maintain which they will keep themselves under a degree of restraint unknown to those of the poor who are continually struggling to obtain the first necessaries of life."

The object of Dr. Alison's pamphlet has been opposed by various writers; but the views upon which he proceeds have not been satisfactorily replied to, and they have unquestionably made a considerable impression on the public mind in Scotland. The conviction is spreading that the present system is inequitable with respect to districts, and nowhere so liberal as a true policy, not to speak of humanity, requires.

ARRANGEMENTS RESPECTING THE POOR IN IRELAND.

In Ireland, there was till a recent period no systematic provision for the poor, but the country was by no means destitute of institutions designed for their benefit.

Legislative enactments had progressively, during the last century, established county infirmaries, dispensaries, lunatic asylums, houses of industry, and receptacles for destitute infants and old people; and similar institutions, together with schools, lying-in hospitals, houses of refuge, and mendicity houses, had been set on foot in various places by private benevolence. But, while much was thus done for the alleviation of temporary and casual distress, there was a mass of mendicancy, and an amount of general suffering from occasional famine and consequent epidemics, which made Ireland singular among the countries of Europe. It was calculated that, out of a population of between seven and eight millions, upwards of two millions were in a state not much short of permanent mendicancy. The great bulk of the people being an agricultural peasantry, living on small patches of land, and depending mainly on the potato crop, a failure of that product was attended with wide-spread misery, invariably followed up by destructive fevers. The epidemic of 1817, which was the effect of the failure of the crop of 1816, affected a million and a half of persons, and carried off 65,000. The people, moreover, having no resources when they lost possession of their little pieces of ground, and lords found that they were rapidly

* Observations on the Management of the Poor in Scotland, and of its Effects on the Health of the Great Towns. By William Pulteney Alison, M.D., F.R.S.E., Professor of the Institutes of Medicine in the University of Edinburgh. Blackwood and Sons: 1840.

losing all power over their property. Desperation made the tenants cling to their ground with a pertinacity which nothing could overcome. A common danger having united them in one common cause, the forcible extrusion of a tenant was resisted by one and all, or, if effected, it was sure to be savagely avenged. Practically, the tenant was able to remain on the ground as long as he chose, without much regard to the payment of rent, unless his *good-will* was purchased either by the new tenant or by the landlord. The inconveniences experienced in consequence of the bulk of the people being thus always on the verge of destitution, and without any resource when they reached that point, had become, in addition to those of actual mendicancy, so grievous, that a poor-law began to be contemplated as necessary for Ireland; and in 1833 a royal commission was issued for an inquiry into the subject.

In consequence of the report of this body, an act was passed (1 and 2 Victoria, c. 56), for the introduction of a modified poor-law into Ireland. In the principal arrangements, those adopted in England under the Poor-Law Amendment Act were followed; and the general superintendence was confided to the same commissioners. The system is still in its infancy; but it has so far worked well. In March 1841, 127 unions had been formed and declared, and 60 workhouses were in progress, or in operation. It is anticipated that three more unions will be all that are necessary.

GENERAL OBSERVATIONS.

Poor-laws are, after all, only an expedient for meeting an evil partly inherent in human nature, and partly the consequence of its erroneous moral and political condition. Were all born equally sound, and were all so instructed and so placed socially that each man realized a reasonable sum for his labour, and was disposed to make a proper use of his gains, there would be no need for poor-laws. Such conditions not existing, this expedient is unavoidably called into use, and we must not be surprised that, as one designed to meet great evils, its own operation is attended by less ones. By far the worst effect of poor-laws is the moral degradation which they produce in those for whose benefit they are established. The man who has to ask for public relief to his necessities, loses from that moment the self-respect on which much of his virtue depends. A fatal lesson is taught him—that his wants may be supplied without his own exertions—and the motive to an independent and industrious course of life is greatly shaken, perhaps destroyed. This is itself an evil of such serious magnitude, that it forms with many an insuperable objection to all regular provisions for paupers. Such may be said to have been, till a recent period, the public feeling of Scotland on this question, and it still is the predominating sentiment of a large portion of society in that country. It is an objection which we, for our own part, would have difficulty in overcoming, if we did not see around us the awful effects which an inadequate provision for the poor works, in the present condition of society. Unquestionably, nothing but a consideration of the horrible inhumanity, and the extreme dangers to the common weal, which are inseparable from the neglect or repulse of pauper claims, could excuse the deterioration which we unavoidably effect in a man's nature, by giving him that for which he has not laboured.

Another great evil of poor-laws is, that they take away part of the fruits of industry from those who have legitimately acquired them, and bestow them upon the idle. Industry is by this means discouraged, and sloth and improvidence are in a proportionate degree fostered. In England, this had reached to an enormous height, and even now the abstraction of five millions from the gains of the industrious, must operate very seriously in retarding the progress of the country. It is, however, as already said, a tax unavoidable in present circumstances, if we would escape more serious evils.

While a reasonable doubt can scarcely be entertained as to the propriety of both succouring the helpless and offering a modified provision to the able-bodied in a needful state, it must be equally clear that the more that habits of foresight and self-dependence are propagated in the country—the more that all-sustaining moral influences are diffused through it—we may expect to see the less need for poor-laws. Although there are upwards of twenty millions in savings' banks, and benefit societies are widely spread, still the great bulk of the labouring classes of this country live from hand to mouth, without any store whatever on which to fall back in the event of sickness or an occasional lack of employment. This is a preposterous state of things. What is to be expected of a people, the great bulk of whom are contented to live with only a little accident between them and a state of dependence on private or public bounty? Sickness is what all are liable to at all times; failures of employment take place at frequent intervals everywhere. There surely might be some better provision against such contingencies than a public provision, which makes the recipient a degraded man for ever. Individuals might be induced, by an improvement of the moral agencies of the country, to do much for the securing of their own independence, and the remainder of the required provision might perhaps be obtained by systematic contributions from the labouring classes towards a common fund, from which succour could never be a degradation, seeing that they had themselves created it. Proposals of this kind are apt to strike the mind unfavourably, from their being new; but the position at which this country has arrived is in some degree new, and accordingly calls for measures of a different kind from what we are accustomed to contemplate. Certainly, while only the expedient of poor-laws is adopted, the community can never be inspired, in all its departments, with that manly and independent feeling which is the inseparable associate of all the other virtues, and the great distinction between the freeman and the slave.

LIFE-ASSURANCE.

Life-Assurance, in its ordinary character, is a means of securing, by a present payment in full, or of an annual payment, a sum to be realized after the decease of the party.

It is obvious that, to many persons, the having this in their power is of great importance. To none is it so important as to individuals in the middle walks of life, who, for the present, are perhaps able to maintain their families in comfort, but being unable to accumulate a large surplus capital, cannot be sure that, in the event of their death, those dependent on them will not be thrown into poverty. To such persons, life-assurance presents itself as a ready and convenient means of providing for those in whom they are interested. With a certain annual sum laid aside from a professional income, or from the profits of trade, such a person can make sure that, though death cut him off abruptly, his widow and children will have something to look to, either for an entire maintenance, or to aid in enabling them to gain one for themselves. By the same means, an individual, possessing an entailed estate, can make provision out of its current rents for those younger and female children, who, at his death, would cease to be benefited by it. An individual, also, incurring a risk in behalf of another, or having a large claim upon him in the form of a debt, can insure upon the life of that person such a sum as would be sure to cover all loss, in the event of that person's sudden death. There are many other circumstances in which life-assurance may become highly bene

ficial; but its chief utility lies in securing a certain sum to helpless persons, in the event of the decease of those on whom they depend

The principle on which life-assurance mainly rests, is one which it has been reserved for modern times to discover, namely, that, while the duration of the life of a single person is of all things the most uncertain, it is possible to ascertain, with tolerable clearness, how many of a *multitude* of persons of a particular age will die within next year, how many in the second year, how many in the third, and so on. The medium or average gives what is called the *expectation of life* for each person of the set. A certainty, in short, is attained on this proverbially uncertain subject, when we take a great number of persons, and consider them with regard to the circumstances in which they live. It is found, for instance, that, of 100,000 persons, aged 52, residing in this country, the number who will die before another year has elapsed, will be about 1521, or rather more than one and a half per cent. Supposing that these 100,000 persons were to associate for the purpose of making sure that the widows or other heirs of all those who died within a year should have £1000. It would only be necessary, in that case, for each person to contribute as much to a common fund as would make up £1,521,000, or a thousand times 1521; that is to say, each would have to pay in £15, 4s. 2d. It is clear that those who died, or their heirs, would profit to the extent of £984, 15s. 10d.; but without injury to those who survived, for these also had their chance of gaining, for which it was but fair that they should pay. This would be a simple transaction in life-assurance, and may serve to convey an elementary idea of what life-assurance is, though, in practice, the transactions are usually of a somewhat more complicated kind.

An assurance is rarely transacted for a single year. The object of most is to pay a certain sum each year, as long as they live, in order that a sum may be realized at their death. Assurers are also of various ages; the young have the expectation of longer life than the old. It therefore becomes proper that they should pay less than those more advanced in life. Indeed, there ought to be a payment appropriate to each particular age; and this, accordingly, is the case. Another point calls for particular consideration. The payments being made, not to clear off one year's claims, but to make good a sum many years hence, large funds become accumulated, and upon the improvement of these much depends. If a high rate of interest is obtained, the funds experience a rapid increase, and the less payments are required to effect insurances. If, on the contrary, the interest realized be small, the insurers require to make their original payments so much the higher.

Life-assurance is effected in this country either in offices established by joint-stock companies, who look to making a profit by their business, or by mutually assuring societies. The former are shortly called *proprietary*, and the latter *mutual* offices. Offices of the first kind are usually held by a joint-stock copartnery, with a large subscribed capital; and the chief advantage which they hold forth, is the ample security for all claims presented by the capital, and the respectability of the shareholders. In the case of a mutual office, there is only, it may be said, an association of customers, each of whom is concerned in insuring his neighbour. In this case, however, all surplusages, instead of going into the hands of a trading company, remain the property of the insurers, and are liable to be divided among them. For a long time, the business was conducted almost exclusively by companies; but it was at length seen that all desirable security was to be obtained on the association principle; and for some years this system has been advancing much more rapidly than the other. In various instances, companies have scales of charges allowing of a participation in surplusages; and these are usually called *mixed* proprietary and mutual offices.

The existing British offices are about eighty in number, most of them of recent origin. The oldest is the Amicable, of London, established on the mutual principle in 1706. At the time when it was set up, no calculations as to life existed; and the conductors were accordingly obliged for many years to proceed in a great measure at random, charging the same premiums or annual payments for all ages under forty-five! The other offices, dating from the last century, are the following:—The Sun, 1710, proprietary; the Union, 1714, mixed; the London, 1721, mixed; the Royal Exchange, 1722, proprietary; the Equitable, 1762, mutual; the Westminster, 1792, proprietary; the Pelican, 1797, proprietary; and the Palladium, 1797, mixed. Ten were established during the first ten years of the present century:—The Globe, 1803, proprietary; the Albion, 1805, proprietary; the London Life-Association, 1806, mutual; the Provident, 1806, mixed; the Rock, 1806, mixed; the West of England, 1807, mixed; the Hope, 1807, mixed; the Eagle, 1807, mixed; the Atlas, 1808, mixed; and the Norwich Union, 1808, mutual. The rates charged by these offices are very various, but in all cases they have been found sufficient for the risks. In most instances, the companies divide large profits, while the mutual offices have realized equally large surplusages, which they have divided amongst the insurers, in proportions according to the sum assured and the duration of the insurance, or upon some other principle which may be thought preferable.

Life-assurance grew up in the last and present centuries amidst such an imperfect knowledge of the data on which it depends, that there is little to be wondered at in the great variety of rates charged by the different offices. These data are now much better understood, and it has become possible to arrive at a comparatively close estimate of what charges are really required from an individual, in order to make good a sum at his death for the benefit of his survivors. There might be greater closeness still, if the laws of mortality, now so well ascertained, were alone concerned; but the rate of interest upon money also enters into the calculation, and this, as is well known, is liable to fluctuation. Loose as the matter thus remains in some measure, enough is ascertained to admit of an approximation being made to something like a standard for the conducting of this important branch of business.

The rate of mortality and the rate of interest upon money are the two principal data on which life-assurance practically depends. We shall first consider

THE RATE OF MORTALITY.

Tables of mortality are founded on the assumption that human life is of a certain average endurance; and by means of them we estimate the number of deaths that may be expected among a given number of individuals, from the proportion that has been observed to occur among another class similarly circumstanced.

The tables of mortality adopted in this country as the basis of calculation for insurance companies, are *three* in number. That known by the name of the *Northampton table*, is the oldest now in use. It is founded upon observations made by the celebrated Dr. Price, of the deaths registered for the population of one of the parishes of the town of Northampton, during the years between 1735 and 1780. This table, it is now acknowledged, shows far too high (or rapid) a rate of mortality, owing partly to no effect having been given to the fluctuations in the population of that parish, from immigration and other such causes, and partly to the great improvement which has taken place in the value of life since the middle of last century, consequent upon the introduction of vaccination and other improvements in medical

science, as well as in the habits and modes of living of the people. In 1827, a select committee of the House of Commons, appointed to investigate this subject, reported—"The evidence appears to your committee to be strong and decisive in favour of the use of tables which give an expectation of life higher than the Northampton. In truth, there is not even a *prima facie* case in their favour."

The *Carlisle table* was formed, not from the register of burials among a floating population, but from observations of the deaths which occurred, at each year of life, among a certain stated number of persons in the town of Carlisle. The observations were conducted by Dr. Heysham, and the calculations made, in the most scientific manner, by Mr. Joshua Milne, author of a valuable work on annuities.

Finally, the *Government tables* were compiled from observations on the progressive mortality occurring among the government annuitants and other selected classes, distinguishing the sexes. They were prepared, under the directions of government, by Mr. Finlaison, actuary to the National Debt; and in 1829 were adopted by parliament as the basis upon which their future calculations should proceed. Mr. Finlaison's researches established the fact of the longer duration of female life. He also observed "a very extraordinary prolongation of human life" in the course of the time over which his inquiries extended—so great "that the duration of existence now, as compared with what it was a century ago, is as 4 to 3 in round numbers."

Besides these three, a table was framed by Mr. Griffith Davies from the deaths reported from time to time among the members insured in the great Equitable Society of London, from its commencement in 1762 down to 1829, which has since been recalculated and continued down to a later period by Mr. Morgan, the actuary to that society. This table is very valuable, as confirming the substantial accuracy of other observations, with which it very nearly corresponds. The relation which these tables bear to each other may be seen at a glance from the following table, showing the *mean expectation of life* at various ages according to each.

At Age.	By Northampton.	By Carlisle.	By Government.			By the experience of the London Equitable.
			Males.	Females.	Mean.	
20	33·43	41·46	38·39	43·99	41·19	41·67
25	30·85	37·86	35·00	40·81	38·36	38·12
30	28·27	34·34	33·17	37·57	35·37	34·33
35	25·69	31·00	30·17	34·31	32·24	30·93
40	23·08	27·61	27·02	31·12	29·07	27·40
45	20·52	24·46	23·75	27·81	25·78	23·87
50	17·99	21·11	20·30	24·35	22·33	20·36
55	15·59	17·59	17·15	20·79	18·97	16·99
60	13·21	14·34	14·39	17·32	15·86	13·91

Independently of the acknowledged deficiency of the data on which the first-mentioned table is founded, the mere fact of its differing so much from any other authentic observation, is of itself conclusive against it; and, by parity of reasoning, the close agreement of the others affords strong presumptive evidence in their favour, and imparts a high degree of certainty to calculations based upon them. The Carlisle table occupies a mean place between the male and female observations of government, showing a somewhat shorter duration than the mean of these. It also coincides very nearly with the experience of the Equitable Society. Considering that it is thus supported by two other sets of observations, and that the whole three extend over a period during which life was not so good as it has since become, the general opinion in favour of the safety of the Carlisle tables for life-assurance may be held as well founded. This opinion receives corroboration from the experience of the Scottish Widows' Fund, which extends over the last twenty-five years. In 1834, the auditor of that society reported, as the result of a careful investigation, "that the expected number of deaths by the Northampton table, which is the table of the society, is to the actual number during the whole progress of the society, as 100 to 57; and the proportion of the expected number by the Equitable experience is to the actual number as 100 to 87." We have understood that the experience of the Scottish Widows' Fund since 1834 is even more favourable to life. If, then, we were to take the whole twenty-five years' experience of this society as a criterion we should come to the conclusion that the Equitable experience, the Carlisle tables, and the Government mean, are considerably within the verge of safety, while the Northampton tables are so far from the standard of modern life as to be, particularly with regard to the younger class of lives, quite unfit for use.

We have now to advert to

THE RATE OF INTEREST,

meaning the rate at which the yearly premiums may be expected to be improved.

This subject is one which does not admit of the same certainty as the other, and on which, accordingly, there may be great differences of opinion. In 1829, Mr. Finlaison writes—"I take it for granted that it will be considered safe enough to assume that money, in a long course of years, will so accumulate, through all fluctuations, as to equal a constant rate of 4 per cent.; because, in point of fact, money has hitherto accumulated at 4½ per cent., whether we reckon from 1803 or from 1783." Other writers, again, and among them Mr. De Morgan, looking chiefly to the high price of the 3 per cents. of late years, say that not more than 3½ per cent. should be counted on. Practically the investments of assurance offices are made on terms much more favourable. It appears, from the published report of the Edinburgh Life-Assurance Company, dated December, 1838, that for the three preceding years (1836, 1837, and 1838, when interest was unusually low), the average rate realized on their funds was £4, 16s. 6d. per cent.—about 1½ per cent. higher than the return from the 3 per cents. during the same time. And this, it is stated, was obtained without any part being laid out in the purchase of reversions—on which, it is known, a much higher rate can be got. The example of this office is quoted merely from the circumstance of their report happening to state the precise return at that period. Other Scottish offices are said to have obtained a higher rate. Most of them state that their funds are invested "about," "at," or "above," 5 per cent. Indeed, it is not conceivable that the offices could make such large returns to proprietors and members, in the shape of dividends and bonuses, if they did not generally improve money at about the rate last mentioned. From all of these circumstances, it does not appear likely that calculations for life-assurance, in which the interest of money is assumed at *four per cent.*, will, while Britain remains in nearly its present condition, prove unsound.

EXAMPLE OF LIFE-ASSURANCE CALCULATION.

According to the Northampton tables, out of every 11,650 persons born alive, there will be 46 living at the age of 90. From these tables being ascertained to be unfavourable to life, this must be understood as not strictly the case, but it may be adopted for the sake of illustration. The same tables make it appear that, of the 46, 12 will die in the course of the first year, 10 during the second, 8 during the third, 7 during the fourth, 5 during the fifth, 3 during the sixth, and the last remaining life will fall in the course of the seventh year. It is a favourite mode of exemplifying life-assurance calculation, to suppose these 46 persons, aged 90, associating for the purpose of assuring £100 to each at death

They are supposed to proceed upon the principle of paying all that is required in one sum at first, thus forming a fund which is to answer all the demands which are to be made upon it. In this calculation the improvement of money has been assumed at 3 per cent. The object is to ascertain what sum, by way of present payment, each is to contribute to the fund, so that it may discharge £1200 the first year, £1000 the second, £800 the third, and so on. In order to discharge

£	£	£	s.	d.
1200, at the end of the first year, the society must be provided with	1200, discounted at 3 per cent., for one year, - -	1165	1	0
1000, at the end of the 2d year,	1000, ditto, for 2 years,	942	12	0
800, at the end of the 3d year,	800, ditto, for 3 years,	732	2	0
700, at the end of the 4th year,	700, ditto, for 4 years,	621	18	7
500, at the end of the 5th year,	500, ditto, for 5 years,	431	6	0
300, at the end of the 6th year,	300, ditto, for 6 years,	251	5	0
And in order to discharge the remaining £100 at the end of the seventh year, with £100, discounted at 3 per cent., for seven years, - - - - - -		81	6	2
In all, - - - - - -		£4225	10	9

This, divided by 46, gives £91, 17s. 2d. as the sum (technically called *premium*) which each person would need to pay in at the foundation of the society. And this sum of £91, 17s. 2d. is the present value of a *reversion* of £100, at the age of 90, according to the Northampton tables, and taking interest at 3 per cent.

Supposing such a society to be constituted, and £4225, 10s. 9d. to be paid in by the 46 members, we shall see how its business would proceed until, at the close of seven years, death put a period to the account:—

The original contribution of £4225, 10s. 9d. being put out to interest, at the end of the first year amounts to - - - - - - - - - -	£4352	5	2
From which deduct for the twelve lives which fail in the course of the year - - - - -	1200	0	0
Fund remaining at the commencement of the second year - - - - - - - - -	3152	5	2
Which, bearing one year's interest, will amount to	£3246	16	8
From which deduct for the ten lives which fail in the course of the year - - - - -	1000	0	0
Fund remaining at the commencement of the third year - - - - - - - - - -	2246	16	8
Which, bearing one year's interest, will amount to	£2314	8	2
From which deduct for claims - - - - -	800	0	0
Fund remaining at the commencement of the fourth year - - - - - - - - - -	1514	8	2
Which, bearing one year's interest, will amount to	£1559	16	8
From which deduct for claims - - - - -	700	0	0
Fund remaining at the commencement of the fifth year - - - - - - - - - -	859	16	8
Which, bearing one year's interest, will amount to	£885	10	5
From which deduct for claims - - - - -	500	0	0
Fund remaining at the commencement of the sixth year - - - - - - - - - -	385	10	5
Which, bearing one year's interest, will amount to	£397	1	8
From which deduct for claims - - - - -	300	0	0
Fund remaining at the commencement of the seventh year - - - - - - - - -	07	1	8
Which, bearing interest, will amount to - -	£100	0	0
Which will exactly discharge the last remaining claim - - - - - - - - - -	100	0	0

Practically, life-assurance is not effected upon lives so advanced as ninety years. It is common to confine business to ages under 60; and the great bulk of insurers are between 27 and 40, the time about which men in this country begin to feel the responsibilities of a family. But the calculations followed for the various ages are formed exactly in the above mode. All the persons of a particular age in a life-assurance society are considered as a distinct group insuring each other. Of those, for instance, at 30 years of age, it is calculated what proportion will die the first year, what the second, and so on; and from each the society looks for such a contribution, present or prospective, as may make up an aggregate sufficient, with the accumulation from compound interest, to pay the sum assured upon each life in that group. It is quite the same thing to the society, or, we shall say, to the general interest, whether the individual insurers pay the whole required contribution at once, or in a series of annual payments, which, as the plan convenient for most, is that generally adopted.

FORMATION OF RATES.

According to the principles of which we have given a slight outline, offices form scales of rates at which they profess to do business. In these rates a great discrepancy exists, for many continue to calculate mortality according to the Northampton tables, which, as shown, give the decrement of life too high; while others proceed upon those more recently formed, which are certainly much nearer the truth; and some, again, assume interest at only three or three and a half per cent., while others deem four not too high. There is also an allowance for the expenses of business to be added to the naked sums required by a regard to mortality and interest, and here also the minds of parties may differ, some allowing more and some less on this account.

In most cases, the charges for life-assurance are considerably within the verge of safety. Hence companies generally divide good profits, and societies realize large surplusages, which fall to be divided among the insurers, in the form of additions to the sums stated in their policies. The scales of the various offices may be classed in three grades or sets, of each of which we shall give a few examples, endeavouring, at the same time, to show how each particular grade of charges operates in the realization of profits and surplusages.

Scales of the first or lowest grade are followed as yet by comparatively few offices; but the number is increasing. We presume that they proceed upon modern tables of mortality, and the expectation of four per cent at an average, as, with regard to one of the following (the Scottish Provident), we have been informed that it follows the government table of males, and calculates upon money being improvable at the above-mentioned rate, adding from 10 to 15 per cent., according to age, for expenses of management, and as a guarantee against any unfavourable fluctuations of mortality and interest. We here, as elsewhere, limit ourselves to offices of undoubted probity.

	20	25	30	35	40	45	50	55	Total Premiums between 20 and 60.
Aberdeen Assurance Company, - -	£1 14 7	£1 18 1	£2 2 0	£2 7 3	£2 14 5	£3 4 6	£3 19 8	£4 10 0	£129 7 9
Standard L. Assurance Company, Edin., -	1 12 10	1 17 6	2 2 11	2 9 1	2 17 2	3 6 5	3 10 9	5 0 0	
Scottish Provident Institution, (mutual)	1 15 8	1 18 0	2 1 6	2 6 10	2 14 2	3 5 9	4 1 7	5 1 11	131 6 8

The high premiums borne by the stocks of the two above companies, form a tolerably fair evidence (notwithstanding their having also higher scales) that business can be profitably transacted at these rates. It may likewise be mentioned, that the Edinburgh Life-Assurance Company, which presents a scale nearly the same in aggregate amount as the above (£133. 4s.), divides 6 per cent. upon its stock, the £10 shares of which stand

at £14, 10s. in the market. The Scottish Provident is of five years' standing only; but it has done a large amount of business, and its experience as yet tends to show that the rates are considerably within the verge of safety. The following is a selection of respectable offices in which somewhat higher rates are charged:—

	20	25	30	35	40	45	50	55	Total Premiums between 20 and 60.
Economic Company, London.	£1 14 7	£1 19 0	£2 4 3	£2 10 11	£2 19 9	£3 11 9	£4 8 9	£5 10 3	£141 12 6
Norwich Union Society,	1 19 6	2 3 8	2 8 10	2 14 10	3 2 0	3 11 0	4 6 0	5 5 3	142 10 4
Guardian (mixed),	2 1 0	2 5 4	2 10 7	2 17 0	3 5 0	3 14 11	4 8 0	5 4 8	146 3 3
Scot. Widow's Fund Scot. Equit. Societies,	2 1 6	2 5 10	2 11 1	2 17 6	3 5 6	3 15 6	4 8 4	5 4 2	146 12 6

The Economic is a proprietary office, giving three-fourths of the surplusages or profits to the assured. It was established in 1823. In 1834, a bonus, amounting to 16 per cent. on the premiums paid, was declared; and in 1839 there was a second bonus, amounting to 31 per cent. on the premiums paid during the preceding five years. The Norwich Union, in 1816, gave a bonus of 20 per cent. on the amount of premiums deposited by the members insured previous to June 1815; a second bonus of 24 per cent. in 1823; and a third of 25 per cent in 1830. The Guardian is a proprietary office, in which a proportion of profits not stated is given to the assured. Established in 1821, its first division of profits was made in 1828, and a second in 1835. At each period, the bonuses averaged rather more than 28 per cent. on the amount of the premiums paid thereon during the preceding seven years. The Scottish Widows' Fund and Scottish Equitable have both declared large surplusages. At the division of the first of these highly prosperous societies, in 1825, the policies opened between 1815 (the commencement of the society) and 1820, were declared entitled to 2 per cent. for each year of their currency. In 1832, the same policies received a further addition of 3½ per cent.; and at the same time those opened between 1820 and that time, were declared entitled to additions amounting to 1½ per cent. per annum. In 1839, a retrospective bonus of 2 per cent. per annum was declared on all policies. The effect of these additions is, that policies for £1000, opened before 1820, at whatever age, will amount in 1845 to £1809, 8s. 7d. In 1841, the Scottish Equitable made its first division of surplusages, amounting to 2 per cent. per annum on all policies of above five years' standing; so that the heirs of a person who insured £500 in 1831, (the first year of the society,) would now, in the event of his decease, realize £600, and so on in proportion.

A third class of offices, adopting, like the preceding, the Northampton tables, and generally of old standing, and acting upon old calculations, present higher scales of rates, of which we shall give a few examples:—

	20	25	30	35	40	45	50	55	Total Premiums between 20 and 60.
Globe Company,	£2 3 7	£2 8 1	£2 13 5	£2 10 10	£3 7 11	£3 17 11	£4 10 8	£5 0 4	£151 5 2
Sun Company (mixed),	1 16 11	2 2 5	2 9 2	2 16 8	3 6 [illegible]	3 17 8	4 14 2	5 19 11	154 16 6
Amicable Society (London),	2 0 6	2 5 6	2 10 6	2 17 0	3 5 0	3 18 6	4 16 6	5 18 0	155 3 6

There are a few offices which charge still higher rates. The aggregate premiums of the London Assurance and National (mixed offices), are respectively £157, 0s. 8d., and £158, 3s. The London Life (mutual) is the highest, the aggregate of the scale being £171, 18s.

It is clear that, if business can be transacted by a company at a profit, on a scale of rates amounting in the aggregate to £129, 7s. 9d. (as in the case of the Aberdeen Company), the last set of rates ought to give companies very large profits, and societies equally considerable additions to policies. The scale of the Globe is also that of the Rock and Atlas, proprietary offices granting a share of profits to the assured. In the Rock, where three-fourths of the profits are divided, policies opened in 1806 for £1000, at whatever age, are now £2001, 11s. In the Atlas, which has not announced to the public the share of profits extended to the assured, policies for £1000, opened in 1816, ranged in 1837 from £1338 to £1789, according to age.

The high rates are defended on various grounds. A company making high charges, and consequently good profits, may be supposed to have more stability than one making moderate charges; while, of a society pursuing business on the same plan, it may be said that the overplus becomes a kind of bank deposit, to be ultimately realized by the depositor. With regard to companies, the defence may or may not be sound, according as business is managed discreetly or otherwise—and there certainly are offices of that nature, entitled to the most implicit confidence, although they present moderate scales. The defence is of greater force with regard to societies; but even there it is not free from objections. The high-rate societies, proceeding upon the Northampton tables, commit a constant injustice to young and middle-aged members, in favour of the old. The needless amplitude of their funds tend to occasion a less careful use of them in conducting the concern: there is, for instance, a greater temptation to give large commission to persons, who, as it is said, bring business; a practice in no respect different in morality from that of butchers and grocers who bribe cooks and butlers to favour them with their masters' custom. But the greatest objection to a needlessly high scale, is that it must act as an obstruction to the first step in what is generally one of the most important moral acts of a lifetime—the effecting of a life-assurance. We would here be understood to draw a broad distinction between an unsound low rate and one which is sufficient to satisfy a reasonable anxiety for security. Rates much below the first of the above three scales would be decidedly unsafe, taking all likely contingencies into account. On the other hand, it ought certainly to be possible to transact perfectly safe business upon a medium of that scale. Those who, for further caution, prefer the next scale, must be said to pay highly for it, if they resort to a company which gives no share of profits to the assured: if they become members of a society, large periodic additions to policies will be no more than their due.

In order to convey still more distinct notions respecting

rates of Life-assurance, we subjoin a scale of those which are required, exclusive of expense for management, upon the Carlisle tables, taking money variously at 4 and 3½ per cent.:—

	25	30	35	40	45	50	55
4 per cent.,	£1 10 4	£1 15 1	£2 0 5	£2 7 6	£2 15 6	£3 7 3	£4 5 8
3½ per cent.,	1 12 1	1 16 11	2 2 5	2 9 7	2 17 10	3 9 9	4 8 2

The rates actually charged by the offices which we have cited, may easily be compared with these. It will be found that the additions made for management and the security of the concern, even to the 3½ per cent. rate, are very considerable. The aggregate of the above ages at 3½ per cent., is £18, 16s. 9d.; and that of the same ages by the actual rate of the Aberdeen Company, is £21, 4s. 11d., or nearly 12¼ per cent. higher; that of the same ages by the Scottish Widows' Fund, is £24, 7s. 11d., or 29½ per cent. higher; while that of the London Amicable, is £25, 11s., or above 35½ per cent. higher.

MORAL DUTY OF LIFE-ASSURANCE.

On this subject we add some remarks from a paper in *Chambers's Edinburgh Journal*, No. 373. They are conveyed in language which is apt to appear unmeasured to one who has not given the subject much consideration—but, we believe, *only to him*.

"Such being the equitable and beneficial principles on which mutual-assurance societies are established, it is clear that they present, to men in the enjoyment of income, but possessing little property, a most suitable and favourable means of providing, in a greater or less measure, for the endeared and helpless relatives who may survive them. That only about 80,000 persons in the United Kingdom should have taken advantage of life-assurance, being but one in sixty-two of the supposed number of heads of families, surely affords a striking view of—shall we call it the improvidence of mankind, or shall we not rather designate it as their culpable selfishness? For what is the predicament of that man who, for the gratification of his affections, surrounds himself with a wife and children, and peaceably lives in the enjoyment of these valued blessings, with the knowledge that, ere three moments at any time shall have passed, the cessation of his existence may throw wife and children together into a state of destitution? When the case is fully reflected upon, it must certainly appear as one of gross selfishness, notwithstanding that the world has not been accustomed to regard it in that light. It is unquestionably the duty of every man to provide, while he yet lives, for his own: we would say that it is not more his duty to provide for their daily bread during his life, than it is to provide, as far as he can, against their being left penniless in the event of his death. Indeed between these two duties there is no essential distinction for life-assurance makes the one as much a matter of current expenditure as the other. One part of his income can be devoted by a head of a family to the necessities of the present; another may be stored up, by means of life-assurance, to provide against the future. And thus he may be said to do the whole of his duty towards his family, instead of, as is generally the case, only doing the half of it.

"It may be felt by many, that admitting this duty in full, their income is nevertheless insufficient to enable them to spare even the small sum necessary as an annual premium for life-assurance. The necessities of the present are in their case so great, that they do not see how they can afford it. We believe there can be no obstacle which is apt to appear more real than this, where an income is at all limited; and yet it is easy to show that no obstacle could be more ideal. It will readily be acknowledged by everybody who has an income at all, that there must be some who have smaller incomes. Say, for instance, that any man has £400 per annum: he cannot doubt that there are some who have only £350. Now, if these persons live on £350 why may not he do so too, sparing the odd £50 as a deposit for life-assurance? In like manner, he who has £200 may live as men do who have only £175, and devote the remaining £25 to have a sum assured upon his life. And so on. It may require an effort to accomplish this; but is not the object worthy of an effort? And can any man be held as honest, or any way good, who will not make such an effort, rather than be always liable to the risk of leaving in beggary the beings whom he most cherishes on earth, and for whose support he alone is responsible?"

For a further account of modes of life-assurance, we refer to article SOCIAL ECONOMICS OF THE INDUSTRIOUS ORDERS.

PAGAN AND MOHAMMEDAN RELIGION.

PAGANISM is a disbelief or ignorance of the only true God, the Creator and Preserver of all; and in this debased and unhappy state all mankind appear to have been, until illuminated by the light of revelation and cultivated reason. In this state of mental darkness in which many savage and but partially improved races are found, Paganism may be said to prevail. Of this Paganism, however, there are evidently various degrees—some forms of religious belief ascending much higher than others, from the blinded reverence of *gods* made from blocks and stones, up to the worship of a plurality of creators, preservers, and destroyers.

It is generally allowed that the lowest forms of religious belief are those which prevail among the Negro tribes in the central and western parts of Africa, and which consist in the reverencing and worshipping of objects usually classed under the name of fetishes. The word *fetish* or *fetich*, which is believed to be from the Portuguese language, signifies any object in nature or art to which, by a process of consecration, a supernatural or divine power is supposed to have been communicated, and which is therefore deemed worthy of religious veneration and worship. A fetish is thus a kind of idol, or visible representation of deity, and may be ranked with the household gods and presiding genii of the Egyptians, Greeks, and other nations of antiquity. The rude natives of Africa seem to possess no rule to determine the kind or number of their fetishes; it is a matter of free choice, so that whim and accident, much more than any definite feeling, settle which shall be the revered objects of their hopes and fears. There are national, local, and private fetishes; and besides one which is the tutelary genius of every single individual, the Negroes provide themselves with many others for particular purposes. Like the ancient inhabitants of Ethiopia, Nigritia, and Egypt, they often take along with them upon their journeys a living animal as a fetish, which is preserved with extraordinary care. Inasmuch, also, as the ancient Egyptians and their neighbours went to war on account of injury or insult to their gods—on one occasion there was a furious religious war between the cat and rat worshippers—so vindictive wars and dissensions spring up between Negro tribes, if either maliciously or accidentally kill or injure a fetish of the other.

The Moors of Northern Africa, who, as Mohammedans, are opposed to the worship of idols, are attached to fetishism. They honour the fetishes as divine beings of an inferior rank, and carry them about their persons as amulets or charms. In Whiddah, and other parts of Africa, towards the south, a small insect, called the creeping-leaf, is highly honoured; he who gets a sight of one considers it a happy omen, and he who kills one despairs of success; the serpent, also, is worshipped as a fetish in temples by priests set apart for the purpose. In Benin, fetishes are more numerous, and, in part, of an entirely different description. The whole material universe is believed to be animated and furnished with spiritual powers; water, land, animals, stones, trees, and vegetables of every description, are all full of divine spirits and secret influences. He who makes any eatable article his fetish, touches nothing of that sort whatever, whilst he consumes, without the slightest hesitation, what others consider holy. There is a depth and mystery in this superstition which cannot be very clearly understood. As far as can be reasonably conjectured, this species of fetishism implies a connection betwen the visible and invisible, and that every thing may by certain means be made to have a relation to man and his destiny. The quality of the thing arbitrarily set apart and invested with an attribute of divinity, is of no consequence; it may be a piece of bone, egg-shell, or clay, indeed no matter what; there must merely be a belief of a relation subsisting between it and man, which relation often commences only for the first time when the thing is consecrated; in a word, every thing properly consecrated and revered as the residence or tangible investiture of deity, is supposed to have a divine power, which, when evoked, is able to incline the Deity to comply with the wishes of men. Under different names, this superstitious reverence for visible objects has prevailed in all ages and countries. At Cape Coast there is a rock projecting into the sea, invested with the character of a fetish, and worshipped by the priests, who annually offer sacrifices to it, with ridiculous gestures and strange invocations. In the great temple of Mohammedanism at Mecca, there is a stone which is the object of unbounded respect and adoration. The Lacedæmonians had a sacred stone, which, at the sound of a trumpet, is said to have raised itself to the surface of the water, from the bottom of the Eurotas. The ancient Germans and Gauls had also their holy rocks, caves, seas, springs, and trees, which afforded miraculous aid, and delivered oracles. In Iceland there was a stone in which a divine spirit was supposed to reside, and was therefore an object of religious worship. The Laplanders had a sacred mountain and a consulting drum. All these superstitions are not a whit more respectable than the belief of the Negroes in fetishism; they are, indeed, almost the same thing.

According to the visionary ideas of some ancient sages, a divinity was supposed to reside in matter, and to be liable to be roused from his latent state into activity, by means of consecration and the performance of solemn mysteries. In some of the islands of the Pacific, if any person wishes to protect his property, such as a house, field, or place of sepulture, from robbery or intrusion, he declares that it is *tabooed*, or placed under the guardianship of his gods; and the belief that such is the case being universal, the property is safe from aggression. Mr. Ellis, in his "Missionary Tour through Hawai," mentions some interesting particulars regarding the superstitious delusions of the natives, which incline us to think that these remotely situated people must have had some early connection with the ancient natives of Asia and Africa, from whom the Greeks and Romans imported their learning and mythological observances. These Hawains, as we are told, previous to their embracing Christianity, believed in a number of ideal gods, who were ministered to by priests, and were propitiated by sacrifices of animals: in making these sacrifices, the diviners observed "the manner in which the victims expired, the appearance of the entrails, and other signs. Sometimes, when the animal was slain, they embowelled it, took out the spleen, and holding it in their hands, offered their prayers. If they did not receive any answer, war was deferred. They also slept in the temple where the gods were kept, and after the war-god had revealed his will by a vision or dream, or some other supernatural means, they communicated it to the king and warriors, and war was either determined or relinquished accordingly." The images of the gods who constituted the guardians of the tabooed places of sepulture, are described as figures oddly carved in pieces of wood; these were stuck on the fences and trees of the enclosure, and with their horrid aspect and ragged garments, seemed no improper emblems of the system they were designed to support. Adjoining the sacred enclosure,

the author was shown a *Pohu Tabu*, or city of refuge, which was open for the reception and security of all classes of delinquents, and resembling in its regulations the sanctuaries of antiquity. These, and some other circumstances mentioned by Mr. Ellis, open an interesting field for speculation on the probable connection of ancient and modern superstitions, or at least on the similarity of the delusions by which the untutored human being has in all ages been affected.

Fetishism has long been practised among the Negroes of the West Indies, under the name of *Obeah* or *Obi*—a term most likely originating in Egypt and the adjacent parts of Africa, where anciently there was a deity of a demoniacal character, with the name Ob, or Oub, and from which Moses commanded the Israelites to abstain from making inquiries. Obi is therefore one of the exploded oracles of the ancient world, which has been carried by captured Negroes to the West Indies, and there set up as an oracle and the patron of incantations, charms, and all other superstitious delusions. The adepts who practice this kind of fetishism are called Obeah-men, or Obeah-women, for both sexes engage in the mysteries of this species of jugglery and imposture. We believe, that since the abolition of slavery in the West Indies, and the spread of education and Christianity, the practice of Obi has gone out of repute and notice.

At one period the religion of the Parsees or Fire-worshippers existed throughout Persia and other parts of Asia, but is now confined chiefly to the deserts of Caramania, towards the Persian Gulf, where it is followed by the Guebres or Giaours (infidels), as they are called by the Mohammedans. The great prophet or improver of the Parsee religion was Zoroaster, who flourished about two thousand years ago, and taught the doctrines of there being an eternal spirit of Good or Light (Ormuzd), and an eternal spirit of Evil or Darkness, (Ahriman), with a vast number of inferior good and bad genii. In this there was a glimmering of a pure theism; but besides a variety of absurd imaginations respecting the organization of nature, the belief in one God was obscured by a typical worship of the sun, and of fire, both being supposed emanations, or at least emblems, of the spirit of Good and Light. Fire-worship, as practised by the Persian magi, disappeared before the spread of Christianity and Mohammedism, and, as we have said, exists chiefly among the Guebres, a detached remnant of the old Persian nation.

HINDOOISM.

Hindooism or Brahminism is the religion professed by a majority of the inhabitants of Hindostan; and while possessing the force of great antiquity, it is supported by a skilful priesthood and the division into castes, rendering it the most ineradicable of any system of false belief and worship which exists.

The Hindoos recognise the existence of a supreme and invisible Ruler of the universe, entitled Brahma, but at the same time believe in the existence of other two deities, one of whom is Vishnu the Preserver, and the other Siva the Destroyer. Previous to the creation, Brahma is said to have reposed in silence and self absorption—a mode of existence considered by the Hindoos as the most perfect and god-like. Having a desire to draw out of his own divine essence a glorious creation, to supplant the deep primeval gloom, he by a thought created the water, and deposited therein a golden egg, blazing like ten thousand suns, which remained inactive for millions of years, till Brahma, who lay enclosed in this shining receptacle, by the energy of his own thought, split it asunder, and sprang forth the Divine Self-Existing, famed in all worlds as the creator of rational beings and the forefather of all spirits. Brahma is represented as a golden-coloured figure, with four heads and four arms; but although he gives names to the great caste of the Brahmins or priests, no sects derive their appellation from him; he attracts little attention or worship, and he has neither temples erected, nor sacrifices offered to him, nor festivals celebrated in his honour.

Vishnu makes a very conspicuous figure in the sacred annals of India, and the fundamental idea of the Hindoo religion, that of metamorphoses or transformation, is exemplified in the *avatars* or appearances upon earth of this deity. In his character of preserver, or rather deliverer, he has, says the Vedas, interposed whenever any great calamity threatened the world: and thus the great ends of his providence are brought about by the various incarnations of the Hindoo deity. Of these transformations there are ten, and they fill up the Indian *yugs*, which compose a certain series of periods intended to effect a junction with God, and comprising 4,320,000 years. The yugs have been considered as an allegorical description of the year, divided by the solstices and equinoxes, and of the procession of the equinoxes. Nine avatars have already taken place, and the tenth is yet to come.

It is unnecessary to dwell at any length on the wonderful and ridiculous avatars of Vishnu. He first appeared in the character of a fish, for the purpose of recovering the sacred writings given by Brahma, which had been swallowed by a giant (typical of the rebellious human soul,) and buried along with himself in the depths of the ocean. He successively appeared as a tortoise, a boar, a man-lion, what is called the Brahmen or linguin dwarf, and so on. The transformations are of the most ridiculous nature; and were we to recite them, they should only excite pity for the ignorance of the wretched believers in such absurdities.

In his subsequent avatars under different forms, Vishnu delivered the world from successive monsters and giants which threatened its tranquillity. In the ninth avatar, which is supposed to have taken place in the year 1014 before the Christian era, Vishnu assumed the form of Boodh, the author of a rival creed distinct from that of Brahma. It appears pretty evident that Boodhism at one time very extensively prevailed throughout India; and several great dynasties, particularly that of Magadha, were Boodhist. But a war having taken place between the devotees of Brahma and those of Boodh, the latter were worsted, and dispersed throughout the countries to the east and north of Hindostan, and Boodhism is no longer professed in India. The rival systems will be noticed after we have described the other deities, male and female. In the tenth avatar, Vishnu will descend to the earth mounted on a white horse, and armed with a scimitar blazing like a comet, to root out evil from the earth, and eternally to punish the wicked. Vishnu is represented of a black or blue colour, with four arms, and a club to exercise chastisement on the wicked. The emblems under which he is represented refer to his vindictive character. He has three eyes, to denote the three great divisions of time past, present, and future. A crescent in his forehead refers to the measuring of time by the lunar revolutions, as a serpent denotes it by years; and the necklace of skulls which he wears, the extinction of mankind in successive generations.

The third member of the Hindoo triad is Siva the Destroyer. It may be here remarked, that the distinguishing appellations applied to these deities are not altogether characteristic of their functions—Vishnu the Preserver frequently employing himself in acts of destruction, and Siva on the other hand in acts of beneficence. But much vagueness, inaccuracy, and confusion, prevail throughout the whole of the Hindoo creed; and this no doubt arises from the love of the marvellous and indescribable, by which they are led to grasp at phantoms of thought as undefinable as they are impalpable. Siva, it appears, has had an equal share of personal adventure with Vishnu, although the characters

which he assumed were not so various, nor his exploits so important or striking. His female partner is called Doorga, and to her the appellation of destroyer is more applicable than to him. She is the chief among the female deities; in short, the most formidable and warlike personage of the Hindoo pantheon. She has rivalled Vishnu in the number of forms which she has assumed, and the conflicts in which she has borne the most conspicuous part; and the giants and others who have fallen victims to the prowess of her arm, occupy a prominent place in the wild records of Hindoo mythology. As an object of adoration, the appearance which she is made to assume shows a remarkable obliquity of moral vision in those who framed at first, and those who worship still, this horrible personage. Under the name of Kalee, she is black, with four arms, wearing two dead bodies as earrings, a necklace of skulls, and the hands of several slaughtered giants circling her waist like a zone. Her eyebrows stream with blood; and not content, as the male divinities generally are, with the simple productions of nature, her altars are made to flow with the blood of animal oblations. Old records even give directions how human sacrifices are to be offered to this cruel goddess. India has no deity more popular, not only among banditti, who hold her in especial veneration, but with the more reputable classes of the community, who offer lavish gifts on her shrine. The disgrace of her religion consists in the worship of impure imagery, which it is impossible to mention.

It is unnecessary to enumerate even the more important of the minor deities; as for the whole, they are altogether innumerable. Some have taken the trouble to reckon up three hundred and thirty millions of them. There are gods of the elements, of war, of the sun, of the winds, of fire, of water, and so on. Every river, fountain, and stream, is either a deity itself, or has one presiding over it. The worship or deification of the Ganges forms a distinguishing element in the belief of the Hindoos. Into this large river, all who dwell within a certain distance of its banks crowd morning and evening to bathe; and the water of this sacred stream is carried to all parts of India, and is sworn by in courts of justice. At Allahabad, where the streams of the Ganges and Jumna unite, the country for many miles round is considered sacred ground; and so great is the number of pilgrims who resort thither for bathing, that the vizier has received in one year half a lac of rupees for permission to enjoy the benefit of immersion in the sacred flood. Oftentimes may be witnessed children hurrying their parents to the river side, fearful lest they should die before being able to reach its banks. Nothing can be more distressing to the feelings than to behold these poor expiring creatures, some calling upon Rham, some upon one of their false gods, others upon another, with their bodies half in the water and half out, the rising tide soon to overwhelm them. Many are laid where the tide cannot reach them, and their case is more pitiable still. Beneath a burning sun, they are left without food, and many of them, who would no doubt recover from their disease, if proper attention were paid to them, are literally starved to death, or devoured by jackals at night.

Among the degrading doctrines of the Hindoo faith, a veneration for and even a worship of members of the brute creation, is not the least remarkable. The cow, in particular, commands the most exalted reverence; and this venerable quadruped may be seen in cities sauntering up and down in the most public places, perfectly at her ease, and calling forth expressions of profound respect. The monkey, like those ranks among the higher grade of animals, and is allowed to roam at large wherever he lists—a chartered thief, now levying the confectioner's sweetmeats under tribute, and anon taxing the fruiterer for a portion of his juicy store. But this superstition reaches its climax in the hospitals which are erected for affording shelter and succour to sick and infirm brutes, including lice, fleas, and other insects. It must be an exceedingly nice investigation for those who preside as medical attendants over such institutions, to determine the state of health of such patients. Other animals besides these are held sacred, but some quadrupeds are treated with great cruelty. The draught horses, in particular, Bishop Heber informs us, are barbarously abused; nor is there much sympathy shown to human beings, who are allowed to perish from disease or hunger under the canopy of heaven, without awakening a sigh in the bosom of the onlookers. Lepers are regarded as objects of divine wrath, and are treated accordingly, sometimes being burned or buried alive.

The peculiar character of the Hindoo creed is derived from their tenet respecting the transmigration of souls. The spirits of the dead are said to enter a receptacle corresponding to the previous character of the individual. The immortal part of the just and good, however insignificant the person may have been, migrates into a hermit, a Brahmin, a demigod, and so forth, rising in dignity according to the degree of merit. The wicked, on the other hand, not only are degraded as human beings, but are compelled to lodge in the bodies of animals. The Hindoo oracles endeavour to establish a degree of conformity between the punishment awarded and offences committed. The pilferer of grain is metamorphosed into a rat, and he who stole fruits or roots becomes an ape. Others are degraded into worms, insects, and so on. The person thus lowered in the scale of creation, must pass through a long succession of degraded births before he can re-assume the human form. This system of rewards and punishments, although confined to the earth, does not exclude the belief of a heaven and a hell hereafter. The celestial mansions, like those of the Mohammedan, are replete with objects of voluptuous enjoyment, but only Brahmins and persons of high attainments or great sanctity are permitted to enter these blissful abodes. Some ardent devotees aspire to a higher destiny, and hope to be absorbed into the essence of the Supreme Being, where they shall repose for ever on an unruffled sea of bliss. The place of final punishment, in like manner, consists of different compartments, the penalties inflicted in which correspond to the iniquities of those who are doomed to enter their dismal precincts.

The devotion of the Hindoos consists in a system of ceremonious observances, not only troublesome in themselves, but encroaching on the moral duties, nay, the whole business of life. Such a stock of atoning merit is by this means conferred, that the weightier matters of the law seem to be superseded; at all events, this external devotion is not inconsistent with the most scandalous crimes. The observances commence in the morning with ablutions and prayers, the worship of the rising sun, in the inaudible recitation of their holy writings, in meditation, and the like. The five sacraments are then performed, which are, teaching and studying the sacred books, offering cakes and water, an oblation of fire, in giving rice and other food to living creatures, and in receiving guests with honour. The whole of these ceremonies are necessarily abridged, for the entire day would scarce suffice for their perfect [illegible] The early Hindoos seem to have borrowed, and to have greatly extended, the typical impurities of the Mosaic law; and the rules on this subject, pointing out the causes of defilement and the modes of purification, are numerous and absurd. The death or birth of a child, touching a dead body, a new-born child, an outcast, and so on, render people unclean; and the modes of purification are either bathing, stroking a cow, looking at the sun, or having the mouth sprinkled with water.

Penance and self-torture are regarded as essential to the attainment of a character for holiness; but in their attempts to suit the amount of penance to the magnitude

of the offence, there is almost a total subversion of all moral distinctions. Acts naturally indifferent are classed with heinous immoralities; for instance, eating things forbidden is put on the same footing with killing a friend, and drinking forbidden liquor with killing a Brahmin. A particular class of devotees, called *yogues* or *fakirs*, signalize their piety by enduring the severest tortures with a firmness and perseverance worthy of the holiest cause. These consist in burying themselves in the depths of forests, either in a state of perfect nakedness, or having their bodies coated with ashes and cow-dung; in allowing the nails of their hands and feet to grow till they assume the dimensions and appearance of bird's claws; roasting themselves before huge fires; immuring themselves in the ground, and leaving only a small breathing-hole; going about with small spears or rings pierced through the most tender parts of the body, and hot irons applied to the side; holding their hands above their head till they have lost the power of bringing them down again, and become withered like that of the individual mentioned in the Evangelists; clenching the fists till the nails penetrate the palms; turning their faces to the sun till they cannot regain their natural position, or gazing on his intense blaze till their eyesight is extinguished; lying on [illegible] tearing the flesh with whips; chaining themselves for life to the foot of a tree; and performing other such-like acts of slow suicide. Some of their austerities are exceedingly fantastical; for instance, Bishop Heber saw a devotee hopping about on one foot, having made a vow never to put the other to the ground, which was now shrivelled up, contracted, and useless. Begging holds a conspicuous place among the religious duties of the Hindoos. Mr. Ward affirms that an eighth part of the inhabitants of Bengal and Behar subsist in this manner; thus constituting a mendicant population of upwards of two millions. Religious pilgrimages are held in high esteem, and the holy places have generally been established near the sea, the sources and junctions of rivers, the tops of remarkable hills, hot springs, caves, waterfalls, and places of difficult or dangerous access. All the principal roads are crowded with people hastening to these holy places. Some are held in higher veneration than others, and it is no uncommon occurrence, in the crush and tumult of the multitude to reach these Bethesdas, for numbers to be trodden to death under foot, or precipitated into the water and drowned.

The sacred writings of the Hindoos are of two kinds —the Vedas and Shastres. The former may be termed their scriptures, the latter expositions of them. The Vedas are divided into four books, all written in the Sanscrit language. The first book is called *Rug Veda*, which signifies the Science of Divination, concerning which it principally treats. The second is distinguished by the title of *Shecham*, which signifies Piety or Devotion, and this book treats of religious and moral duties. The third is the *Judga Veda*, which, as the word implies, includes the whole science of religious rites and ceremonies. The fourth is denominated *Obater Bah*, or the knowledge of the Good Being, and accordingly this book comprehends the whole essence of theology and metaphysical philosophy. These various books are acknowledged to be of great antiquity, but abound in such absurdities as to be of little or no value as historical documents.

The temples for the celebration of Hindoo worship appear to have been in ancient times of the most magnificent description, as is proved by the remains of those of Elephanta and Salsette. The temples of the present day do not exhibit such elaborate grandeur, many containing only one apartment, and few having more than three or four. The crowds which besiege them on solemn occasions celebrate their observances in an open area fronting the gates, so that nothing is required within but accommodation for the images and one or two attendants. The idols are composed of every possible kind of material, from gold down to wood or clay, smeared over with a little red paint. Any figure, either of brute or man, or centaur-like combinations of both, serves for a god, and is reverenced as such by the ignorant Hindoos, after a Brahmin has consecrated them by a process of solemn buffoonery. When placed in the temple, every image has a daily round of homage performed before it, and is furnished with a regular allowance of food, which, after remaining for a limited time, is served out among the attendants. These offerings are profusely lavished on great annual festivals, while the multitudes without sing indecent songs, and throw themselves into the most fantastical attitudes and motions. The various articles of maintenance bestowed upon the goddess Kalee, in her temple at Kaleeghata, are considered by Mr. Ward as worth £9000 annually.

There is no doubt that, at no very distant period, the bloody deities of the Hindoos were propitiated with human sacrifices, and, in confirmation of this, some of the rites still remain. Children were sacrificed by being thrown into the river Ganges, until the practice was put a stop to by the British government. Old women are still occasionally burned, in order that their spirits may haunt the spot where they are offered up, and entail a curse upon it. The *suttee*, or custom of a widow burning herself on the funeral pile of her husband, is a well-known rite of the Hindoo religion; and the festival of Juggernaut is celebrated by the sacrifice of numerous victims. This idol-car is a lofty ornamented structure, in which are representations of the god, and of Bala Rama and Soobhadra, said to be his brother and sister. This infernal machine, for it deserves no better name, is dragged along amid shouts of triumph by the infatuated multitude, and its path being marked by the bodies of mangled victims, who voluntarily throw themselves before the wheels, and are crushed to death. The most indecent figures are pourtrayed on the chariots used at the temples. With such an impure religion, it is not a matter of surprise that the state of morals is very low in India.

From time to time during the lapse of ages, various sectaries have arisen among the Hindoos, each with peculiar objects of adoration and modes of worship. Brahma, as already observed, is at the head of no sect; and Vishnu and Siva, the two powers next to him, divide in a great measure the worship of Indian devotees. Among forty-three leading denominations, Mr. Ward reckons twenty to attach themselves to Vishnu, nine to Siva, four to his wife Doorga, under the name of Saktas, while ten select inferior objects of adoration. The zealous adherents of the rival sects of Vishnu and Siva are avowed enemies, and hold each other up to odium and ridicule. But the most important schism is that between the disciples of Brahma and the adherents of Boodh, to which allusion has already been made. The latter have objects of worship, a creed, ceremonies, and institutions entirely peculiar. Their temples are much more splendid than those of the followers of Brahma, and their priests live in spacious convents. Boodhism is no longer professed in India-proper, but there is a sect called the Joinas, very numerous in Western Hindostan. They combine in some measure the practice and doctrine of the two rival systems above named. The Seika are a sect who have attempted to form an alliance between the Mohammedan and Hindoo creed, and with some degree of success.

Decidedly the most vicious part of the Hindoo religion is the division of the people into castes, or distinct classes, for such an arrangement strikes at the very root of social progress, and prevents all rational improvement. The whole Hindoo population is divided into four branches or tribes, denominated Brahmins, Kyetra, Bhysya, and Soodra. The rank, occupation, and duties of these

several castes, are fully explained in their Vedas, or holy books. The Brahmins are the priests; they are required to be virtuous, learned, just, peaceable, and self-denying. If these were ever the distinguishing traits of their order, the very reverse are the features of their character now. The Kyctra is the military caste: the Vedas require of them a thirst for glory; to die rather than retreat; generosity and princely conduct to captives. Bhysya form the agricultural part of the community; their duties are briefly defined as cultivators and traffickers. The fourth or Soodra caste, consists of labourers, who are enjoined to serve with patience and fidelity; the former, perhaps, they generally do, but as for the latter, it is only when constrained by fear of punishment or loss of pay. The two middle castes have almost become extinct, or rather amalgamated with the former and latter. Thus, it may almost be said that the whole Hindoo nation is now composed of Brahmins or Soodras, both of which are divided into a great many degrees or sub-castes, so that there are many orders of Brahmins as well as Soodras. Of the latter, the Koit is the highest, and the Hurry the lowest, which caste embraces shoemakers, mat-makers, bird-catchers, tanners, skinners, snake-catchers, and many others. By this division of caste, no possible means exist for any person to rise in the scale of society; all motives to exertion or mental improvement are cut off; no actions, however noble, no discoveries, however important to society, would ensure honour to a person of low caste; and those of high caste lose no honour or reputation by their ignorance and vice. Whatever be the mental abilities of a Hindoo, if born a Soodra, a Soodra he must remain; if the father be a snake-catcher, all his sons must be snake-catchers too; and the influence of caste follows him through all the ramifications of life. Persons of different castes or occupations cannot eat, drink, or smoke together; neither can they intermarry, nor meddle with each other's employment. If a Hindoo loses caste, which is the case if he breaks through any of the foregoing rules, the most distressing consequences ensue; no one will eat with him, or suffer him to come near his dwelling, or marry his children; his own wife and family disown him; looked upon as an outcast of society, he is deprived of all privileges, or means of comfort as long as he lives; and however respectable he may have been before, the meanest caste consider him a vagabond, and will not associate with him. It is caste that renders so many servants necessary to do the work which one or two might easily accomplish. They are born to one particular department of service, and no other can they perform without losing caste. Thus the man who fetches water cannot wait at table, nor the man who cooks the dinner serve it up; neither will the person who attends the table sweep the room afterwards—and so on through all the different pursuits of life. A native embracing Christianity loses caste by partaking of the Lord's Supper; it requires, therefore, great fortitude of mind to make a profession of faith in the gospel. There are many who have no caste, having been excommunicated because of some breach of the ceremonial laws of their religion, either by themselves or their forefathers; these are all termed Pariahs, and dare not touch the person, garments, food, utensils, or dwelling of a Hindoo of caste, as contamination follows. The Brahmins are a very lordly domineering race, and exact the most severe homage of the Soodras. They themselves are under great restrictions, as well as the Soodras, particularly in the article of food, being prohibited from eating any thing that has had life, except fish. This probably arises from their belief in the doctrine of transmigration; and as they believe that although the spirits of their ancestors may have entered the bodies of all beasts, birds, reptiles, and insects, yet they do not enter into another element, so that they may eat fish with impunity Rice, with spices, milk, and ghee, is their principal diet, although they may partake of the flesh of such animals as are offered in sacrifice to the gods, the laws of the religion permitting this.

The Brahmins, though all eligible to the priesthood, yet do not all follow it. Some enter the military service of the East India Company, and others become clerks and copyists; but none are permitted to engage in menial employments, and in whatever state they are found, the same **honour** is paid by their associates, though perhaps not to that degree as if in priestly office. So great is the pride of the Brahmins, that they claim precedence of kings, and the noblest rajah will partake of food cooked or presented by a Brahmin, while the meanest Brahmin will not taste that which has been prepared by a Soodra, although the Soodra should occupy a much higher station, civilly, than himself. The religion which inculcates these arrangements, is found to be almost unconquerable by Christian missionaries, for the adoption of Christianity involves a total change of opinion on the constitution of society; and it is a melancholy fact that few except the worst of the Hindoo populace will become proselytes. It is now generally acknowledged that in order to make any impression on the religion of the Hindoos, it will be absolutely necessary to commence with the instruction of the young in various branches of useful knowledge, to which happily the Brahmins offer no objection, while such instruction is universally desired by the people.

BOODHISM.

Boodhism, or the religion of Boodh or Bhud, is considerably elevated above either pure paganism or Hindooism, and is deeply interesting from being the most prevalent form of religion upon earth. The number of the whole human race being estimated at 965,000,000, nearly the one half, or 400,000,000, are Boodhists. According to the account of Mr. Howard Malcolm, in his "Travels in the Burman Empire," to whom we are indebted for the following particulars, Boodhism is professed by half of the population of China, Lao, Cochin-China, and Ceylon; all of Camboja, Siam, Burmah, Thibet, Tartary, and Loo-Choo; and a great part of Japan, and most of the other islands of the southern seas, are of this faith. In some parts of India it is the great rival of Hindooism; but its principal stronghold is in the adjoining empire of Burmah.

Gaudama.

"*Boodh* is a general term for divinity, and not the name of any particular god. There have been innumerable Boodhs, in different ages, among different worlds, but in no world more than five, and in some not any. In this world there have been four Boodhs, namely, Kan-ka-than, Gau-na-gông, Ka-tha-pa, and Gaudama. One is yet to come, namely, Aree-ma-day-eh.

"It has often been supposed that Boodhism resembles Brahminism or Hindooism, which is a great mistake. No two systems can be more opposite or bear less evidence of being derived from each other. Brahminism has incarnations, but Boodhism admits of none, for it has no permanent god. That has a host of idols; this only one. That enjoins bloody sacrifices; this forbids all killing. That requires atrocious self-tortures; this

inculcates fewer austerities than Catholicism. That makes lying, theft, and other vices, sometimes commendable, and describes the gods as excelling in these enormities; this never confounds right and wrong, and never excuses any sin. That makes absorption into deity the supreme good; this annihilation. In fine, I know of no important resemblance.

"Boodhism inculcates no principle of caste, which is a striking difference from what prevails among the Hindoos; and from this and other causes it is believed to be much more ancient as a religion than Brahminism. The probability seems to be, that Brahminism grew out of Boodhism, and gained power and numbers in Hindostan till the close of the first century of the Christian era, when the Brahmins were able to commence that persecution of which their own records speak, and which drove out the teachers of Boodhism into Farther India, whence it extended into China.

"The most extraordinary peculiarity of Boodhism is the want of any existing God. Adoration or respect is merely paid to the image of Gaudama, who was a god at a former period, but is now annihilated, or entered into annihilation. Gaudama was the son of a king, and born about 626 years before the commencement of our era. He had previously lived in four hundred millions of worlds, and passed through innumerable conditions in each. In *this* world he had been almost every sort of worm, fly, fowl, fish, or animal, and in almost every grade and condition of human life. Having in the course of these transitions attained immense merit, he at length was born son of the above-named king. The moment he was born, he jumped upon his feet, and, spreading out his arms, exclaimed, 'Now am I the noblest of men! This is the last time I shall ever be born!' His height, when grown up, was nine cubits. His ears were so beautifully long, as to hang upon his shoulders; his hands reached to his knees; his fingers were of equal length; and with his tongue he could touch the end of his nose! All which are considered irrefragable proofs of his divinity.

"When in this state his mind was enlarged so that he remembered his former conditions and existences. Of these he rehearsed many to his followers. Five hundred and fifty of these narratives have been preserved—one relating his life and adventures as a deer, another as a monkey, elephant, fowl, &c. &c. The collection is called *Dzat*, and forms a very considerable part of the sacred books. These legends are a fruitful source of design for Burman paintings. Of these I purchased several, which do but bring out into visible absurdity the system which they would illustrate.

"He became Boodh in the thirty-fifth year of his age, and remained so forty-five years, at the end of which time, having performed all sorts of meritorious deeds, and promulgated excellent laws far and wide, he obtained 'nic-ban,' that is, entered into annihilation, together with five hundred priests, by whom he had been long attended. This occurred in Hindostan about 2330 years ago, or B. C. 546. At his death he advised that, besides obeying his laws, his relics and image should be worshipped, and pagodas built to his memory, till the development of the next Boodh. He is invariably represented in the same manner, except that sometimes he is made to wear a crown, necklace, ornaments on his arms, &c. I have seen them of all sizes, from half an inch long to seventy-five feet—of wood, stone, brass, brick, clay, and ivory.

"The next Boodh is to appear in about seven or eight thousand years from the present time. His height will be eighty cubits; his mouth will be five cubits wide, and the length of the hairs of his eyebrows five cubits. The precise time of his arrival is not predicted. No laws or sayings of the first three Boodhs are extant. Those of Gaudama were transmitted by tradition, till four hundred and fifty years after his decease, when they were reduced to writing in Ceylon, that is, A. D. 94. These are the only sacred books of the Burmans, and are all in the Pali language. They are comprised in three divisions, each of which is divided into distinct books, or sections. The whole is called *the Bedagat*.

"According to the Bedagat, the universe consists of an infinite number of systems; each system consists of a great central mountain surrounded by seas, and four great islands, each surrounded by five hundred smaller ones. This earth is the southern cluster of islands, and we are living on the larger one. It is a convex plane, not a sphere; and is divided by mountains and navigable seas. Below its upper crust, on which we live, is water twice as deep as the earth is thick. The whole is supported on a stratum of air twice as deep as the water. Beneath is a vacuum. The celestial regions consist of twenty-six principal heavens, one above another; and the infernal regions of eight principal places of punishment, each surrounded by sixteen smaller ones. In one of the heavens, there are pleasant habitations for mortals after death; and at the king's principal residence there is an elephant of stupendous size. This animal is of immense height, and has seven heads; each head has sunken tusks, and each tusk seven tanks. In each of these tanks grow seven lilies; each lily has seven blosoms; each blossom has seven petals; each petal bears up seven palaces, and in each palace are seven nymphs, or wives of the king, each surrounded by 500 attendants. Another elephant has one great head, thirty uzenas long, on which the king occasionally rides; and thirty-two smaller heads, for the thirty-two royal princes. Of the principal bells, four inflict punishment by heat, and the other four by cold.

"Not only has the universe and all its systems existed from eternity, but also the souls of all the inhabitants, whether animals, men, or celestials. These souls have from eternity been transmigrated from one body to another, rising or falling in the scale of existence and enjoyment, according to the degree of merit, at each birth. This rise or fall is not ordered by any intelligent judge, but is decided by immutable fate. In passing through these various forms of existence, the amount of sorrow endured by each soul is incalculable. The Bedagat declares that the tears shed by any one soul, in its various changes from eternity, are so numerous, that the ocean is but a drop in comparison! Existence and sorrow are declared to be necessary concomitants; and therefore the 'chief end of man' is to finish this eternal round of changes, and be annihilated.

"The great doctrines of the faith are five—namely, 1. The eternal existence of the universe, and all beings. 2. Metempsychosis. 3. Nic-ban, or annihilation. 4. The appearance, at distant periods, of beings, who obtain deification and subsequent annihilation. 5. The obtaining of merit. Of the first four of these enough has been already said. The last is more deserving of notice, embracing as it does the whole system of morals.

"Merit consists in avoiding sins and performing virtues, and the degree of it is the sole hope of the Boodhist. The sins which are to be avoided are described in a moral code, consisting of five principal and positive laws:—1. Thou shalt not kill. 2. Thou shalt not steal. 3. Thou shalt not commit adultery. 4. Thou shalt not lie. 5. Thou shalt not drink any intoxicating liquor. These are explained and branched out, so as to include all sins of the same kind, under each head. The first of these laws is extended to all killing, even that of animals for food. The very religious will not kill vermin. War and capital punishments are considered forbidden by the first law.

"Sins are divided into three classes:—1. Those of the body—such as killing, theft, &c. 2. Those of the tongue—as falsehood, discord, harsh language, idle talk, &c. 3. Those of the mind—as pride, covetousness, envy heretical thoughts, adoring false gods, &c. The more

books pourtray strongly the evils of pride, anger, covetousness, and inordinate appetites. Men are urged to avoid excessive perfumes, ornaments, laughter, vain joy, strong drink, smoking opium, wandering about the streets in the night, excessive fondness for amusements, frequenting bad company, and idleness. Those who aspire to nic-ban are cautioned to abhor sorcery, not to credit dreams, nor be angry when abused nor elated when approved, not to flatter benefactors, nor to indulge in scorn or biting jests, and most carefully to avoid enkindling strife.

"The states of the mind are resolved into three classes:—1. When we are pleased in the possession of agreeable things. 2. When we are grieved and distressed by evil things. 3. When neither do good things gratify us, nor evil things distress. The last is the best state, and in it a man is rapidly preparing for nic-ban. In this there is no small resemblance to the doctrine of the Stoics, and some approach to the Christian doctrine of weanedness from the world. Some of their books abound in good comparisons, such as, that he who runs into sinful enjoyments is like a butterfly who flutters round a candle till it falls in; or one who, by licking honey from a knife, cuts his tongue with the edge. There is scarcely a prohibition of the Bedagat which is not sanctioned by our Holy Scriptures, and the arguments appended to them are often just and forcible.

"Merit is of three kinds:—1. *Theela*, or the observance of all the prohibitions and precepts, and all the duties fairly deducible from them; such as beneficence, gentleness, integrity, lenity, forbearance, condescension, veneration for parents, love to mankind, &c. &c. 2. *Dana*, or giving alms and offerings. This includes feeding priests; building kyoungs, pagodas, and zayats; placing bells at pagodas; making public roads, tanks, and wells; planting trees for shade or fruit; keeping pots of cool water by the way-side for the use of travellers; feeding criminals, birds, animals, &c. 3. *Bawana*, or repeating prayers, and reading religious books.

"Alms-deeds are meritorious according to the objects on which they are bestowed, and proportioned to the following scale:—1. Animals. 2. Common labourers, fishermen, &c. 3. Merchants and the upper classes, when in necessity. 4. Priests. For alms of the first class, the rewards are long life, beauty, strength, knowledge and prosperity, during a hundred transmigrations; for those of the second class, the same during a thousand transmigrations; for the third, the same during ten thousand; for the fourth, a vastly greater number, but indefinite, being graduated according to the degree of sanctity the particular priests may possess.

"Many discourses said to have been delivered by Gaudama are given in the Bedagat. In these, the duties of parents, children, husbands, wives, teachers, scholars, masters, slaves, &c., are drawn out and urged in a manner which would do honour to any casuist.

"The following is part of one of these, addressed to a distinguished personage, who sought his instruction how to avoid evil:—

"'Know thou, that to keep from the company of the ignorant, and choose that of learned men; to give honour to whom it is due; to choose a residence proper to our station, and adapted for procuring the common wants of life; and to maintain a prudent carriage, are means to preserve a man from evil doings. The comprehension of all things that are not evil, the exact knowledge of the duties of our station, and the observance of modesty and piety in our speech, are four excellent modes of renouncing wickedness.

"'By ministering a proper support to parents, wife, and family by purity and honesty in every action, by alms-deeds, by observing the divine precepts, and by succouring relations, we may be preserved from evil. By such a freedom from faults, that not even the inferior parts of our nature manifests any affection for them, by abstinence from all intoxicating drink, by the continual practice of works of piety, by showing respectfulness, humility, and sobriety before all, and gratitude to our benefactors; and, finally, by listening often to the preaching of the word of God, we overcome evil inclinations, and keep ourselves far from sin. Docility in receiving the admonitions of good men, frequent visits to priests, spiritual conference on the divine laws, patience, frugality, modesty, the literal observance of the law, keeping before our eyes the four states into which living creatures pass after death, and meditation on the happy repose of nic-ban—these are distinguished rules for preserving man from wickedness.'

"Pagodas are innumerable. In the inhabited parts there is scarcely a mountain peak, bluff bank, or swelling hill, without one of these structures upon it. Those of Pegu and Siam are all formed upon one model, though the cornices and decorations are according to the builder's taste. In general they are entirely solid, having neither door nor window, and contain a deposit of money, or some supposed relic of Gaudama. From the base they narrow rapidly to about mid-way, and then rise with a long spire surmounted with the sacred tee. Some of those around Ava, and especially those of Paghan, are less tapering, and more resembling temples.

"Zayats are not exclusively religious buildings. Some are intended to contain idols, and some are for the accommodation of worshippers and travellers, and for town-halls. The majority contain no idols, and are intended only to afford shelter for worshippers and travellers. Some of these are mere sheds, open on all sides; but in almost all cases they are built in a far more durable and costly manner than dwelling-houses.

"Every village has a zayat, where the stranger may repose or stay for many days, if he please; and many a time I found them a comfortable lodging-place. Like the chultries of Hindostan, they are of unspeakable utility in a country destitute of inns, and where every house has its full complement of inmates. Many zayats, especially near great cities, are truly beautiful, and very costly. The ceilings and pillars are not only elaborately carved, but completely gilded, and the stucco floors rival marble in hardness and polish.

"Worship is not performed collectively, though crowds assemble at the same time on set days. Each one makes his offerings and recites his prayers alone. No priests officiate; no union of voice is attempted. On arriving at the pagoda, or image, the worshipper walks reverently to within a convenient distance, and laying his offering on the ground, sits down behind it, on his knees and heels, and placing the palms of his hands together, raises them to his forehead, and perhaps leans forward till his head touches the ground. This is called the *sheeko*. He then utters his prayers in a low tone, occasionally bowing as before; and having finished, rises and carries forward his gift, laying it somewhere near the idol or pagoda. Some proceed first to one of the great bells which hang near, and strike several times with one of the deer's horns which always lie beneath. When one goes alone, this is seldom omitted. There are four set days in every lunar month on which the people assemble in greater numbers at the pagoda to offer their individual prayers. These days are at the new and full moon, and seven days after each; so that sometimes their Sabbath occurs after seven days and sometimes after eight.

"Boodhist priests are not a caste or hereditary race. Any one may become a priest, and any priest may return to a secular life at pleasure. Thousands, in fact, return every year, without the least reproach. On becoming a priest, a yellow robe is assumed, and celibacy, with numerous mortifications, is enjoined. Their office may be called a sinecure, as they seldom preach or perform any service, except teaching and giving special religious ad

vice. They are of different degrees of rank, and subsist entirely on the contributions of the people. Their number is very great. Ava, with a population of 200,000, has 20,000 priests.


Boodhist Priest.

"In point of moral obligation, and the inculcation of purity of life, Boodhism is infinitely superior to Hindooism. It has no mythology of obscene and ferocious deities, no sanguinary or impure observances, no self-inflicted tortures, no tyrannizing priesthood, no confounding of right and wrong, by making certain iniquities laudable in worship. In its moral code, its descriptions of the purity and peace of the first ages, of the shortening of man's life because of his sins, &c., it seems to have followed genuine traditions.

"At the same time, we must regard Boodhism with unmeasured reprobation, if we compare it, not with other false religions, but with truth. Its entire base is false. It is built, not on love to God, nor even love to man, but on personal merit. It allows evil to be balanced with good, by a scale which reduces sin to the shadow of a trifle. To sheeko to a pagoda, or offer a flower to the idol, or feed the priests, or set a pot of cool water by the wayside, is supposed to cancel a multitude of sins. The building of a kyoung or pagoda will outweigh enormous crimes, and secure prosperity for ages to come. Vice is thus robbed of its terrors, for it can be overbalanced by easy virtues."

LAMAISM.

In Thibet, Tartary, and other parts of central Asia, inhabited by the Mongolian race, Boodhism assumes a different form and name, being more a religion of pure priestcraft and external observance, and including a belief in the continual personal presence of a supreme God. This branch of Boodhism, as it is believed to be, is usually called Lamaism, the word *Lama* literally signifying priest. Like Boodhism, this religion acknowledges no eternal, self-existing being. The idols, to the number of a hundred and eight, are representatives of created beings, who ascended into the rank of gods before the present world was created, on account of their holiness. The chief god is Shigemooni, who appeared in the world for the last time a thousand years before the Christian era, and then instituted Lamaism, with a visible living representative or appearance of himself, called Dalai-Lama, or the Great Lama. The worship of this Grand Lama, therefore, is a principal feature in the system of belief.

It is understood and inculcated, that when the Grand Lama expires in the course of nature, his spirit immediately takes possession of some other body in a supernatural manner, which it is impious to inquire into, and is only comprehended by the attendant priests. In point of fact, the religion which inculcates this absurdity is idol worship under a different name, the idol being a living creature instead of an inanimate object, as in ordinary paganism; and the whole system seems to have been devised in order to support a numerous host of priests and religious establishments.

Dalai-Lama, or the Grand Lama, is at the head of both ecclesiastical and secular affairs in Thibet, which may be considered a theocratical state. The usual residence of the Dalai-Lama is in two monasteries situated in the vicinity of the capital, Lassa, in each of which he dwells alternately. He is surrounded in every direction by a vast number of priests; but no woman is permitted to pass the night in the building where he lodges. This arises, undoubtedly, from the purity which is attributed to him, for he is called the *immaculate*. The natives, as well as a great crowd of foreigners (for all the Mongol tribes in Russia acknowledge him), undertake fatiguing pilgrimages in order to pay their homage to him, and obtain his blessing. He receives them sitting upon a kind of altar upon a large and splendid seat, with his legs crossed. The Tartars, next to the inhabitants of Thibet, pay him the greatest reverence. They come to him from the most distant regions, and the princes, to whom he shows no more respect than to others, submit to the same ceremonies as their people. He salutes no one, never uncovers his head, rises up before no one, and is satisfied with laying his hand upon the head of his worshipper, who believes that he has thereby obtained the pardon of his sins. His worshippers believe that the supreme divinity lives in him, that he knows and sees every thing in the deepest recesses of the heart, and never needs to make inquiry in regard to any thing. If he does this, it is only that unbelievers and the evil-minded may not have cause for complaint. He sometimes distributes, it is said, little balls of consecrated dough, which the Tartars use in many superstitious practices; but it is not true that balls made from his excrement are distributed, preserved in golden boxes, and even mixed with articles of food. His power was once greater than it is now, and he appointed and deposed the khans; but at present he is dependent on the Emperor of China, although the latter, in a religious respect, is subjected to him. Two Chinese mandarins, with a garrison of 1000 Chinese, are maintained in his capital, and, in the palace at Pekin, the Chinese emperor supports a subordinate Lama, who is sent as a nuncio from Thibet.

When the Dalai-Lama dies, it is then necessary to discover where his spirit has chosen to be born anew. In this case all must submit to the opinion of some of the Lamas, who alone are acquainted with the signs by which he may be known, or, rather, who know what child the deceased has appointed for his successor. The worshippers of the Lama are divided, in general, into two sects, known by the titles of the *yellow* and *red caps*. Each sect is under three Lamas; the former is under the Dalai, Teeshoo or Bogao, and Taranaut Lamas; the latter, under the three shammars. The Dalai-Lama is the most distinguished of all, and next to him is the Teeshoo-Lama, who dwells at Teeshoo-Loomboo, ten days' journey from Lassa. The three shammars dwell in separate monasteries, the most distinguished of which is at Tassasudon, the capital of Bootan. Subordinate to them are numerous priests of different ranks, who are held in great respect, who superintend instruction, and some of whom live in a state of celibacy, according to certain rules, similar to those of the Christian monks. At Lassa alone there are 3000 monasteries.

MOHAMMEDISM.

The religion of Mahomet, or Mohammed, and called Mohammedism, partakes of a much more exalted character than any of the mythological superstitions already adverted to, inasmuch as it approaches a pure theism, or a belief in the one true God. This famed religion, which now prevails in Arabia, Egypt, the Moorish states, Turkey, Persia, and is extended in a scattered manner over south-eastern Asia, and numbers 100,000,000 of followers, originated in Arabia at the beginning of the seventh century of the Christian era.

At this period, eastern countries were in a condition to receive a new and vigorously conducted form of religious belief. The scattered branches of the Christian church in Asia and Africa were at variance with each other, and had adopted the wildest heresies and superstitions. They were engaged in perpetual controversies, and torn to pieces by the disputes of the Arians, Sabellians, Nestorians, and Eutychians; whilst the simony the incontinence, and general barbarism and ignorance which were to be found amongst the clergy, caused great scandal to the Christian religion, and introduced uni-

versal profligacy amongst the people. While Christianity, in the manner it was abused by unenlightened followers, was of little avail in civilizing the Asiatics, while the religion of the Jews was sunk into comparative insignificance, and while paganism still flourished in the east, Mohammedism was introduced upon the scene, and in a wonderfully short period of time, gave an entirely new cast to manners and form of belief. Arabia being the country in which this new religion was first promulgated, it is considered desirable to mention the nature of the religion which the people previously professed and now abandoned.

"The ancient Arabs are supposed to have been what are termed pure theists; that is, they are supposed to have believed in and worshipped one sole, omnipotent, and everlasting God. Historians, however, have seldom correctly appreciated the meaning of these magnificent expressions in the mouth of a savage. In his mind such language is connected with ideas and feelings far other than those which a civilized man would express by it. These splendid epithets are the mere expressions of flattery and fear. The Deity, now addressed, and whose favour is the object of present desire, is for the time the sole object of adoration. The very same savage, who believes in a host of gods, will address each of them by the term of THE ONE. If among many deities one is thought more powerful than the rest, he will be the oftenest addressed, the oftenest soothed by flattery. No epithet is so flattering as that which asserts his single existence. It exalts him above all beings, and leaves him without a rival. No epithet, therefore, will be so frequently employed. Being the most constantly adored, this more powerful divinity will have this epithet expressive of his sole existence so frequently connected with his name, that it will at length be regularly attached to, and form part of, that name. This was precisely the case with the Arabian objects of worship. It is strange that, when complete evidence of this fact exists, really intelligent and circumspect historians should have believed in the pure theism of the Arabians. Sale, like many others, was deceived by pompous expressions:—'That they acknowledge one supreme God, appears (to omit other proof) from their usual form of addressing themselves to him, which was this:—"I dedicate myself to thy service, O God!—I dedicate myself to thy service, O God! Thou hast no companion, except thy companion of whom thou art absolute master, and of whatever is his."' In the very next passage, however, Sale adds, 'They offered sacrifices and other offerings to idols, as well as to God, who was also often put off with the least portion, as Mohammed upbraids them.' Their scheme of divine government was simple, and like most others formed in the same state of civilization. One god was supposed to be the supreme ruler; and subject to his sway was a vast multitude of inferior deities. 'The Arabs acknowledged one supreme God, the creator and lord of the universe, whom they called Allah Taala, the most high god; and their other deities, who were subordinate to him, they called simply Al Ilahat, that is, goddesses.'* Idols were set up and worshipped; every field, every rivulet, had its divinities. The fixed stars and planets were also exalted into gods, and as such received adoration. Heaven, moreover, was peopled with angels, who, with the wooden, stone, and clay idols on earth, were regularly worshipped. How the Arabians can be supposed believers in a single godhead, under such circumstances, appears extraordinary.

"The manner in which these various divinities were rendered propitious, at once marks that no very exalted conception of a divinity existed in the minds of these barbarians. Fasts, pilgrimages, sacrifices, long and unmeaning prayers, were the means employed to obtain the divine favour.

"'They are obliged to pray three times a-day (some say seven times a-day): the first, half an hour or less before sunrise, ordering it so, that they may, just as the sun rises, finish eight adorations, each containing three prostrations; the second prayer they end at noon, when the sun begins to decline, in saying which they perform five such adorations as the former; and the same they do the third time, ending just as the sun sets. They fast three times a year: the first thirty days, the next nine days, and the last seven. They offer many sacrifices, but eat no part thereof, but burn them all. They abstain from beans, garlic, and some other pulse and vegetables.'*

"'The same rites which are now accomplished by the faithful Mussulman, were invented and practised by the superstition of the idolaters. At an awful distance they cast away their garments; seven times, with hasty steps, they encircled the Caaba, and kissed the black stone; seven times they visited and adored the adjacent mountains; seven times they threw stones into the valley of Mina, and the pilgrimage was achieved as at the present hour, by a sacrifice of sheep and camels, and the burial of their hair and nails in the consecrated ground.'"† The Arabians had many other superstitious practices; they held their women in a degraded condition; and, though refined in some points of manners, they had no written law, were governed despotically by chiefs, and were really barbarians and idolaters. It was the debased religion of this people which Mohammed designed to improve, and we have now to see who this singularly bold and ingenious man was, and how he carried his plans into execution.

Mohammed was born at Mecca, the capital city of Arabia Felix, A.D. 569, during the reign of Noosheervan, surnamed the Just, King of Persia. He was of the family of Haschem, and of the tribe of the Koreish, the noblest in Arabia. His father Abdallah was a younger son of Abdalmotalleb, and dying very young, and in his father's lifetime, left his widow and infant son in very mean circumstances, his whole substance consisting but of five camels and one Ethiopian female slave. Abdalmotalleb was therefore obliged to take charge of his grandchild Mohammed, which he not only did during his life, but at his death enjoined his eldest son, Abu Taleb, who was brother to Abdallah by the same mother, to provide for him for the future. This was very affectionately performed by Abu Taleb, who instructed him in the business of a merchant, which he followed; and to that end he took young Mohammed into Syria when he was but thirteen years old, and afterwards recommended him to Khadijah, a noble and rich widow, for her factor, in whose service he behaved so well, that, by making him her husband, she soon raised him to an equality with the richest in Mecca.

It was after he began, by this advantageous match, to live at his ease, that he formed the scheme of establishing a new religion, or, as he expressed it, of replanting the only true and ancient one professed by Adam, Noah, Abraham, Moses, Jesus, and all the prophets, by destroying the gross idolatry into which the generality of his countrymen had fallen, and weeding out the corruptions and superstitions which the latter Jews and Christians had, as he thought, introduced into their religion, and reducing it to its original purity, which consisted chiefly in the worship of one only God. He thereupon began to affect solitude, usually retiring for a month in the year to a cave in Mount Hara, near Mecca. He had indisputably a very piercing and sagacious intellect, and was thoroughly versed in all the arts of insinuation. The eastern historians describe him to have been a man of an excellent judgment and a happy memory; and these

* Sale, Pre. Disc., p. 20.

* Sale, Pre. Disc., p. 19.
† Life of Mahomet—Library of Useful Knowledge.

natural parts were improved by a great experience and knowledge of mankind, and the observations he had made in his travels. He is represented as a man of few words, of an equal, cheerful temper, pleasant and familiar in conversation, of inoffensive behaviour towards his friends and acquaintances, and of great condescension towards his inferiors; to all which were joined a comely agreeable person, and a polite address—qualities of no small service in prepossessing those in his favour whom he attempted to persuade.

"When the prophet was about four years old," says Mahmut the Arabian,* "accompanying the sons of his nurse into the field, the blessed child retired into a cave, at the foot of the mountain Uriel, to pray, when the Archangel Gabriel appeared to him, and said, *Bismillar rahmanir rahimi;* that is, 'In the name of God, compassionate and merciful, O child greatly beloved, I am sent to displant from thy heart the root of evil; for thy ejaculations made the gates of Paradise to fly open!' The young resigned one said, 'The will of thy Lord and mine be done.' Then the angel opened his breast with a razor of adamant, and, taking out his heart, squeezed from it the black contagion which was derived from Adam; and having put the child's heart in its place again, he blessed him, and retired to the invisibles. From that time the young favourite of Heaven grew up and prospered in all things, having the smiles of God and man. He was under the tuition of his uncle Abu Taleb, who, discerning the mark of an immense soul in his young nephew, was more solicitous for his welfare than if he had been his son. His fortune being low in the world, he had no other way to provide for his illustrious charge than by placing him as a factor to Khadijah, a widow of the same tribe with Mohammed, which was the noblest among the Arabians."

Mohammed's marriage with Khadijah took place when they were respectively twenty-five years of age; and it was not till twelve years after this marriage that he began to fabricate his imposture, in the cave of Mount Hara, about three miles from Mecca, to which he usually retired during the month of Ramazan, being the time of Lent. At length, A. D. 609, when he was fully forty years old, he disclosed his prophetic mission at first only to his own wife Khadijah. He told her that the Angel Gabriel had appeared to him in glory, and declared that God had commissioned him as an apostle to reform the world; *that he then delivered to him the Koran for a divine law*, which should complete all antecedent revelations. Khadijah gained for her husband an important proselyte in her uncle Waraka, a Christian, who was well read in the Old and New Testaments. He pronounced Mohammed *"to be the great prophet foretold by Moses the son of Amram."* It is much more probable that Waraka was the assistant of Mohammed in composing the Koran than Sergius the monk, or any other person.

The next proselyte was Abubeker, a rich and respectable inhabitant of Mecca; and his example being followed by many others, Mohammed ventured on a bolder demonstration of his mission. At a numerous assemblage of the Koreishites, at a public entertainment to which he had invited them, he demanded who would become his vizier, or prime minister, assuring them that both happiness in this world and in that to come would accrue to his followers. The guests remained silent in surprise, when Ali, the son of Abu Taleb, a boy about fourteen years of age, started up enthusiastically, and said, "I will be thy vizier, oh Prophet of God! I will break the teeth, pluck out the eyes, rip up the belly, cut off the legs of thine enemies." The joy and approval testified by Mohammed to the zeal of his youthful disciple, was an apt and early specimen what manner of spirit he and his deputy were of. The hostile proceedings and denunciations of the prophet against their idolatry, at length aroused the enmity of the Koreishites; but their threats were despised by him, and, in reply to the prudent remonstrances of his uncle Abu Taleb, he exclaimed, "Though the Koreishites should arm against me the sun and the moon (alluding to the divinities whom they ignorantly worshipped), the one on my right hand, and the other on my left, I would not be shaken from my resolution." He, however, retired for a while to a castle in Mount Safa, and his followers were banished from the city of Mecca. After this persecution, which lasted five years, in the tenth year of his mission (A. D. 618), he sustained a serious loss in the death of his uncle Abu Taleb: and this was followed a short time after by the death of his affectionate wife Khadijah, who had so generously made his fortune. On account of these misfortunes, this year was called the Year of Mourning. Instead of sinking under these adversities, however, upon being violently urged by the Koreishites, who still derided his pretensions, to exhibit some miracle, Mohammed ventured, in the twelfth year of his mission, to publish the revelation of his night visit or journey to the seven heavens.

This event formed a striking epoch in his mission, and displayed in the strongest manner the dexterity as well as boldness of his measures. The question so forcibly put to him, of establishing his mission by miracles, is therein artfully parried, and replied to by an appeal to the wonders wrought by Moses, which did not cause the reformation of Pharaoh, and to those of Jesus, which failed with the Jews; he also incidentally remarked, that miracles were designed rather to strike terror and to punish than to convince.

This famous journey is thus described by Mohammed: While he was in the Caaba, or sacred square building at Mecca, reclining on the sacred stone, the Angel Gabriel came to him; he opened his breast, took out his heart, and washed it in a golden basin full of the water of *faith*, and then restored it to its place. The angel had seventy pairs of wings, and had the beast Alborak with him, on which the prophets used to ride: it was white and partly horse, ass, and mule, or a middle between the two last, and went as fast as the lightning, which the name Alborak, in Arabic, signifies. When he was brought to Jerusalem by the angel, all the prophets met him, and owned his superiority. He ascended to heaven with the angel, on a ladder of divine light, and left the beast Alborak at Jerusalem till he descended again. He went through seven heavens before he came to the throne of God, which was in the last one, and Gabriel left him at the entrance of it, and waited till he returned from conversing with God, who gave him the offer to be next himself; but he rather chose to descend again to the earth to propagate his religion. His heavens were all 500 years' journey distant from one another. One was of silver, another of gold, another of emeralds, &c., and the last of light. He met some one of the patriarchs or prophets in each of them. In the first he met and discoursed with Adam; in the second, with John the Baptist and Jesus; in the third, with the patriarch Joseph; in the fourth, with Edris or Enoch; in the fifth, with Aaron; in the sixth, with Moses; in the seventh, with Abraham. Thence he was carried up to *Sedrat*, the lotus tree, whence were the sources of the four rivers of Paradise. He saw angels in the likenesses of all creatures in these heavens. He saw a great bull bearing the earth on his horns, and when he shook his head there was an earthquake. There was also a cock, which stood on one heaven, and his head reached another; his voice was heard through heaven and earth, and set all the cocks on earth a-crowing. He saw an angel of such stature that there was 70,000 days' journey between his eyes. The proportion of a man's height to the distance between his eyes is as seventy-two to one so that his

* Turkish Spy, vol. v. p. 190.

stature must then have been 14,000 years' journey, four times the height of all his heavens together, in which he was quite out of his mathematics. In the seventh heaven, where God and Christ were, was an angel with 70,000 heads; and in each head 70,000 tongues, with which he praised God. Gabriel accompanied him down from heaven to Jerusalem, and from thence conveyed him, with the beast Alborak, to Mecca; and all this was done in the tenth part of a night. In the conclusion of this extraordinary fabrication, he skilfully adds, that when he was enjoined to repeat fifty prayers each day, he entreated for his nation, and they were finally reduced at his intercession to five. To finish the wonder, he was returned back to the Caaba ere the crier called him to prayers; and "thus," concluded Mohammed, "did I bring with me the prescribed number of prayers, and lessened the burden for my nation."

This story seemed so absurd and incredible, that several of his followers left him on account of it; and it had probably ruined the whole design, had not Abubeker vouched for his veracity, and declared that, if Mohammed affirmed it to be true, he verily believed the whole; which happy incident not only retrieved the prophet's credit, but increased it to such a degree, that he was secure of being able to make his disciples swallow whatever he pleased to impose on them for the future. "And I am apt to think," says Sale, "this fiction, notwithstanding its extravagance, was one of the most artful contrivances Mohammed ever put in practice, and what chiefly contributed to the raising of his reputation to that great height to which it afterwards attained."

In this memorable year twelve citizens of Medina swore allegiance and obedience to the Prophet, whence they were styled, by way of dignity, *Al Ansar*, that is, "The Defenders;" and the year A. D. 620 was denominated the "accepted year." On Mount Aksba, near Mecca, seventy-three proselytes were soon after added to their number, and swore to defend the prophet from all insult, as they defended their own wives and children. "If," said they to the apostle of God, "we be slain in thy cause, what shall be our reward?" He answered, "Paradise." Then, said they, "Stretch forth thy right hand," and he did so; then they took the oath of obedience, promising rather to die than be perjured. He now established twelve apostles of Islamism, which was the name he gave to his religion, himself being the prime instructor and chief of all the true believers; and he then sent away the Ansars, his followers, and his family, to Medina, for security, and remained behind at Mecca, attended only by Abubeker and his son-in-law Ali.

By the protection which his uncle Abu Taleb had extended to Mohammed, he had been preserved thus far from his enemies; but the charge and dignity of the priest and guardian of the Caaba, having now, by the death of Abu Taleb, become the post of a member of the family of Ommiyah, a declared enemy to the family of Haschem, to which Mohammed belonged, the Koreishites, irritated and alarmed at the progress making by the new doctrine at Medina, resolved to destroy its author and chief support. This conspiracy was scarce formed, when, by some means or other, it came to Mohammed's knowledge, and he gave out that it was revealed to him by the Angel Gabriel, who had now ordered him to retire to Medina. Whereupon, to amuse his enemies, he directed Ali to lie down in his place, and wrap himself in his green cloak, which he did; and Mohammed escaped miraculously, as they pretend, to Abubeker's house, unperceived by the conspirators, who had already assembled at the prophet's door. They, in the mean time, looking through the crevice, and seeing Ali, whom they took to be Mohammed himself, asleep, continued watching there till morning, when Ali rose, and they found themselves deceived.

In the recesses of a cave near Mecca, Mohammed and Abubeker eluded for three days the pursuit of their enemies. "There are only two of us," said the apprehensive disciple, when he expected the pursuers to penetrate their retreat. "There is a third, even God himself," said the intrepid chief; "he will defend us." According to tradition, Mohammed, afterwards asserted that a miracle was here wrought in his behalf; for that his enemies, approaching the cave, found that its entrance was covered by spiders' webs hanging from the trees, which convinced them that no person had entered it for a long time. After a perilous journey, Mohammed entered Medina in triumph, being enthusiastically received by the Ansars, who disputed for the honour of entertaining the prophet, and took hold of the bridle of his camel. Mohammed then desired them to let her take her own way, for she was a stubborn beast; which she took, accordingly, and stopped at the stable of two rich orphans, Sahali and Sohaili, where the prophet dismounted. This spot he purchased from the orphans, after refusing their offer to bestow it upon him, and Abubeker paid the money. He erected thereon a mosque, and a habitation for himself, on which he laboured with his own hands. Medina henceforth received the august title of *Medinat al Nabi*, or the "City of the Prophet."

The Mohammedan era, called the Hejira, takes its commencement from the date of Mohammed's flight from Mecca to Medina. The generality of writers place this epoch on Friday, the 16th of July, A. D. 622. It is this event which has rendered Friday the solemn day of the week for his followers; this choice also agreeing with the customs of the Arabians, who held their assemblies usually on the Fridays. The word *Hejira* is derived from the Arabic verb *Hajara, to abandon one's native country, to emigrate on account of persecution*; which comes from the Hebrew *Hagar, the stranger* or *emigrant*, the name of Ishmael's mother.

It was from this period that Mohammed, having fully ascertained the hate of his enemies and the extent of his own power, proceeded to lay aside the arts of persuasion and patient endurance, whereby he had hitherto sought to propagate his tenets; and, elated by the devotion of his disciples and his reception at Medina, he framed henceforth the revelations of the Koran in a tone which proclaimed him a persecutor, and empowered his followers to make war against all opposers. The successful battle of Beder followed soon after; and he then made known those doctrines which have rendered the arms of the Mussulmans so formidable, namely, "that no one can escape his destiny; inasmuch as the man whose days are not complete will escape unhurt from a shower of arrows, when he whose fatal term has arrived cannot escape death by any precaution whatsoever." The second incitative is that which the present occasion furnished him with:—"The sword," exclaimed the prophet, "is the key of heaven and of hell; *a drop of blood shed in the cause of God, a night spent under arms*, is of more avail than two months of fasting and prayer. Whosoever falls in battle, his sins are forgiven: at the day of judgment, his wounds shall be resplendent as vermilion and odoriferous as musk; the loss of his limbs shall be replaced by the wings of angels and of cherubim."

This victory, the first of Mohammed's battles, was gained, in the second year of the Hejira, over the idolatrous Meccans, headed by Abu Sofian, in the valley of Beder, which is situated near the sea, between Mecca and Medina. Mohammed's forces consisted of no more than 319 men, and the enemy's army of near 1000; notwithstanding which odds, he put them to flight, having killed seventy of the principal Koreish, and taken as many prisoners, with the loss of only fourteen of his own men. This first victory, although it may seem no very considerable action, was yet of great advantage to him, and

the foundation of all his future power and success; for which reason it is very famous in Mohammedan history, and is frequently vaunted of in the Koran as an effect of the divine assistance, through the miraculous interposition of the Angel Gabriel. The gaining of the battle was, however, wholly attributable to the extraordinary stratagem of Mohammed, by his expedient, at the critical moment, of scattering a handful of dust against his enemies, at the same time exclaiming, "Let their faces be confounded!"—which action so invigorated his fainting followers, that they charged and overthrew their foes. Mohammed captured the whole caravan, which consisted of 1000 camels, richly laden, from Syria; and this afforded him the means of rewarding his followers, and inciting them to further exertion by the allurements of wealth and the hope of plunder.

Some reckon as many as twenty-seven expeditions wherein Mohammed was personally present, in nine of which he gave battle; besides several other expeditions, undertaken by his orders, in which he was not present. His forces he maintained partly by the contributions of his followers for this purpose, which he called by the name of *zacat* or alms, and the paying of which he very artfully made one main article of his religion; and partly by ordering a fifth part of the plunder to be brought into the public treasury for that purpose, in which matter he likewise pretended to act by the divine direction.

In a few years, by the success of his arms, he considerably raised his prophetic character and power. In the sixth year of the Hejira, he set out with 1400 men to visit the temple of Mecca, not with any intention of committing hostilities, but in a peaceable manner. However, when he came to Al Hodeibiya, which is situated partly within and partly without the sacred territory, the Koreish sent to let him know that they would not permit him to enter Mecca unless he forced his way; whereupon he called his troops about him, and they all took a solemn oath of fealty or homage to him, and he resolved to attack the city; but those of Mecca, sending Arwa Ebn Masud, prince of the tribe of Thakif, as their ambassador, to desire peace, a truce was concluded between them for ten years, by which any person was allowed to enter into league either with Mohammed or with the Koreish, as he thought fit.

Having subdued the chief part of the pagan tribes, and by his relentless severity exterminated the Jewish classes who dwelt peaceably in Arabia, in the seventh year of the Hejira (A. D. 628), he assumed the state of a sovereign, and sent embassies to the neighbouring monarchs, exhorting them to embrace Islamism.

In the eighth year of the Hejira, a quarrel, real or feigned, gave him the opportunity of possessing himself of Mecca, and of the sacred square edifice called the Caaba. Mohammed appearing suddenly at their gates with 10,000 men, before the troops of Mecca had even been apprized of his departure from Medina, they had no choice left but an immediate surrender or destruction. Thus pressed, and menaced with instant death, the Koreish submitted to the superior power of Mohammed. Their final submission to him, and their acceptance of his faith, were ratified subsequently on the hill El Safa. Having visited the holy building of the Caaba, and broken in pieces the idols wherewith it was encircled, Mohammed went in procession seven times round the building, and touched respectfully the black stone which was held sacred by the Arabs; then entering the edifice, he repeated the formulary, "*God is great.*" Afterwards he went to the well Zemzem—which is believed by them to be the same that the angel showed to Hagar—drank of the water, and performed the required ablution. Artfully blending attention to exterior observances with zeal, and pursuing a mixed system of mercy and rigour, he subdued the hearts of his high-minded countrymen, and soon superadded to his claims of power he more imposing and indissoluble bonds of superstitious reverence and awe. The capture of Mecca, and the submission of the powerful race of the Koreish, was soon followed by the conversion to Islamism of most of the remoter pagan tribes, until all Arabia bowed the neck beneath his yoke.

Mohammed, having thus become master of all Arabia, made great preparations for the conquest of Syria; but this vast enterprise was reserved for his successors. He gradually, however, paved the way for their successes, and brought the celebrated region of Arabia into one complete and powerful union. He established the law which still obtains in all the Mussulman states, of imposing a personal tax on such as do not embrace Islamism. By this custom, still subsisting among all the sovereigns who acknowledge the Koran, every reputed infidel pays a *kharaj*, or capitation-tax, over and above the imposts which he supports equally with the rest of the subjects. He absolutely prohibited all idolaters from making the pilgrimage to Mecca, or any foreigner from entering the Caaba, under pain of death. These were strokes of profound policy. He retained the pilgrimage to Mecca, which had been of ancient standing among the descendants of Abraham and Ishmael. Though he destroyed the images used at Mecca as objects of idolatrous worship, he carefully retained the holy relics of the black stone and the supposed impression of Abraham's foot. The black stone had been immemorially venerated there; the angels, it was said, had brought it *white* to the Caaba, and the sins of mankind had transformed it to *black*. Hence, in allusion to this stone, the Orientals use the compliments, "May God whiten thy face;" "May the shah make thy face white," &c.

These practices no less forwarded the progress of Islamism than did the sword of Mohammed. Everywhere the petty Arabian tribes overthrew their idols and submitted themselves to the new faith. Thus was Mohammedism established, and idolatry rooted out, even in Mohammed's lifetime, throughout all Arabia; and the Arabs, being then united in one faith and under one prince, found themselves in a condition for making those conquests which extended the Mohammedan faith over so great a part of the world.

In the tenth year of the Hejira (A. D. 631), Mohammed set forth on a solemn and pompous embassy to Mecca, accompanied by all his wives, and by at least 90,000 pilgrims. He sacrificed with his own hands sixty-three victims, and liberated sixty-three slaves, in thanksgiving for each year of his life; he shaved his head, and scattered the hair among the multitude, who eagerly seized portions of it as sacred relics. He closed the solemnity with the following apostrophe, which, as if pronounced from heaven, concludes the Koran:—"Henceforth, wretched and miserable shall they be who deny your religion. Fear not them, but fear me; this day I have perfected your religion, and completed my grace toward you. I have willed that Islamism be your religion." He established the lunar movable year, still in use with the Mohammedans; and, finally, as supreme Pontiff, or Imam, dismissed the people with a farewell, the last, as he declared, that he should give them; whence this pilgrimage derived its name of the Farewell.

Mohammed, having returned to Medina, now drew near the close of his extraordinary and fortunate career. His health had been for three years on the decline; but he had neither relaxed his duties nor his labours. Being at length affected with a mortal malady, he was conveyed to the house of his favourite wife, Ayesha, where he expired, in the eleventh year of the Hejira (A. D. 632), in the sixty-first year of his age. Of all his wives, the first alone bore him any children, of whom only his daughter Fatima, wife of Ali, survived him.

Having thus presented a sketch of the life of this re-

markable man, we proceed to a notice of the religion which he founded. As already mentioned, Mohammed must be viewed chiefly in the light of an improver on the old modes of belief and practice of the Arabians; and his merit (if we may so call it) in this respect appears to have been the combining of a variety of religious opinions into one form of faith, superadding an implicit belief in his own prophetical character, and enunciating the whole of his code in the writings of the Koran. At the period of his death, he bore the character both of a divinely appointed vicegerent and of a secular prince, the latter being gained by his conquests; and his successors claimed the same double qualification. After the prophet's decease, the election of a successor occasioned considerable excitement, his father-in-law Abubeker, and his son-in-law and cousin Ali, each claiming the office of caliph. Abubeker was finally successful in the competition, and he, as is known to the readers of history, was succeeded by the ferocious Omar. Ali became the fourth caliph, but he was summarily cut off by poison; and from the long contests which afterwards occurred, it is difficult to say in what line the caliphate was ultimately settled.

The Koran, or prescribed record of the Mohammedan faith, consists of 114 chapters, each with a distinct title, but varying in length from a few sentences to several pages. No continuous subject can be said to run through the work, each chapter being in the form either of a separate revelation, or treating of a peculiar matter in faith, morals, or law. Among the titles to the various chapters, we find the following:—The Cow; the Family of Imran; Women; the Spoils; Jonas; Joseph; Abraham; The Night Journey; The Cave; The Assembly; The News; Divorce; The Fig; The Resurrection, &c. The whole is a singular jumble of highly poetical passages, narratives characterized by great simplicity and beauty of style, garbled extracts from the Old Testament, and pious exclamations. The praise of the Almighty is a prevailing theme in all parts of the work, along with a deep inculcation of the principle that Mohammed is the greatest of all prophets who ever appeared on earth. The work certainly contains much that is excellent as respects moral admonition, but also a great deal that is incomprehensible and ludicrous. Mohammed did not live to complete his Koran in the shape we now see it. With the assistance, unquestionably, of a person versant in the Jewish Scriptures, he from time to time, as was suggested by passing circumstances, composed his fragments, which he declared to have been revealed to him from God by the Angel Gabriel; and these having been collected by his followers, were, by succeeding caliphs, formed into a volume entitled *Al Koran* (pronounced *Kooran*), or The Book.

Whatever we may advance against the authority of the Koran, it is certain that it has been received by Mohammedans with a degree of reverence rarely witnessed among Christians towards the Holy Scriptures. In it they view the whole code of religious belief, civil law, and moral obligation. The belief which they generally profess, as drawn from the Koran, consists in the following leading points:—Religion is divided into two branches—faith and practice. Faith includes belief in God, in his angels, his revelations in the Koran, his prophets, the resurrection and day of judgment, and God's absolute decrees. Practice includes prayer, comprehending under this head the purifications necessary before prayer, almsgiving, fastings, and the pilgrimage to Mecca. The religion, as a whole, is called the religion of *Islam*, or *Islamism*. "The word *islam* signifies an entire submission to the will of God, and thence the attaining of security, peace, and salvation. This act is performed, and these blessings are obtained, according to the doctrine of the Koran, by acknowledging the unity of God and the apostleship of Mohammed. Every man who makes this profession (*aslama*) is a *Moslem*, that is, one who has entirely given himself up to the will of God, and is, on that account, in a state of salvation (*salam*). As it happens that *Muslimani*, the dual of *Muslim*, is commonly substituted for the singular by the Persians and Turks, the words *Mussulman* or *Mussulmans*, has in those, as well as in European languages, now nearly superseded the shorter and more correct term."—(*Encyclopedia Americana.*)

The notions of God and his attributes appear from the Koran to be just, and favourable to devotion. The belief in angels is, however, mingled with many singular fancies. They are believed to have been created of fire, to have pure and subtle bodies requiring no support, and that there is no distinction of sexes among them. The angels are supposed to have various forms and offices assigned to them; some adoring God, singing praises to him, or interceding for mankind, while others are engaged in writing down the actions of men, carrying the throne of God, and performing other services. The Mohammedans also believe that there are two guardian angels appointed to attend upon every human being, who observe and write down his actions, and who are changed every day.

There are four angels whom the Mohammedans believe to be more in the favour of God than any of the others. These are Gabriel, who is sometimes called the Holy Spirit and the Angel of Revelations, from his being employed in writing down the decrees of God; Michael, the friend and protector of the Jews; Azrael, the angel of death; and Israsil, who is to sound the trumpet at the resurrection. The devil, called in the Koran Eblis, is supposed to have been one of those favoured angels, but he fell because he refused to worship Adam, with the other angels at his creation. In the eighteenth chapter of the Koran, however, he is said to have been one of the genii, a species of beings whom the Mohammedans believe to be intermediate between angels and devils. The genii are said to have been created, like the angels, of fire, free from smoke; but, unlike the angels, they eat and drink, propagate their species, and are subject to death. Some are supposed to be good, and others bad. In the seventy-second chapter of the Koran, a company of the genii are described as believing in the doctrine of Mohammed on hearing him read it.

With respect to the belief in prophets, the Koran inculcates the doctrine that God has at various times given revelations of his will to several prophets, whose books originally amounted to one hundred and four. Of these, ten were given to Adam, fifty to Seth, thirty to Enoch, ten to Abraham, and the other four to Moses, David, Jesus, and Mohammed. All these, except the four last, they believe to be lost; and that, after Mohammed, no other revelation may be expected. It appears that they have some prayers of Moses, Jonas, and others, a book called the Psalms, which consists of extracts from our version mixed up with other matter, and a history of Christ said to be written by St. Barnabas. In this book, Christ is made to predict the coming of Mohammed under the title of "Famous," that being the signification of his name in Arabic. According to tradition, there have been from time to time no fewer than 224,000 prophets sent into the world; and of these, 313 were apostles, charged with commissions to reclaim mankind from the infidelity into which they had fallen. Six of them, namely, Adam, Noah, Abraham, Moses, Jesus, and Mohammed, were sent especially to promulgate new laws or dispensations. The Mohammedans believe some of these apostles to have been superior to the others; to the last six, for instance, they give the first place. They believe them to have been free from great sins, although not perfectly pure, and that they all professed the same religion. In this list of prophets they introduce many whose names are mentioned in scripture as patriarchs, such as Adam, Seth, Lot, &c., and also many others who

are not mentioned in the sacred writings. But of all the prophets of God, the Koran enforces the leading doctrine that Mohammed is the greatest, and that his mission is to be believed in under the most severe penalties. "God will render of none effect the works of those who believe not, and who turn away men from the way of God; but as to those who believe and work righteousness, and believe in the revelation which hath been sent down unto Mohammed (for it is the truth from their Lord), he will expiate their evil deeds from them, and will dispose their heart aright. When ye encounter the unbelievers, strike off their heads, until ye have made a great slaughter among them; and bind them in bonds; and either give them a free dismission afterwards, or exact a ransom, until the warriors shall have laid down their arms. This shall ye do."—Chap. xlvii. From numerous passages of this kind, the Mohammedans have framed the brief enunciation of their belief—"There is no God but God, and Mohammed is his prophet," a saying which is ever in their mouths, and may be called their popular creed.

Regarding the resurrection, the Mohammedans believe that, when a dead person is laid in the grave, he is received by an angel, who gives him notice of the coming of the two *Examiners*. These are two black angels of a terrible appearance, named Mouker and Nakir. They order the dead person to sit upright, and examine him concerning his faith in the unity of God and the mission of Mohammed. If he answer correctly, his body is allowed to lie at rest, and is refreshed with the air of paradise; but if he appeared skeptical they beat him on the temples with iron rods, till he cries with anguish so loud as to be heard by all except men and genii. As to where the soul dwells after death, the Mohammedans seem to have a variety of opinions, which need not to be particularized. Mohammedans are also divided as to the nature of the resurrection, some believing that it will be merely spiritual, others that the body only will be raised; but it is believed that all who have ever lived will appear for judgment. It is likewise believed that the irrational animals will be judged at the resurrection, and the weak animals will take vengeance on the strong until satisfaction is given to the injured. The Koran enjoins kindness to all animals whatsoever, although it pronounces some to be unclean; and it is allowed that the conduct of Mohammedans in this respect far excels that of the generality of Christians.

It is supposed by the more orthodox Mohammedans, that the books wherein the bad actions of a man are registered will be put into one scale, and the good into another, and according as these preponderate sentence will be given. After this will follow the satisfaction which every one takes of his fellow, or the retaliation made by them for the injuries they have received. The manner of giving this satisfaction will be to take away from one man a portion of his good works and give it to one whom he has injured. "Which being done," says Mr. Sale, "if the angels say, Lord, we have given to every one his due, and there remaineth of this person's good works so much as equalleth the weight of an ant, God will of his mercy cause it to be doubled to him, that he may be admitted into paradise. If, on the contrary, his good works be exhausted, and there still be some to receive satisfaction from him, God will order an equal amount of their sins to be heaped upon him, that he may be punished in their stead. The trials being over and the assembly dissolved, the Mohammedans hold that those who are to be admitted into paradise will take the right-hand way, and those who are destined for hell-fire the left; but both of them must first pass the bridge called in Arabic *al Sirat*, which they say is laid over the midst of hell, and describe to be finer than a hair and sharper than the edge of a sword."

The Mohammedans believe hell to be divided into seven apartments designed for the reception of different degrees of sinners. The first is designed to receive the wicked Mohammedans, the second for the Jews, the third for the Christians, and the rest for other sects and unbelievers. Over these will be placed nineteen angels, to whom the condemned will confess the justness of God's sentence, and beg them to intercede with him in their behalf. The punishment of infidels will be continued for ever, but wicked Mohammedans will be released after a certain period of suffering.

Before entering paradise, the righteous will drink of the pond of Mohammed, which is supplied with water from the four rivers of paradise. It is described as a month's journey in compass, and whoever drinks of the water will thirst no more. It is a matter of keen dispute whether paradise is already created, many supposing that it will be different from the paradise in which Adam was placed. The more orthodox opinion, however, is, that it is the same, and that it was created before the world. It is supposed to be situated above the seven heavens, immediately under the throne of God, and is described as a place of great beauty. The trunks of the trees are of gold, one of which, the tree of happiness, will yield all sorts of fruit for the consumption of true believers.

God's absolute decree and predestination of both good and evil, is a doctrine which Mohammed always took occasion to impress upon his followers. He said that God had not only predetermined the adverse or prosperous fortune of every person in the world, but also his faith or infidelity, which fate it is impossible by any foresight to avoid. By this doctrine Mohammed taught his followers to have the greatest contempt for danger, which was of material service to him in the propagation of his creed.

Of the four points of religious practice required by the Koran, prayer is the first. Mohammed included under this act purifications of the body, by total immersion at certain periods, and by washing the face, hands, and feet, at others. To make his followers punctual in the observance of these purifications, Mohammed declared that the practice of religion is founded on cleanliness, without which prayer would not be heard by God. A Mohammedan is obliged to pray five times in the twenty-four hours, at stated periods—before sunrise in the morning, when noon is past, in the afternoon before sunset, in the evening after sunset, and before the first watch of the night. Public notice is given of these periods by the *muezzins*, or criers, and every Mohammedan prepares himself for prayer. This he performs either in the mosque, or any other place, provided it be clean, after a prescribed form, and with a certain number of ejaculations, which he is on no occasion to abridge, unless when on a journey or preparing for battle. It is also necessary that he should kneel in an humble posture, and turn his face towards Mecca, as expressed in the second chapter of the Koran: "Turn, therefore, thy face towards the holy temple of Mecca, and wherever ye be, turn your faces towards that place." The direction of Mecca is pointed out within the mosque by a niche on the outside, by the situation of the doors and the steeple; and tables have been calculated for finding this out when they have no other guide. A Mohammedan is also obliged to lay off all costly parts of his dress before prayers, that he may not appear proud. Females are not allowed to enter the mosques along with the men, but they may visit them at other periods.

The prayers of the Mohammedans consist chiefly of pious exclamations, praising the greatness and goodness of God; and one of the more common of these prayers consists in a repetition of the first chapter of the Koran, called the *Fathat*, or Belief. It is in these words "Praise be to God, the Lord of all creatures; the most merciful, the King of the Day of Judgment. Thee do we worship, and of Thee do we beg assistance. Direct us in the right way, in the way of those to whom Thou

hast been gracious; not of those against whom Thou art incensed, nor of those who go astray."

Alms-giving is a necessary part of the religious practice of Mohammedans. These consist of cattle, money, corn, fruits, and wares which can be sold. At the end of the fast of the Ramadan, every Mohammedan is obliged to give in alms, for himself and for every one of his family, a measure of wheat, barley, dates, rasins, rice, or other provisions. "The legal alms," says Mr. Sale, "were at first collected by Mohammed himself, who employed them as he thought fit in the relief of his poor relations and followers, but chiefly applied them to the maintenance of those who served in his wars, and fought, as he termed it, in the way of God. His successors continued to do the same, till, in process of time, other taxes and tributes being inposed for the support of the government, they seem to have been weary of acting as almoners to their subjects, and to have left the paying of them to their consciences."

Fasting is the third point of religious practice among the Mohammedans. It consists in abstaining from satisfying the appetites; in restraining the ears, eyes, tongue, hands, feet, and other members, from sin, and the fasting of the heart from worldly cares, and thinking of nothing but God. During the month of the Ramadan, Mohammedans are obliged to fast from the time the new moon first appears till the appearance of the next new moon. In this month they abstain from eating and drinking from daybreak till sunset; and this injunction they observe so strictly, that while they fast, they suffer nothing to enter their mouths or the other parts of the body, esteeming the fast broken if they smell perfumes, bathe, or even purposely swallow their spittle. The old and the sick are exempted from this fast; but in the case of the latter, when they recover, they must fast the same number of days. After sunset the people are allowed to refresh themselves—to eat, drink, and enjoy the company of their wives till daybreak. The more rigid, however, commence the fast again at midnight.

According to the injunctions of the Koran, every man is to perform a pilgrimage to Mecca once in his life, except prevented by poverty or ill health. It is clear that such an observance is altogether inapplicable to the condition and situation of the great hulk of the human race: and what is impossible in human practice, can never have been enjoined by the Creator. Mohammed, it is evident, only thought of Arabia and its neighbourhood, when he planned this idle ceremonial observance. Aware that, even within that limited district, his followers would have a difficulty in performing such a pilgrimage, he allows any one who is wealthy enough, to hire and send a deputy; many, we are informed, neglect this duty who cannot plead a lawful excuse. The temple of Mecca stands in the midst of the city, and is called the sacred or inviolable temple. Within it are said to be the tomb of Ishmael, and a remarkable black stone, which bears the mark of Abraham's foot. This temple was held in great veneration by the Arabians long before the time of Mohammed; some even say that it was built by Adam immediately after his expulsion from paradise. To this place pilgrimages are made from all parts where the Mohammedan religion is professed. A number having collected from any particular district, form themselves into a caravan for the purpose of mutual protection, which is very necessary from the number of robbers who infest the route. The pilgrims meet at different places around Mecca, according to the direction in which they have come, and are obliged to be there by the beginning of the first month, called Dhulhajja.

"It is not," says Mr. Lane, "by the visit to Mecca, and the performance of the ceremonies of circuiting the temple seven times, and kissing the black stone in each round, and other rites in the holy city, that the Moslem acquires the title of the *hadji* (pilgrim). The final object of the pilgrimage is Mount Arafat, six hours journey from Mecca. During his performance of the required ceremonies at Mecca, and also during his sojourn at Arafat, and until his completion of the pilgrimage, the Moslem wears a peculiar dress called *ehhram* generally consisting of two simple pieces of cotton, or linen, or woollen cloth, without seam or ornament, one of which is wrapped round the loins, and the other over the shoulders; the instep and heel of each foot, and the head, must be bare; but umbrellas are now used by many of the pilgrims. It is necessary that the pilgrim should be present on the occasion of a Khootbeh, which is recited on Mount Arafat in the afternoon of the 9th of the month Dhulhajji. In the ensuing evening, after sunset, the pilgrims commence their return to Mecca. Halting the following day in the valley of Mina, or Moona, they complete the ceremonies of the pilgrimage by a sacrifice (of one or more male sheep, he-goats, cows, or she-camels, part of the flesh of which they eat, and part give to the poor), and by shaving the head and clipping the nails. Every one after this resumes his dress, or puts on a new one, if provided with such. The sacrifice is called *el fida* (or the ransom), as it is performed in commemoration of the ransom of Ishmael by the sacrifice of the ram, when he was himself about to have been offered up by his father; for it is the general opinion of Mohammedans, that it was this son and not Isaac who was to have been sacrificed by his father."

The laws by which Mohammedans are governed are in a great measure derived from the Koran. Where this sacred book is silent, reference is made to the traditions of the prophet to direct the decisions of the judge. Regarding the Koran as a book of jurisprudence, we quote the following from the Library of Useful Knowledge:—"Nothing but the prejudices of education could make a reasonable man look upon the Koran as a book of jurisprudence capable of conveying instruction to any but a nation of savages. Deficient in form, deficient in clearness, incomplete, it possesses not one single quality requisite to a body of law. In the midst of a vast farrago of nonsense, hidden amidst unmeaning explanations and dark mysterious prophecies, there sometimes appears a command respecting the distribution of property or the punishment of offenders. But no explanations are given—no regular description of the means by which property may be acquired; no enumeration of those by which the rights to it may be lost, is even attempted. The rights of individuals, in their several capacities, to the services of others, are nowhere distinctly mentioned; nor is there any the most distant approximation to a systematic view of the several obligations to which it was intended to subject the members of the community. As occasion prompted, or when a dispute happened, Mohammed was accustomed to issue a revelation, which answered for the immediate purpose. But the original unwritten customs of the Arabs remained in full force, receiving little modification from the decrees of the prophet. One advantage, and one alone, he may be supposed to have originated—his were *written* decrees; it was a commencement for a body of laws, though a rude and imperfect one. This benefit, however, is more than counterbalanced by the evil of their being irrevocable. What the ignorant barbarian instituted, succeeding generations have been obliged to retain. No matter how absurd, how injurious the decree, religion commands the faithful Moslem to abide by it. The Almighty was its author, and he is all-wise; and, moreover, is as wise at one time as another. How, then, shall we pretend to amend the divine ordination, or fancy that he himself need amend it? The conclusion is irresistible, provided the premises be allowed. The nations who have assumed the Moslem faith have consequently remained, and, while professing it, will remain, barbarians."

One of the worst features of the Mohammedan faith

the degraded position which it assigns to women. This, indeed, forms a radical error in the constitution of society in Mohammedan countries, and must be removed before there can be a steady advance in rational improvement. Women are considered in every respect inferior to men. Few of them, even among the highest classes, receive any instruction; they are carefully secluded from public observation; assigned in marriage without their own consent, on payment of a trifling sum in form of dowry; and are divorced at pleasure—all which tends to debase their minds, and to produce the worst kind of social vices. Polygamy and legal concubinage add to the evils caused by such practices. The Koran allows a man to marry four wives, and to maintain as many concubine slaves as he may choose. He may divorce any of his wives at any instant which caprice or passion may suggest, merely by uttering the emphatic words, "Thou art divorced!" and she must return to her parents or friends accordingly. He may take her again as a wife, and again divorce her; and even divorce her a third time, provided she has in the interval been married to and divorced from another man. Mr. Lane, in his work on Egypt, says, that he has known cases in which men have, in the course of a few years, married as many as twenty or thirty wives; and also cases of women who had been married to a dozen or more men successively. In most instances, we are told, a man marries no more than one wife; but as these practices are common, we can easily judge of the depravity of manners which prevails in those countries professing the Mohammedan creed.

From the manner in which females are treated, it has been generally supposed by Christians that the Mohammedans believe that women have no souls. But this is a mistake. Women are believed to have souls, and are not to be excluded from paradise, though they are there to perform offices of a subservient nature. The meanest person in paradise, it is believed, "is to have eighty thousand servants, and seventy-two wives of the girls of paradise, besides the wives he had in this world; that he is to inhabit a tent composed of pearls, jacinths, and emeralds; at meals he will be served in dishes of gold; and he is to be at liberty to drink freely of the wine of paradise, which will not intoxicate." In such promises of felicity, we have a striking proof of the mean ideas of eternal happiness formed by the prophet, as well as of his knowledge of mankind.

The Koran forbids the use of wine or any intoxicating liquors; and this is among the best injunctions which it contains. Opium and other inebriating drugs are understood to fall within the line of prohibition, though not mentioned. The use, therefore, of either intoxicating drinks or drugs, is considered immoral in all Mohammedan countries. Musselmans of all ranks are remarkable for their sobriety and temperance in food. The eating of swine's flesh is strictly prohibited; and, indeed, most animals forbidden to be eaten by the Mosaic law are alike forbidden by that of Mohammed. All animals used for food must be killed by cutting their throat; and, in performing the operation, the butcher must say, "In the name of God! God is most great!" Gambling is also prohibited; also usury, and the making of any images or pictorial resemblances of any thing that has life. Perhaps the desire to extinguish idolatry influenced the prophet in laying down the last-mentioned law. Apostacy from Islamism is deemed a most heinous sin, and must be punished with death.

The Mohammedan creed enjoins no Sabbath, like that of either the Jews or Christians, but selects Friday as a day in the week to be distinguished by more than usual solemnity of devotion. Friday has been pitched upon, because it is said Adam was created on that day, and because the resurrection is prophesied to be on that day of the week. Perhaps a desire to avoid Saturday or Sunday, the days reverenced respectively by Jews and Christians, may also have influenced its adoption. This day is called *El-Goumah*, or The Assembly, and on the forenoon of that day large congregations assemble in the mosques, when, in addition to the usual prayers, a sermon or address is delivered, and lessons read from the Koran, by the officiating imams. After prayers all kinds of work go on as usual.

All religions, above the meanest paganism, have possessed a body of priests, or functionaries to whom the knowledge of the faith was confided, and by whom its precepts were enforced. Considering that Mohammed must have been conversant with the constitution and import of the Jewish priesthood, as laid down in the Levitical law, and also acquainted with the arrangements of the Christian church, it is remarkable that he instituted no order of clergy, but, on the contrary, left his religion to be professed by the people at large, without any distinction as to rank or qualification. On this account, Mohammedism has no priesthood, and cannot be said to constitute in any country what we understand by the term church. Wherever it is established as the religion of the community, *mosques* or chapels have been erected, generally by endowments from wealthy individuals; and these are individually under the charge of a warden, who is custodier of the revenues, and appoints the ministers of religion and inferior servants. "Two imams are employed to officiate in each of the larger mosques: one of them, called the *khateeb*, preaches and prays before the congregation on the Friday; the other is an *imam ratib*, or ordinary imam, who recites the five prayers of every day in the mosque, at the head of those persons who may be there at the exact times of those prayers: but in most of the smaller mosques both these offices are performed by one imam. There are also to each mosque one or more *muezzins* (to chant the call to prayer) and *bowwabs* (or doorkeepers); and several other servants are employed to sweep the mosque, spread the mats, light the lamps, and attend the water-wheel by which the tank or fountain, and other receptacles for water, necessary to the performance of ablutions, are supplied. The imams, and those persons who perform the lower offices, are all paid from the funds of the mosque, and not by any contributions exacted from the people. The condition of the imams is very different, in most respects, from that of Christian priests. They have no authority above other persons, and do not enjoy any respect but what their reputed piety and learning may obtain them: nor are they a distinct order of men set apart for religious offices, like our clergy, and composing an indissoluble fraternity; for a man who has acted as imam to a mosque may be displaced by the warden of that mosque, and with his employment and salary, loses the title of imam, and has no better chance of being again chosen for a religious minister than any other person competent to perform the office. The imams obtain their livelihood chiefly by other means than the service of the mosque, as their salaries are very small, that of a khateeb being generally about a piastre (nearly 2½d. of our money) per month."—(*Lane's Egypt.*)

"The Mohammedans," continues the same authority, "observe the utmost decorum in their public worship. Their looks and behaviour in the mosque are not those of enthusiastic devotion, but of calm and modest piety. Never are they guilty of a designedly irregular word or action during their prayers. The pride and fanaticism which they exhibit in common life, in intercourse with persons of their own or of a different faith, seem to be dropped on their entering the mosque, and they appear wholly absorbed in the adoration of their Creator."

Mohammedans have an extreme reverence for a green colour, which is used exclusively as the hue of turbans or other garments by those who claim hereditary descent from the family of the prophet. Europeans generally imagine the crescent to be a common symbol of Mo-

hammedism, as the cross is of Christianity; but we believe this is founded on mistake. The crescent, from a very early period of history, was a heraldic ensign of Byzantium or Constantinople, and has been appropriated by the Turks since their capture of that city.

The Mohammedans are generally affected with the most superstitious reverence for imaginary saints and "favourites of God." They imagine that idiots and lunatics are under the immediate inspiration of Heaven; and, unless these be dangerously mischievous, they are permitted all sorts of license. "Most of the reputed saints of Egypt," says Mr. Lane, "are either lunatics, idiots, or impostors." Any one who is deranged by religious excitement becomes a *welee*, or an especial favourite of the Almighty, and is supposed to be gifted with supernatural powers. Almost every celebrated saint, deceased, is honoured by an anniversary birthday festival; and on occasion of these festivals, many persons visit the tomb of the saint, both as a duty and as a supposed means of obtaining a special blessing. Besides the various classes of saints, there are different orders of *durweeshes*, or dervises, some of whom subsist by begging, and others by performing at religious festivals; a few devote themselves to religious seclusion, and gain a character for exalted piety.

Mohammedism, from shortly after the death of its founder, has been divided into two great parties or sects, who split upon the disputes concerning the Caliphate, or spiritual and civil supremacy, and received the name of *Sunnites* and *Shiites*. The Sunnites take their appellation from the *Sunna*, or collections of traditions relating to Islamism, which they believe to be of equal importance with the Koran. The term *Shiites* signifies heretics, which they are called by the opposite party from their misbelief. The adherents of the doctrine that Ali, son-in-law of Mohammed, was properly his successor, reject the Sunna. The Turks are Sunnites, and the Persians are Shiites, and each hates the other with implacable animosity. The Sunnites, we believe, are reckoned the orthodox sect, and acknowledge the reigning sultan as the true successor of Mohammed.

Besides differing as to the credibility of the Sunna and the successorship of the prophet, the Mohammedan world is divided into four minor sects, the *Hhanafees*, *Shafees*, *Malikees*, and *Hhambeleen*, being so called from the respective doctors whose tenets they have adopted. "The Turks," says Mr. Lane, "are of the first sect, which is the most reasonable." About the middle of last century a great schism, or attempt at reformation, broke out in Arabia, headed by Mohamed, son of Abdel Wahab, a pious and learned sheikh. Young Mohamed claimed divine inspiration, and taught, like the Koran (the doctrines of which he but partially received), the existence of an only God, the Creator of the world, the rewarder of the good and the punisher of the bad; but he rejected all the stories contained in the Koran, especially those concerning Mohammed, whom he considered merely a man beloved of God, but branded the worship of him as a crime directly opposed to the true adoration of the Deity. He also condemned the ornaments and splendour which are found in the mosques and the sepulchres of pretended saints. In short, he stripped Mohammedism of all its trappings, and reduced it to little else than a pure Theism. All who should oppose this new doctrine were to be destroyed by fire and sword. His doctrines, being adopted by some influential chiefs, spread with wonderful celerity, and the *Wahabees*, as his followers were called, shook the stability of the empire of the Turks in Asia. After a hot war of many years, the Wahabees were suppressed by Mehemet Ali, the present Pasha of Egypt: but their doctrines are still far from being exterminated.

SUPERSTITIONS.

MANKIND have in all ages been prone to the most lamentable superstitions. The enlightened nations of antiquity were no more exempted from them than the most ignorant. The Jews, as we are repeatedly informed in Scripture, could with difficulty be restrained from idolatrous and superstitious practices, and confined to the worship and service of the only true God. This remarkable tendency of the Hebrew nation was in all likelihood caused by their sojourn for the space of four hundred years among the Egyptians, whose whole system of religion was a mass of idolatrous observances. They had a number of ideal gods to whom they erected temples of prodigious size and architectural splendour; the principal of these deities were Osiris and Isis, which are thought to have been typical of the sun and moon. But they also offered worship to various animals, as the ox or bull (hence the golden calf of the Hebrews), to which they gave the name of Apis; the dog, the wolf, the hawk, the ibis or stork, the cat, and other creatures; they likewise paid adoration to the Nile, personifying it in the crocodile, to which temples were erected, and priests set apart for its service. The Egyptians, notwithstanding their learning, also believed in dreams, lucky and unlucky days, omens, charms, and magic. In a word, they were grossly superstitious, and seem to have had but a feeble conception, if any, of the laws which regulate the ordinary phenomena of nature.

The absurdities of Egyptian superstition formed a basis for what followed among the Greeks and Romans, who had no idea of an omnipresent and omnipotent God, the Creator and Ruler of the universe. Their notions of divinity, like those of other pagans, were grovelling and contemptible. The gods whom they adored were imagined to have been at one period rulers or heroes on earth, and still had their habitation somewhere within the Grecian territory, or at no great distance from it. Besides their belief in this vain mythology, both Greeks and Romans put faith in divination, oracles, the magical power of amulets, and dreams. Bees, ants, and various reptiles and beasts, were imagined to have the power of giving omens of good or bad fortune. The phenomena of the atmosphere and planetary bodies were likewise a fertile source of superstitious delusions. The appearance of comets, and also eclipses, were ominous of great public disasters, it being the general belief that they were special signs made by the gods to warn mankind of approaching troubles; in all which we see a lamentable proof of the follies to which even a refined people may be exposed, if ignorant of the laws of nature.

The superstitious delusions of the Greeks and Romans may be said to have died out at the final dismemberment of the Roman empire, and the overrunning of western Europe by the Gothic nations. The introduction of Christianity also tended powerfully to root out the old

superstitious usages, though a few survived to a later date. For these reasons the superstitions and matters of credulous belief which afterwards affected the people of northern and western Europe, including the British islands, were in a great measure of Scandinavian and Gothic origin. The only superstitions of eastern growth worth mentioning, which were perpetuated in Europe generally, was that of astrology, or a belief that the stars exercised an influence over the destiny of mortals; and alchemy, or the pretended art of transmuting the baser metals into gold; both of which delusions finally vanished before the light of knowledge that spread abroad in the seventeenth and eighteenth centuries.

SCANDINAVIAN SUPERSTITIONS.

The superstitions of the European Northmen, or Scandinavians—under which term are included the early inhabitants of Denmark, Norway, Sweden, and Iceland—were of a kind remarkably accordant with the cold and stern character of the regions which they occupied. Like the ancient Greeks, the Scandinavians had seats of the gods and of the blest, which they called Asgard and Walhalla (or Valhalla), and these bore the same relation in their character to the Olympus and Elysium of the Greeks, that the countries of the north, with their stormy climes, their icy mountains, and perilous waters, bore to the perfumed and verdant plains of Hellas, and the fair blue skies overhanging the smooth Ionian Sea. Nothing could afford better proof of the utterly fanciful nature of all these mythologies, than the fact that they were thus modelled and modified in every case by the earthly habits, likings, territorial position, and ignorance of geography and astronomy, of the individual tribes among whom they respectively originated.

The deification of one or more great princes or rulers seems to have constituted the basis of the Scandinavian as well as of every other pagan mythology. Odin, the supreme deity of the Scandinavians, and the ruler of heaven and earth, appears, like the Hellenic Jupiter, to have been a distinguished chief and warrior of early times. Although it is asserted by some that a divinity of the name of Odin was worshipped from the most remote ages, there is reason to believe that the worship of this personage, in the north at least, had its real origin a few centuries before the commencement of the Christian era, when a powerful chieftain of the name was driven by the Romans from his dominions between the Euxine and Caspian, and took refuge in Scandinavia, the whole of which he subjected to his sway. Like Mohammed, this chief appears to have established a new religion, of which he himself assumed to be the earthly head, as the servant or minister of a divine being of the same name. In the course of time, however, this distinction was entirely lost, and the persons and acts of the divine and earthly Odin became inextricably blended in the mythology and traditions of the north. The great records of the religious and legendary knowledge of the Scandinavians, are the Eddas and Sagas of Iceland, partly written in poetry and partly in prose. The oldest of the Eddas, a series of poetical fragments, was collected from oral tradition in the eleventh century, and the others are of later date. The acts of the deities and heroes of the north, the creation of the world, and prophetic revelations, form the general subject of these pieces.

The Scandinavians, like the Greeks, believed that the universe was originally a chaos, or mass of confused vapours, peopled by a race of Rimthursar, or evil spirits of gigantic bulk. A being of nobler nature sprung up among these, named Bure, from whom were descended Odin and his two brothers Vile and Ve. These younger divinities followed exactly the same course with the northern giants, that was pursued by Jupiter and his brothers with regard to the Titans, or older and gigantic deities of Greece. Odin began to war with the Rimthursar, and having at last overcome their great chief Ymer, he created the world out of that giant's body. His flesh became the mould, his bones the rocks, his hair the vegetable tribes, his blood the ocean, and his skull the heavens, at the four corners of which were placed certain dwarfs, called North, South, East, and West, whose duty it was to sustain the celestial dome. After this, the luminaries of the sky were set in their places, and the order of the seasons appointed. Natt (night) wedded one of the Aser, or celestial family of Odin, and gave birth to Dag (day). These deities travel alternately round the world in cars, drawn by single horses. Every great body, as in the Grecian mythology, was represented by a divinity. Frigga, or the earth, was the daughter of Odin, and also became his wife. The inhabitants of the earth, or mankind, were created by Odin and his brothers. Two pieces of wood, the one of ash and the other of elm, formed the materials of the first pair of mortals, who were distinguished for personal beauty and intellectual ability.

The race of deities inhabited Asgard, a place supposed by some to have been the city in Asia whence the real or mortal Odin was expatriated. The fabulous Asgard was pictured as containing numerous palaces and halls, the largest of which was the Mansion of Joy, where Allfader (Odin) sat on his throne amid his divine family. This throne was named Lidskialfa, or the Terror of Nations, and from it he could overlook the whole earth. Two ravens, Hugin (Spirit) and Muninn (Memory), sat always at his ear, and communicated to him intelligence of all things that were going on in the universe. Among the deities who dwelt in Asgard, one of the most important was Thor, or Asathor, son of Odin by Frigga, and the Mars, or warrior-god, of the Scandinavians.

Thor is described as the god of thunder, and the strongest of beings, earthly or heavenly. He is the son of Odin and Frigga, or, in other words, of the Sun and the Earth. When he moves, the earth trembles. He holds in his hand a powerful hammer, called the Crusher (*miölner*), with which he annihilates all who oppose him, and who offend the gods. In battle Thor is always girt with a magic girdle, which has the power of inspiring him with a divine fury, and redoubling his strength. On his right hand he wears an iron gauntlet, with which he grasps and wields the formidable crusher. This latter instrument was forged by a dwarf, named Sindri, the prototype of the deformed blacksmith-deities of the Greeks, Vulcan and his Cyclops. The hammer possesses the wonderful power of never missing its aim, and when launched at any object, returns to the hand of Thor, after having destroyed his foe. Thor is sometimes called Aukistor, or Thor of the Car, from his riding on a chariot, drawn by two powerful he-goats, named Sangniostr and Tangrisner. This deity has a spouse named Sipia, famous for her beautiful hair.

After Odin, Thor was the most cherished deity of Scandinavia, and had statues and temples erected to him everywhere. The statues of him were usually formed of clay, and represented a tall figure, with a red-painted beard, indicative of the lightning which he was supposed to wield. Bread and meat were supplied daily to the god by his worshippers, and at stated times libations were poured out in his honour.

Balder, the second son of Odin, was the most beautiful and amiable of the Aser or gods. Unlike the rest of his brethren, he was fond of peace, and had the power of allaying tempests, and acting as a mediator, to avert divine wrath. His decrees were irrevocable. In some points he resembled the Apollo of the Greeks, but the general qualities of that personage found a closer representative in Braga or Bragi, the god of eloquence and poetry. Niord, the god of the sea, and his son Freya, the god of rain were also important deities of the north. Every element or important natural phenomenon, was

under the guidance, in like manner, of some celestial personage. Frigga, the Scandinavian Juno, was the bestower of fertility and plenty. Freia, or Freya, the daughter of Niord, was the Venus of Asgard and the patroness of matrimony. Freia was assisted in her duties by Siona and Sofna, the first of whom made lovers faithful, while the other reconciled them when they quarrelled. Eyra was the physician of the gods. There were various other minor divinities in the Scandinavian mythology, though not nearly so many as in the Grecian roll. The deficiency was made up among the northerns by the assignment of more multitudinous duties to the greater deities. Thus Odin, from the extent of his government, received as many as one hundred and twenty distinct names, each indicating some individual quality ascribed to him.

The great hall appointed for the reception of the spirits of the brave, when they left earth for the seat of the gods, was called Valhalla. Twelve beautiful yet terrible nymphs, named Valkyries (*choosers of the slain*), were the guides of the good spirits to the hall of Valhalla, and supplied them with mead. The occupation of drinking this northern nectar, and of eating the fat of the wild boar Serimner, which, after serving as the daily food of thousands, became whole again every night, filled up all those intervals of time in Valhalla that were not passed in fighting. None but those who had shown surpassing bravery on earth were admitted into this Scandinavian paradise, and when there, their daily amusement was to fight with one another till all or nearly all were cut in pieces. But little harm was done in this way, for the spiritual bodies soon reunited, and enabled the warriors to appear, entire in lithe and limb, at the feasts that followed these extraordinary engagements. The skulls of enemies were the drinking-cups used at the entertainments of Valhalla, and the guests are described as being almost perpetually in a state of inebriation. It was only when the cock announced the arrival of morning that these terrible heroes arose from table, to issue to the field of battle through the five hundred and forty gates of Valhalla, and hack each other to pieces anew. Such was the never-ending round of employment destined for the departed heroes of Scandinavia.

The mythology of the Scandinavians survived till a much later date than any other system of heathen worship in Europe. It was not abolished till the eleventh century St. Olaf, King of Norway, and a zealous supporter of Christianity, usually receives the credit of having overturned this most barbarous form of religion. In the course of his efforts to Christianize his subjects, he ordered a statue of Thor, and the pedestal on which it stood, to be broken in pieces, and showed the people that the meat which had been laid down for the use of the god was not eaten by him, but by a host of rats and other vermin that had formed a lodgment about the foundation of the colossal image. Whatever might have been the influence of the mythology of the Scandinavians in Britain, it disappeared shortly after its overthrow on the continent of Europe, or only lingered in a kind of traditional existence amidst the remote islands of Orkney and Shetland, till finally banished by the progress of a more general intelligence. The dread names of Odin, Thor, and other deities of the north, who for centuries weighed down the human faculties, and kept up the reign of superstition, are now only perpetuated in the appellations affixed to some of the days of the week. Thus our term *Wednesday* is derived from Odin's or Wodin's day, that being the day of the week in which the northern Jupiter or supreme ruler of the gods was most honoured and worshipped. *Thursday* is from Thor, the second in dignity among these fabulous deities: as this day was called Dies Jovis by the Romans, we have here a confirmation that Thor the thunderer was equivalent either to Mars, or the thundering Jove of the Grecian mythology. *Friday* takes its appellation from Freya the daughter of Niord, and corresponds with the Dies Veneris, or Venus day of the Greeks and Romans. *Saturday* is derived in the same manner from the god Saeter of the Scandinavians, and Saturn of the Greeks. *Tuesday*, or anciently Tiesday (a pronunciation still preserved in Scotland), is supposed to be from Tisa, the wife of Thor, and the reputed goddess of Justice. *Sunday* and *Monday* were respectively named from the Sun and Moon, both by the northern and southern nations of Europe, from a remote period of time. The circumstance of there being such a marked resemblance between the characters of the deities whose names were employed to distinguish the same days of the week both by Greeks and Scandinavians, is not a little remarkable, and has never, as far as we know, been the subject of explanation by philologists or antiquaries. The fact is only certain, that the names of the days of the week now used by every civilized people, are based upon the mythological observances of either the Grecian or Scandinavian races.

ANGLO-SAXON SUPERSTITIONS.

At a comparatively early era, the mythology and minor superstitions of the Scandinavians, as well as the follies of Druidism, disappeared in Britain as the familiar superstitions of the Anglo-Saxon race became predominant. Like the Scandinavians of the north, the Anglo-Saxons deduced their descent from Odin, whom they worshipped along with Thor, Freya, and other imaginary deities of the Gothic people. They also worshipped idols emblematic of the sun, moon, earth, and various seasons and circumstances. In particular, they sacrificed to one goddess called Eostre, in the month of April, and her name still expresses the festival of Easter in the Christian church. In token of devotional feelings towards the sun, they solemnized a festival to that luminary on the day of December in which the days began to lengthen, a log of wood being burnt on the occasion as an emblem of returning light and heat. From this ancient practice, therefore, may be traced the custom of bringing the Yule log at Christmas, which is still continued in many parts of England. Among the Anglo-Saxon superstitions was included a belief in giants, dwarfs, and elves, all of a spiritual order, but partaking in some degree of human attributes and feelings. In the term *elfi* or *elves*, we have one of the earliest traces on record of those ideal fairy tribes who afterwards figured in the familiar superstitions of the British islands. The Gothic nations, of whom the Anglo-Saxons were a branch, had various orders of elves, who were understood to haunt the fields, the woods, mountains, and waters, and received denominations accordingly, as field-elfin, dun-elfin, &c. Whether this varied race of spirits originated in the east, whence so many superstitions spread into ancient Europe, is not satisfactorily known, although it is probable that they did, and were of the same genus as the *peri* of the Persians, a being not dissimilar in character to our fay, or fairy. Both in the Scandinavian and Anglo-Saxon superstitions, elves formed an important order of beings, not unlike in character to the demigods, nayads, driads, and other imaginary spirits of the Greek and Roman mythologies, and like them exerted a certain influence over human affairs.

Besides a belief in these mysterious elfin tribes, the Anglo-Saxons brought with them to England the still darker and more dangerous doctrines of witchcraft and divination, before which the reasoning powers of the people quailed, and all intellectual advancement was impeded. The general introduction of Christianity about the year 600, abolished, as a matter of course, the more gross pagan observances, but failed to extirpate the familiar and less obvious superstitions of the people.

Witchcraft, wizardry, magic, divination, preparations of charms, and other mystic follies having no foundation in truth, continued to flourish, although opposed both by the more intelligent clergy and the kings. It is from the statutes, indeed, which Alfred, Canute, and other monarchs, passed for the prevention of magical practices, that we chiefly know their nature and extent. *Wiglaer*, a wizard, and *wicca*, a witch, are persons severely denounced. Penalties are enjoined if any one should destroy another by *wiccecraeft*. They appear to have used philtres, for it is declared a crime in any one to use witchcraft, or potions to produce another's love. Canute enjoins his people not to worship fire or floods, wells or stones, or any sort of trees; not to frame death-spells, either by lot or otherwise; and not to effect any thing by phantoms. Wizards, we also learn, pretended to the power of letting loose tempests, and controlling the visible operations of nature.

The introduction of Christianity, as has been mentioned, failed to dissipate the familiar superstitions of the English; a circumstance which can excite no surprise, as no pains were taken to enlighten the understandings of the people, or make them acquainted with the true causes of natural phenomena. We accordingly find that from the seventh to the sixteenth century, the belief in demons, spirits, lubber fiends, and elves, of every shade and character, prevailed without intermission, and with no further challenge from the clergy than as being individually manifestations of the devil, on whom now the whole load of superstition was based. One goblin, in particular, formed the theme of innumerable legends. What was his name originally in continental Europe, whence he emigrated with the Anglo-Saxons, is of little consequence; in England he became known by the title of Father Rush, from a belief that he had on one occasion personated a monk or friar, and, to serve his own malignant purposes, had in that capacity long imposed on a religious brotherhood; afterwards this appellation went out of repute, and he was popularly known and feared by the familiar name of Robin Goodfellow, and performed many useful services in the rural districts of England. It is not a little strange that both monks and clergy sanctioned these fancies, and increased their number by the propagation of legends, which we venture to say could not now receive the approbation of a single individual, lay or clerical, in England. Of these it is only necessary to mention the absurd stories which were fabricated and circulated respecting Dunstan, Abbot of Glastonbury, and afterwards Archbishop of Canterbury, who died in the year 988. When a boy, he is said to have studied theology so sedulously as to reduce him to the point of death, when he was suddenly restored by some divine medicine sent to him by an angel in a storm. So extraordinary a circumstance could not but demand grateful thanksgivings, and Dunstan started from his bed and ran with full speed towards the church. Satan met him in the way, surrounded him with numerous black dogs, and endeavoured to defeat his pious intention. But Dunstan was not to be overcome; he instantly prayed for ability, and he was enabled to cudgel the devil and his black dogs so effectually, that they left him and the angel together; the latter of whom, finding the church door fastened, took up the pious youth in his arms, and conveyed him to his devotions through the roof. Another time the devil attempted to intrude himself upon St. Dunstan's studies in the laboratory, but the saint speedily punished his impertinence, by taking from the fire his tongs, which were red hot, and with them seized the nose of the fiend, who was thereupon glad to make his escape. It is lamentable to think how such vain imaginations should have so long weighed upon the understandings of the people, and engrafted an habitual dread of the supernatural, which till this day exerts an influence over the untutored mind.

FAIRIES

Among the various supernatural beings to whom the ignorance and credulity of mankind have given an imaginary existence, the Fairies occupy a prominent place, and are especially worthy of notice. The characters of different classes of spirits have become so mingled and confounded together in the lapse of time, that it is difficult to define individual species with correctness and precision; but there is one characteristic which appears to distinguish the fairy from every other being of a similar order. Most spirits could contract and diminish their bulk at will, but the fairy alone seems to have been regarded as essentially small in size. The majority of other spirits also, such as dwarfs, brownies, and the like, are represented as deformed creatures, whereas the fairy has almost uniformly been described a beautiful miniature of the human being, perfect in face and form. These points of distinction, with a dress of pure green, are the principal ones which mark the personal individuality of the fairies as a supernatural race.

The origin of the fairy superstition is ascribed by most writers to the Celtic people, but the blending of the Gothic tribes with the Celts led to the admixture of many attributes of the northern spirits with those proper to the fairies. Thus, the latter race, which appears to have been intrinsically good and benevolent, has been gifted with attributes of the very opposite kind, borrowed from the trolls and elves of the north. In Scotland, and other countries where the Celtic traditions predominated, the fairies retained, in part, the original and better features of their character, and were usually called the Good Neighbours, or the Men of Peace; but even there, their character was deteriorated by a considerable leaven of elfin or dwarfish malignancy. This evil part of their nature caused much annoyance to mankind, and, more especially, their propensity to the kidnapping of human beings. Unchristened infants were chiefly liable to this calamity, but sometimes adult men and women were also carried off. The reason for these abductions is to be found, according to the authorities on this subject, in the necessities which the fairies lay under of paying "kane," as it was called, to the master-fiend, or, in other words, of yielding up one of their number septennially into his hands by way of tribute. They greatly prefer, on such occasions, to make a scape-goat of some member of the human family. They also carried off young married women to be nurses to their infants; and in Ireland, at this day, when a young woman falls victim to puerperal disease, the country people firmly assert that she has been removed for this purpose.

The necessity for the latter kind of kidnapping shows the fairies to have been *family* people. They are always represented as living, like mankind, in large societies, and under a monarchical form of government. The Salique law seems to have had no countenance among them, for we more often hear of fairy queens than of fairy kings, though both are frequently spoken of. The Land of Faërie was situated somewhere under ground, and there the royal fairies held their court. In their palaces all was beauty and splendour. Their pageants and processions were far more magnificent than any that eastern sovereigns could get up, or poets devise. They rode upon milk-white steeds. Their dresses, of brilliant green, were rich beyond conception; and when they mingled in the dance, or moved in procession among the shady groves, or over the verdant lawns of earth, they were entertained with delicious music, such as mortal lips or hands never could emit or produce. At the same time, most of the legendary tales on the subject represent these splendours as shadowy and unsubstantial. When the eye of a seer, or any one gifted with supernatural powers, was turned upon the fairy pageantries or banquets, the illusion vanished. Their seeming treasures of gold and silver became slate-stones, their stately halls became damp caverns,

and they themselves, from being miniature models of human beauty, became personifications of fantastic ugliness. In short, the Fairy Eden was a dream—a thing of show without substance.

This is the general account given of the fairy state, but few of the legends on the subject agree on all points. From a very early period, however, every fairy annalist concurred in giving to the king and queen of the fairies the names of Oberon and Titania. Oberon is the Elberich or Rich Elf of the Germans, and was endowed with his modern name, as well as with new attributes, by the old French romancers, who represented him as a tiny creature of surprising loveliness, with a crown of jewels on his head, and a horn in his hand that set all who heard it to the dancing.

It was the belief that unchristened children were peculiarly liable to be carried off by the fairies, who sometimes left little changelings, of their own blood, in place of the infants of mortal kind. Ben Jonson, in his Sad Shepherd, makes the tending and nurture of human changelings to be one of the favourite elfin employments.

> "There, in the stocks of trees, white fays do dwell,
> And span-long elves, that dance about a pool,
> With each a little changeling in their arms."

Various charms were used in Scotland for the restoration of stolen children. The most efficacious was believed to be the *roasting* of the supposititious child, upon live embers, when it was understood that the false infant would disappear, and the true one be left in its place. It is to be hoped that this cruel and monstrous practice was seldom followed. The possession of what are called *toadstones* was also held to be an efficient preservative against the abduction of children by the fairies. In Waldron's Account of the Isle of Man, we find various stories of children kidnapped by the fairies. In one case, where a woman had given birth to a child, her attendants were enticed from the house by the cry of "Fire!" and while they were out, the child was taken from the helpless mother by an invisible hand; but the sudden re-entry of some of the gossips compelled the fairies to drop the child, and it was found sprawling on the threshold. The fairies, who seemed to have taken a particular liking to this woman's offspring, tried to carry off her second child in the same way, but failed again. On the third trial, they succeeded, and left behind them a changeling, a withered and deformed creature, which neither spoke nor walked during an existence of nine years, and ate nothing but a few herbs. It is to be feared that this changeling superatition must have been the cause of much deplorable cruelty That very member of a family, who from natural misfortunes and defects required the kindliest tending, would but too often be neglected and wretchedly misused, on the plea of its being an alien. We may smile at many of the credulous fancies respecting the fairies, but there are in this order of superstitions, as in almost all others, some points which strongly exhibit to us the baleful effects inevitably attendant upon ignorance of every kind.

Numberless stories of a ridiculous kind have been told relative to the intercourse of the fairies with mankind. Some of the poor creatures arraigned in Scotland in past times for witchcraft, admitted having had correspondence with the fairies. There can be little doubt that these wretched beings, whom the *torture* forced into the confession of *some* kind or other of supernatural traffic, were induced to admit an association with fairies, in the hope that this would be looked upon as less sinful than a league with the enemy of mankind. The trials of Bessie Dunlop and Alison Pearson, in the year 1576 and 1588, illustrate this statement. Bessie Dunlop avowed that her familiar was one Thome Reid, the ghost of a soldier slain at Pinkie, in 1547, and who after his death seems to have become an inmate of Elf-land. She related that this Thome Reid, who appeared frequently to her in the likeness of an elderly man, gray coated and gray-bearded, wished her to go with him to the fairy country, and gave her herbs to cure various diseases. He even once brought her to the queen of the fairies, who, to the confusion of poetry, was a fat woman, fond of ale, and, in short, most unlike the Titania of romance. Alison Pearson also admitted her familiarity with the fairies, from whom she frequently received herbs for the cure of disease. It is remarkable that Patrick Adamson, an able scholar and divine, who was created Archbishop of St. Andrews by James VI., actually took the medicines prescribed by this poor woman, in the hope that they would transfer an illness with which he was seized to the body of one of his horses. This feat, it was believed, was accomplished by the prescription. The unfortunate women who confessed these things, were deceived in the expectation which led to the act. They could not so save themselves. They were both convicted, and perished at the stake.

It may not be improper in this place to allude to the fancies of the poets on the subject of the fairies. Shakspeare stands pre-eminent in this department. His Midsummer Night's Dream is a poem of exquisite beauty, and one corresponding in every respect with the delicately fanciful nature of the subject. In Romeo and Juliet, he has also described an important fairy, Queen Mab, who has almost dethroned Titania of late years. Mr. Tennant's Anster Fair has been of great avail to the fame of Mab. Whoever chooses to consult Drayton and the poets mentioned, will have the pleasure of observing and enjoying the exercise of poetical fancy of the highest order on the subject of fairies.

The superstitions now described are not yet extinct in the British Islands. In Ireland, the Scottish Highlands, and Wales, in particular, the fairies are yet objects of general belief. Education has not yet shed its enlightening influence there, and by education alone can the darkness of superstition be dispelled. This is almost a truism, for superstition and ignorance are nothing else than equivalent terms. The spirit is abroad, however, which will extinguish this remnant of barbarism, and it is consoling to think so, for the ills which have flowed from this source are numberless.

WITCHCRAFT.

A belief that certain individuals possessed magical powers, and could exercise a supernatural influence over their fellow-creatures, existed in ancient Rome, and those who practised, or rather *pretended* to exercise, such arts, were punishable by the civil magistrate. It is to be observed, that neither among the Roman nor the Pagan nations of northern Europe, was witchcraft deemed an offence against *religion*; in some instances, indeed, the witch was supposed to derive her powers from spirits friendly to mankind, and her profession, though feared, was held in honour by her infatuated dupes. Upon the introduction of Christianity, witchcraft assumed a new form, though retaining all its old attributes. Instead of ascribing the supernatural powers of the practitioner to the gods, to Odin, to spirits of good or evil qualities, or to supposed mysteries in nature, the people imputed them to the great fallen spirit mentioned in Scripture. This potent being, from a wicked desire to destroy all that was good and hopeful in man's destiny, was believed to enter into a compact with the aspirant witch, in which, for an irrevocable assignment of her soul at death, he was to grant all her wishes, and assist in all her malevolent projects. These new features in witchcraft, as we shall speedily perceive, thoroughly changed and prodigiously extended the superstition throughout Europe. From being rather sportive jugglery, or trick in practical magic, and at most only a civil offence, it was recognised as a crime of the deepest dye, meriting the most severe chastisement which the ecclesiastical and civil power could inflict.

We must here notice, however, that the demon or master-fiend of the witchcraft legends was a very different being from that great fallen spirit, held, in a graver view of things, so deeply to influence the best interests of humanity. As this superstition gained force in the Christian world, which it did by slow and successive steps through the whole of the middle ages, or from the fifth century till about the fifteenth, the devil—for it is impossible to avoid the mention of this emphatic name, disagreeable as it is commonly said to be to ears polite—gradually lost many of the former features of his character; or, rather, a different being was substituted for him, combining the characteristics of the Scandinavian Lokke with those of a Satyr of the heathen mythology—a personage equally wicked and malicious as the sterner spirit of evil, but rendered ludicrous by a propensity for petty trickery, and by such personal endowments as a pair of horns, a cow's tail, and cloven feet. There can be no doubt that the demon of the middle ages borrowed these attributes from his human representatives in the old mysteries and plays, where a laudable endeavour was made to make the evil one as ugly as possible. We are told, it is true, that he could at will assume any specious disguise that suited him, but the eye of the initiated observer could readily detect the "cloven foot"—or, in other words, penetrate his true character. Such as he was, he played an important part in the annals of modern witchcraft, which was supposed to rest entirely on the direct and personal agency of himself and the imps commissioned by him. Nor was this supposition confined to the illiterate, or to persons of peculiarly credulous temperament. Authors, distinguished for sense and talent, record with great seriousness, that the devil once delivered a course of lectures on magic at Salamanca, habited in a professor's gown and wig; and that at another time he took up house at Milan, lived there in great style, and assumed, rather imprudently one would say, the suspicious yet appropriate title of the "Duke of Mammon." Even Luther entertained similar notions about the fiend, and, in fact, thought so meanly of him as to believe that he could come by night and steal nuts, and that he cracked them against the bedposts, for the solacement of his monkey-like appetite.

The powers ascribed to this debased demon were exceedingly great. The general belief was, that through his agency storms at sea and land could at all seasons be raised; that crops could be blighted and cattle injured; that bodily illness could be inflicted on any person who was the object of secret malice; that the dead could be raised to life; that witches could ride through the air on broomsticks, and transform themselves into the shapes of cats, hares, or other animals, at pleasure. An old writer, speaking of the powers of witches, says—"1. Some work their bewitchings only by way of invocation or imprecation. They wish it, or will it; and so it falls out. 2. Some by way of emissary, sending out their imps, or familiars, to crosse the way, justle, affront, flash in the face, barke, howle, bite, scratch, or otherwise infest. 3. Some by inspecting, or looking on, or to glare, or peep at with an envious and evil eye. 4. Some by a hollow muttering or mumbling. 5. Some by breathing and blowing on. 6. Some by cursing and banning. 7. Some by blessing and praising. 8. Some revengefully, by occasion of ill turnes. 9. Some ingratefully, and by occasion of good turnes. 10. Some by leaving something of theirs in your house. 11. Some by getting something of yours into their house. 12. Some have a more speciall way of working by severall elements—earth, water, ayre, or fire. But who can tell all the manner of wayes of a witch's working; that works not only darkly and closely, but variously and versatilly, as God will permit, the devil can suggest, or the malicious hag devise to put in practice!"

In the present age of comparative intelligence, it is difficult to understand how human beings could be so deplorably ignorant as to entertain such a gross superstition. We must, however, recollect that the belief was greatly fostered by religious impressions, and that it was long considered a mark of impiety to doubt the existence of witches. Various other circumstances helped to cherish and magnify the error. The true causes of th majority of natural phenomena were unknown. The nature of the atmosphere, and of certain meteoric appearances—of the laws which regulate storms at sea, and tides—of human maladies and their remedies—were enveloped in obscurity. Natural causes being unknown, and the very doctrine of them unacknowledged, the weak and easily terrified mind flew to the conclusion that all evil proceeded from a power malignant to man, and that by certain impious dealings it was possible for man himself to direct that power against his neighbour.

The superstition seems to have approached its height about the end of the fifteenth century. In his bull of 1484, Pope Innocent charged inquisitors and others to discover and destroy all such as were guilty of witchcraft. This commission was put into the hands of a wretch called Sprenger, with directions that it should be put in force to its fullest extent. Immediately there followed a regular form of process and trial for suspected witches, entitled *Malleus Maleficarum*, or a Hammer for Witches, upon which all judges were called scrupulously to act. The edict of 1484 was subsequently enforced by a bull of Alexander VI. in 1494, of Leo X. in 1521, and of Adrian VI. in 1522, each adding strength to its predecessor, and the whole serving to increase the agitation of the public mind upon the subject. The results were dreadful. A panic fear of witchcraft took possession of society. Every one was at the mercy of his neighbour. If any one felt an unaccountable illness, or a peculiar pain in any part of his body, or suffered any misfortune in his family or affairs, or if a storm arose and committed any damage by sea or land, or if any cattle died suddenly, or, in short, if any event, circumstance, or thing occurred out of the ordinary routine of daily experience, the cause of it was witchcraft. To be accused was to be doomed, for it rarely happened that proof was wanting, or that condemnation was not followed by execution. Armed with the Malleus Maleficarum, the judge had no difficulty in finding reasons for sending the most innocent to the stake. If the accused did not at once confess, they were ordered to be shaved and closely examined for the discovery of the devil's marks; it being a tenet in the delusion that the devil, on inaugurating any witch, impressed certain marks on her person; and if any strange mark was discovered, there remained no longer any doubt of the party's guilt. Failing this kind of evidence, torture was applied, and this seldom failed to extort the desired confession from the unhappy victim. A large proportion of the accused witches, in order to avoid these preliminary horrors, confessed the crime in any terms which were dictated to them, and were forthwith led to execution. Other witches, as has been said, seemed to confess voluntarily, being probably either insane persons, or feeble-minded beings, whose reason had been distorted by brooding over the popular witchcraft code. A few extracts from the work of Dr. Hutchinson will show the extent of these proceedings:—

"A. D. 1485.—Cumanas, an inquisitor, burnt forty-one poor women for witches, in the county of Burlin, in one year. He caused them to be shaven first, that they may be searched for marks. He continued the prosecutions in the year following, and many fled out of the country.

"About this time, Alciat, a famous lawyer, in his *Parergu*, says, 'One inquisitor burnt a hundred in Piedmont, and proceeded daily to burn more, till the people rose against the inquisitor, and chased him out of the country.'

"A. D. 1488.—A violent tempest of thunder and light-

ning in Constance destroyed the corn for four leagues round. The people accused one Anne Mindelin, and one Agnes, for being the cause of it. They confessed, and were burnt.

"About this time, H. Institor says, one of the inquisitors came to a certain town, that was almost desolate with plague and famine. The report went, that a certain woman, buried not long before, was eating up her winding-sheet, and that the plague would not cease till she had made an end of it. This matter being taken into consideration, Scultetus, with the chief magistrate of the city, opened the grave, and found that she had indeed swallowed and devoured one-half of her winding-sheet. Scultetus, moved with horror at the thing, drew out his sword, and cut off her head, and threw it into a ditch, and immediately the plague ceased! and, the inquisition sitting upon the case, it was found that she had long been a reputed witch.

"A. D. 1524.—About this time a thousand were burned in one year, in the diocese of Como, and a hundred per annum for several years together."

From other authorities it is learned that the devastation was as great in Spain, France, and northern Germany, as it was in the Italian states. About the year 1515, five hundred witches were burned in Geneva in three months, and in France many thousands. An able writer in the Foreign Quarterly Review,* sums up the following particulars respecting the executions for witchcraft in some of the German states:—

"In Germany, to which indeed the bull of Innocent bore particular reference, this plague raged to a degree almost inconceivable. Bainberg, Paderborn, Wurtzburg, and Treves were its chief seats, though for a century and a half after the introduction of the trials under the commission, no quarter of that great empire was free from its baneful influence. A catalogue of the executions at Wurtzburg for the period from 1627 to February 1629, about two years and two months, is printed by Hauber in the conclusion of his third volume of the Acta et Scripta Magica. It is regularly divided into twenty-nine burnings, and contains the names of 157 persons, Hauber stating at the same time that the catalogue is not complete. It is impossible to peruse this list without shuddering with horror. The greater part of this catalogue consists of old women or foreign travellers, seized, as it would appear, as foreigners were at Paris during the days of Marat and Robespierre: it contains children of twelve, eleven, ten, and nine years of age; fourteen vicars of the cathedral; two boys of noble families, the two little sons of the senator Stolzenburg; a stranger boy; a blind girl; Gobel Babelin, the handsomest girl in Wurtzburg, &c. And yet, frightful as this list of 157 persons executed in two years appears, the number is not (taking the population of Wurtzburg into view) so great as the Lindheim process from 1660 to 1664; for in that small district, consisting at the very utmost of 600 inhabitants, thirty persons were condemned and put to death, making a twentieth part of the whole population consumed in four years.

"How dreadful are the results to which these data lead! If we take 157 as a fair average of the executions at Wurtzburg (and the catalogue itself states that the list was by no means complete), the amount of executions there in the course of the century preceding 1628, would be 15,700. We know that from 1610 to 1660 was the great epoch of the witch trials, and that so late as 1749, Maria Renata was executed at Wurtzburg for witchcraft; and though in the interval between 1660 and that date, it is to be hoped that the number of these horrors had diminished, there can be little doubt that several thousands fall to be added to the amount already stated. If Bainberg, Paderborn, Treves, and the other Catholic bishoprics, whose zeal was not less ardent, furnished an equal contingent, and if the Protestants, as we know, actually vied with them in the extent to which these cruelties were carried, the number of victims from the date of Innocent's bull to the final extinction of these prosecutions, must considerably exceed 100,000 in Germany."

* No. XI. 1830.

WITCHCRAFT IN SCOTLAND.

The mania respecting witchcraft, which sprang up into vigour throughout southern Europe in consequence of the edicts of Innocent and Leo, spread in time to Scotland, and acquired strong possession of the public mind during the reign of Queen Mary. At that period, an act was passed by the Scottish Parliament for the suppression and punishment of witchcraft; but this only served, as the papal bulls had done, to confirm the people in their maniacal credulity, and to countenance and propagate the general delusion. In terms of these ill-judged statutes, great numbers of persons, male as well as female, were charged with having intercourse with the devil, convicted and burned on the Castlehill of Edinburgh and elsewhere. This continued during the early part of the reign of James VI., whose mind, unfortunately for the more aged of the female part of his subjects, was deeply impressed with the flagrant nature of the crime of witchcraft. In 1590, James, it is well known, made a voyage to Denmark, to see, marry, and conduct home in person, his appointed bride, the Princess Anne. Soon after his arrival a tremendous witch conspiracy against the happy conclusion of his homeward voyage was discovered, in which the principal agents appeared to be persons considerably above the vulgar. One was Mrs. Agnes Sampson, commonly called the *Wise Wife of Keith* (Keith being a village in East-Lothian), who is described as "grave, matron-like, and settled in her answers." On this occasion, the king was induced by his peculiar tastes to engage personally in the business of judicial investigation. He had all the accused persons brought before himself for examination, and even superintended the tortures applied to them to induce confession. The statements made by these poor wretches form a singular tissue of the ludicrous and horrible in intimate union.

"The said Agnis Sampson was after brought again before the king's majestie and his council, and being examined of the meetings and detestable dealings of those witches, she confessed, that upon the night of All-Hallow Even she was accompanied, as well with the persons aforesaid, as also with a great many other witches, to the number of two hundred, and that all they together went to sea, each one in a riddle, or sieve, and went in the same very substantially, with flaggons of wine, making merrie and drinking by the way in the same riddles, or sieves, to the Kirk of North-Berwick, in Lothian, and that after they had landed, took hands on the land, and danced this reil, or short daunce, singing all with one voice,

'Cummer, goe ye before, cummer, goe ye;
Gif ye will not goe before, cummer, let me.'

At which she confessed that Geillis Duncan did goe before them, playing this reil or daunce upon a small trump, called a Jew's harp, until they entered into the Kirk of North-Berwick. These made the king in a wonderful admiration, and he sent for the said Geillis Duncan, who upon the like trump did play the said daunce before the king's majestie, who, in respect of the strangeness of these matters, took great delight to be present at their examinations."

In the sequel of Agnes Sampson's confession we find some special reasons for the king's passionate liking for these exhibitions, in addition to the more love of the marvellous. The witches pandered to his vanity on all occasions, probably in the vain hope of mitigating their own doom. Agnes Sampson declared that one great object

with Satan and his agents was to destroy the king; that they had held the great North-Berwick convention for no other end; and that they had endeavoured to effect their aim on many occasions, and particularly by raising a storm at sea when James came across from Denmark. "The witches demanded of the divell why he did beare such hatred to the king? who answered, by reason the king is the greatest enemie hee hath in the world." Such a eulogy, from such a quarter, could not but pamper the conceit of "the Scottish Solomon."

The following further points in the deposition of Agnes Sampson are worthy of notice. "*Item*, She went with the witch of Carrieburn, and other witches, to the Kirk of Newton, and taking up dead folks and jointing them [cutting off fingers, &c.], made enchanted powders for witchcraft. *Item*, She went with other witches in a boat, the devil going before them like a rock of hay. *Item*, The devil, in the shape of a dog, gave her responses concerning her laird's recovery, and endeavoured to put awa ane of the ladies' daughters. *Item*, She raised a universal great storm in the sea when the queen was coming to Scotland, and *wrote a letter* to that effect to a witch at Leith. *Item*, She used this prayer in the healing of sickness:—

All kinds of ill that ever may be," &c.

The repetition of these and such like verses by the confessing witches, has been matter of frequent surprise. But it must be remembered that a code of witchcraft, extensively known and accredited, existed at that day, regular forms and rules for its exercise having been laid down in the course of time. It must be recollected, also, that these poor creatures, though guiltless of all supernatural intercourse, had really pretended to the gift of healing by charms and incantations in many cases, and had to invent or learn formulas for the purpose. Besides, we find these doggrel scraps chiefly in the revelations of Agnes Sampson. She, it is stated, could write, and of course could read also; and hence she is to be regarded as a person who had superior opportunities for acquiring a knowledge of the witchcraft code, as well as superior capabilities for filling up deficiencies on the spur of the moment. In her confession she implicated one Doctor Fian, otherwise called John Cunningham, master of the school at Saltpans, in Lothian, a man whose story may be noticed at some length, as one of the most curious and instructive in the whole annals of Scottish witchcraft.

Mrs. Sampson deposed that Dr. Fian was always a prominent person at the witch-meetings, and Geillis Duncan, the marvellous trump-player, confirmed this assertion. Whether made through heedlessness or malice, these averments decided Fian's fate. He was seized, and after being "used with the *accustomed paine* provided for those offences inflicted upon the rest, first, by *drawing of his head with a rope*, whereat he would confess nothing;" and, secondly, being urged "by fair meanes to confesse his follies," which had as little effect; "lastly, hee was put to the most severe and cruell paine in the world, called the bootes, when, after he had received three strokes, being inquired if he would confesse his actes and wicked life, his tongue would not serve him to speake; in respect whereof, the rest of the witches willed to search his tongue, under which was founde two pinnes thrust up into the heade, whereupon the witches did say, now is the charme stinted, and showed that those charmed pinnes were the cause he could not confesse any thing; then was he immediately released of the bootes, brought before the king, and his confession was taken." Appalled by the cruel tortures he had undergone, Fian seems now only to have thought how he could best get up a story that should bring him to a speedy death. He admitted himself to be the devil's "register," or clerk, who took the oaths from all witches at their initiation, and avowed his having bewitched various persons. In proof of the latter statement he instanced the case of a gentleman near Saltpans, whom he had so practised upon, he said, that the victim fell into fits at intervals. This person, who seems to have been either a lunatic or afflicted with St. Vitus's dance, was sent for, and "being in his majestie's chamber, suddenly hee gave a great scritch, and fell into madnesse, sometimes bending himself, and sometimes capring so directly up, that his heade did touch the seeling of the chamber, to the great admiration of his majestie." On these and other accounts Dr. Fian was sent to prison, but he contrived soon after to escape from it. "By meanes of a hot and harde pursuite," he was retaken, and brought before the king to be examined anew. But the unfortunate man had had time to think, and like Cranmer under somewhat similar circumstances, resolved to retract the admissions which the weakness of the body had drawn from him, and to suffer any thing rather than renew them. He boldly told this to the king; and James, whom these records make us regard with equal contempt and indignation, ordered the unfortunate man to be subjected to the following most horrible tortures. "His nailes upon all his fingers were riven and pulled off with an instrument called in Scottish a *turkas*, which in England are called a payre of pincers, and under everie nayle there was thrust in two needles over, even up to the heades; at all which tormentes, notwithstanding, the doctor never shrunk a whit, neither would he then confesse it the sooner for all the tortures inflicted on him. Then was hee, with all convenient speed, by commandement, convaied again to the torment of the bootes, wherein he continued a long time, and did abide so many blowes in them, that his legges were crusht and beaten together as small as might bee, whereby they were made unserviceable for ever." Notwithstanding all this, such was the strength of mind of the victim, or, as King James termed it, "so deeply had the devil entered into his heart," that he still denied all, and resolutely declared that "all he had done and said before was only done and said for fear of the paynes which he had endured." As, according to this fashion of justice, to confess or not to confess was quite the same thing, the poor schoolmaster of Saltpans was soon afterwards strangled, and then burned on the Castlehill of Edinburgh (January, 1591).

Much about the same time that Agnes Sampson made her confessions, some cases occurred, showing that witchcraft was an art not confined to the vulgar. A woman of high rank and family, Catherine Ross, Lady Fowlis, was indicted at the instance of the king's advocate for the practice of witchcraft. On inquiry it was clearly proved that this lady had endeavoured, by the aid of witchcraft and poisons, to take away the lives of three or more persons who stood between her and an object she had at heart. She was desirous to make young Lady Fowlis possessor of the property of Fowlis, and to marry her to the Laird of Balnagown. Before this could be effected, Lady Fowlis had to cut off her sons-in-law, Robert and Hector Munro, and the young wife of Balnagown, besides several others. Having consulted with witches, Lady Fowlis began her work by getting pictures of the intended victims made in clay, which she hung up, and shot at with arrows shod with flints of a particular kind, called elf-arrow heads. No effect being thus produced, this really abandoned woman took to poisoning ale and dishes, none of which cut off the proper persons, though others who accidentally tasted them lost their lives. By the confession of some of the assistant hags, the purposes of Lady Fowlis were discovered, and she was brought to a trial; but a local or provincial jury of dependants acquitted her. One of her purposed victims, Hector Munro, was then tried in turn for conspiring with witches against the life of his brother George. It was proved that a curious ceremony had been practised

to effect this end. Hector, being sick, was carried abroad in blankets, and laid in an open grave, on which his foster-mother ran the breadth of nine riggs, and, returning, was asked by the chief attendant witch, "which she chose should live, Hector or George?" She answered, "Hector." George Munro did die soon afterwards, and Hector recovered. The latter was also acquitted, by a provincial jury, on his trial.

These disgraceful proceedings were not without their parallel in other families of note of the day. Euphemia Macalzean, daughter of an eminent judge, Lord Cliftonhall, was burned at the stake in 1591, having been convicted, if not of witchcraft, at least of a long career of intercourse with pretenders to witchcraft, whom she employed to remove obnoxious persons out of her way —tasks which they accomplished by the very simple means of poisoning, where they did accomplish them at all. The jury found this violent and abandoned woman, for such she certainly was, guilty of participation in the murder of her own god-father, of her husband's nephew, and another individual. They also found her guilty of having been at the Wise Woman of Keith's great witch-convention of North-Berwick: but every witch of the day was compelled to admit having been there, out of compliment to the king, to whom it was a source of agreeable terror to think himself of so much importance as to call for a solemn convocation of the powers of evil to overthrow him. Euphemia Macalzean was "burnt in assis, *quick*, to the death." This was a doom not assigned to the less guilty. Alluding to cases of this latter class, a writer (already quoted) in the Foreign Quarterly Review remarks, "In the trials of Bessie Roy, of James Reid, of Patrick Currie, of Isobel Grierson, and of Grizel Gardiner, the charges are principally of taking off and laying on diseases either on men or cattle; meetings with the devil in various shapes and places; raising and dismembering dead bodies for the purpose of enchantments; destroying crops; scaring honest persons in the shape of cats; taking away women's milk; committing housebreaking and theft by means of enchantments, and so on. South-running water, salt, rowan-tree, enchanted flints (probably elf-arrow heads), and doggrel verses, generally a translation of the Creed or Lord's Prayer, were the means employed for effecting a cure." Diseases, again, were laid on by forming pictures of clay or wax; by placing a dead hand or some mutilated member, in the house of the intended victim; or by throwing enchanted articles at his door. A good purpose did not save the witch; intercourse with spirits, in any shape, being the crime.

Of course, in the revelations of the various witches, inconsistencies were abundant, and even plain and evident impossibilities were frequently among the things averred. The sapient James, however, in place of being led by these things to doubt the whole, was only strengthened in his opinions, it being a maxim of his, that the witches were "all extreme lyars." Other persons came to different conclusions from the same premises, and before the close of James's reign, many men of sense began to weary of the torturings and incrimations that took place almost *every day*, in town or country, and had done so for a period of thirty years (between 1590 and 1620). Advocates now came forward to defend the accused, and in their pleadings ventured even to arraign some of the received axioms of "Daemonologie" laid down by the king himself, in a book bearing that name. The removal of James to England moderated, but it did not altogether stop, the witch prosecutions. After his death they slackened more considerably. Only eight witchcraft cases are on the Record as having occurred between 1625 and 1640 in Scotland, and in one of these cases, remarkable to tell, the accused escaped. The mania, as it appears, was beginning to wear itself out.

As the spirit of puritanism gained strength, however, which it gradually did during the latter part of the reign of Charles I., the partially cleared horizon became again overcast, and again was this owing to ill-judged edicts, which, by indicating the belief of the great and the educated in witchcraft, had the natural effect of reviving the frenzy among the flexible populace. The General Assembly was the body in fault on this occasion, and from this time forward the clergy were the great witch-hunters in Scotland. The Assembly passed condemnatory acts in 1640, 43, 44, 45, and 49, and with every successive act the cases and convictions increased, with even a deeper degree of attendant horrors than at any previous time. "The old impossible and abominable fancies," says the review formerly quoted, "of the *Malleus* were revived. About thirty trials appear on the Record between 1649 and the Restoration, only one of which appears to have terminated in an acquittal; while at a single circuit, held at Glasgow, Stirling, and Ayr, in 1659, seventeen persons were convicted and burnt for this crime." But it must be remembered that the phrase "on the Record" alludes only to justiciary trials, which formed but a small proportion of the cases really tried. The justiciary lists take no note of the commissions perpetually given by the privy-council to resident gentlemen and clergymen to try and burn witches in their respective districts. These commissions executed people over the whole country in multitudes. Wodrow, Lamont, Mercer, and Whitelocke, prove this but too satisfactorily.

The clergy continued, after the Restoration, to pursue these imaginary criminals with a zeal altogether deplorable. The Justiciary Court condemned twenty persons in the first year of Charles II.'s reign (1661), and in one day of the same year the council issued fourteen new provincial commissions, the aggregate doings of which one shudders to guess at. To compute their condemnations would be impossible, for victim after victim perished at the stake, unnamed and unheard of. Morayshire became at this particular period the scene of a violent fit of the great moral frenzy, and some of the most remarkable examinations signalizing the whole course of Scottish witchcraft took place in that county. The details, though occasionally ludicrous for their absurdity, are too horrible for narration in the present pages.

The popular frenzy seems to have exhausted itself by its own virulence in 1661–62, for an interval of six years subsequently elapsed without a single justiciary trial for the crime of witchcraft, and one fellow was actually whipped for charging some person with it. After this period, the dying embers of the delusion only burst out on occasions, here and there, into a momentary flame. In 1678, several women were condemned, "on their own confession," says the Register; but we suspect this only means, in reality, that one malicious being made voluntary admissions involving others, as must often have been the case, we fear, in these proceedings. Scattered cases took place near the beginning of the eighteenth century, such as those at Paisley in 1697, at Pittenweem in 1704, and at Spott about the same time. It is curious, that, as something like direct evidence became necessary for condemnation, that evidence presented itself, and in the shape of possessed or enchanted young persons, who were brought into court to play off their tricks. The most striking case of this nature was that of Christian Shaw, a girl about eleven years old, and the daughter of Mr. Shaw, of Bargarran, in Renfrewshire. This wretched girl, who seems to have been an accomplished hypocrite, young as she was, quarrelled with a maid-servant, and, to be revenged, fell into convulsions, saw spirits, and, in short, feigned herself bewitched. To sustain her story, she accused one person after another, till not less than twenty were implicated, some of them children of the ages of twelve and fourteen! They were tried on the evidence of the girl, and five human beings perished through her malicious impostures. It is remarkable that

this very girl afterwards founded the thread manufacture in Renfrewshire. From a friend who had been in Holland, she learned some secrets in spinning, and, putting them skilfully in practice, she led the way to the extensive operations carried on in that department of late years. She became the wife of the minister of Kilmaurs, and, it is to be hoped, had leisure and grace to repent of the wicked misapplication, in her youth, of those talents which she undoubtedly possessed.

The last justiciary trial for witchcraft in Scotland was in the case of Elspeth Rule, who was convicted in 1708, and—banished. The last regular execution for the crime is said to have taken place at Dornoch, in 1722, when an old woman was condemned by David Ross, sheriff of Caithness. But we fear the provincial records of the north, if inquired into, would show later deaths on this score. However, here may be held to end the tragical part of the annals of Scottish witchcraft. The number of its victims, for reasons previously stated, it would be difficult accurately to compute, but the black scroll would include, according to those who have most attentively inquired into the subject, upwards of FOUR THOUSAND persons! And by what a fate they perished! Cruelly tortured while living, and dismissed from life by a living death amid the flames! And for what? For an impossible crime! And who were the victims, and who the executioners? The victims, in by far the majority of cases, were the aged, the weak, the deformed, the lame, and the blind; those to whom nature had been ungentle in her outward gifts, or whom years and infirmities had doomed to poverty and wretchedness; exactly that class of miserable beings, in short, for whom more enlightened times provide houses of refuge, and endow charitable institutions, aiming, in the spirit of true benevolence, to supply to them that attention and support which nature or circumstances have denied them the power of procuring for themselves. Often, too, was the victim a person distinguished by particular gifts and endowments: gifts bestowed by the Creator in kindness, but rendered fatal to the possessor by man. These were the victims of witchcraft. The executioners were the wisest and greatest of their time. Men distinguished above their fellows for knowledge and intelligence, ministers of religion and of the laws, kings, princes, and nobles—these, and such as these, judged of the crime, pronounced the doom, and sent the poor victim of delusion to the torture, the stake, and the scaffold.

WITCHCRAFT IN ENGLAND.

Witchcraft was first denounced in England by formal and explicit statutes, in the year 1541, in the reign of Henry VIII. Previously to that time, many witch trials had taken place, and severe punishments had even been inflicted on the parties concerned; but this was occasioned by the direction of the arts of sorcery, in these particular instances, against the lives and well-being of others, and not from the legal criminality of such arts themselves. Shakspeare has made some early cases of this nature familiar to us, and in particular that of the Duchess of Gloucester, who, for conspiring with witches against the life of the reigning sovereign, Henry VI., was compelled to do public penance, and imprisoned for life. But, as has been said, the mode of prosecuting the guilty purpose was here altogether a subsidiary matter. If a person waved his hat three times in the air and three times cried "Buzz!" under the impression that by that formula the life of another might be taken away, the old law and lawmakers (as, for example, Selden, who states this very case) considered the formulist worthy of death as a murderer in intent; and upon this principle the trafficking with witches was punished in early times.

Witchcraft, however, by and by assumed greater statutory importance, in England as elsewhere. Henry VIII.'s two acts were levelled against conjuration, witchcraft, false prophecies, and pulling down of crosses. Here the charge was still something beyond mere sorcery, and it was left for Elizabeth, in 1562, to direct a statute exclusively against that imaginary crime. At the same time, that princess extenuated her conduct in part, by limiting the penalty of the crime, when stripped of its customary accessories, to the pillory. The first transgression, at least, received no heavier punishment. The cases of Elizabeth's reign were chiefly cases of pretended possession, sometimes, however, involving capital charges against those said to have caused the possession. In one famous case, of which the main features were as ludicrous as the issue was deplorable, three poor persons, an old man named Samuel, with his wife and daughter, were tried at Huntingdon, for having bewitched the children of a Mr. Throgmorton. Joan Throgmorton, a girl of fifteen, and the eldest of the children, was the main witness for the prosecution. She related many scenes, in which the actors were herself and a number of spirits sent by Dame Samuel to torment her, and to throw her into fits. These spirits, she said, were on familiar terms with her, and were named Pluck, Hardname, Catch, Blue, and three Smacks, who were *cousins*. Among other things she said that one of the Smacks professed himself an admirer of her's, and beat the rest for her sake, as in the following instance related by her. One day Smack appeared before her. "Whence come you, Mr. Smack?" she said to him. "From fighting Pluck and the rest, with cowl-staves, in Dame Samuel's back-yard," replied Smack; and soon thereafter, accordingly, Pluck and Blue walked in, the one with his head broken, and the other limping. "How do you manage to beat them?" said the young lady to the victorious Smack; "you are little and they are big." "Oh," says Smack, "I can take up any two of them, and my cousins beat the rest." Of such stuff were these charges made. It would appear that they were either the offspring of insanity on the part of the youthful Throgmortons, or that, having begun the farce in sport or spite, the accusers found at length that they could not retreat without a disgraceful confession of imposture. In part, the conduct of the poor Samuels was affecting, and even high-minded. After lengthened worrying, the accusers got Dame Samuel indirectly to confess her guilt, by making her repeat a prescribed charm, which had the effect of at once bringing the children out of their fits. But the old man and the daughter steadily maintained their innocence. The unfortunate family were condemned on the 4th April, 1593, and soon after executed.

When James I. ascended the English throne, he unfortunately conceived it to be his duty immediately to illuminate the southerns on the subject of witchcraft. An act of the first year of his reign defines the crime with a degree of minuteness worthy of the adept from whose pen it undoubtedly proceeded. "Any one that shall use, practise, or exercise any invocation of any evil or wicked spirit, or consult or covenant with, entertain or employ, feed or reward, any evil or wicked spirit, *to or for* ANY *purpose*; or take up any dead man, &c. &c. &c.; such offenders, duly and lawfully convicted and attainted, shall suffer death." We have here witchcraft first distinctly made, of itself, a *capital* crime. Many years had not passed away after the passing of this statute, ere the delusion, which had heretofore committed but occasional and local mischief, became an epidemical frenzy, devastating every corner of England. Leaving out of sight single executions, we find such wholesale murders as the following in abundance on the record. In 1612, twelve persons were condemned at once at Lancaster, and many more in 1613, when the whole kingdom rang with the fame of the "Lancashire witches;" in 1622, six at York, in 1634, seventeen in Lancashire; in 1644, sixteen at Yarmouth; in 1645, fifteen at Chelmsford; and in 1645 and 1646, sixty persons perished in Suffolk, and nearly

an equal number, at the same time, in Huntingdon. These are but a few selected cases. The poor creatures, who usually composed these ill-fated bands, are thus described by an able observer:—"An old woman with a wrinkled face, a furred brow, a hairy lip, a gobber tooth, a squint eye, a squeaking voice, or a scolding tongue, having a ragged coat on her back, a spindle in her hand, and a dog by her side—a wretched, infirm, and impotent creature, pelted and persecuted by all the neighbourhood, because the farmer's cart had stuck in the gateway, or some idle boy had pretended to split needles and pins for the sake of a holiday from school or work"—such were the poor unfortunates selected to undergo the last tests and tortures sanctioned by the laws, and which tests were of a nature so severe that no one would have dreamed of inflicting them on the vilest of murderers. They were administered by a class of wretches, who, with one Matthew Hopkins at their head, sprung up in England in the middle of the seventeenth century, and took the professional name of *witch-finders*. The practices of the monster Hopkins, who with his assistants moved from place to place in the regular and authorized pursuit of his trade, will give a full idea of the tests referred to, as well as of the horrible fruits of the witchcraft frenzy in general. From each town which he visited, Hopkins exacted the stated fee of twenty shillings, and, in consideration thereof, he cleared the locality of all suspected persons, bringing them to confession and the stake in the following manner:—He stripped them naked, shaved them, and thrust pins into their bodies to discover the witch's mark; he wrapped them in sheets with the great toes and thumbs tied together, and dragged them through ponds or rivers, when, if they sunk, it was held as a sign that the baptismal element did not reject them, and they were cleared—but if they floated (as they usually would do for a time), they were then set down as guilty, and doomed; he kept them fasting and awake, and sometimes incessantly walking, for twenty-four or forty-eight hours, as an inducement to confession; and, in short, practised on the accused such abominable cruelties that they were glad to escape from life by confession. If a witch could not shed tears at command (said the further items of this wretch's creed), or if she hesitated at a single word in repeating the Lord's Prayer, she was in league with the evil one. The results of these and such like tests were actually and universally admitted as evidence by the administrators of the law, who, acting upon them, condemned all such as had the amazing constancy to hold out against the tortures inflicted. Few gave the courts that trouble. Butler has described Hopkins in his Hudibras, as one

> "Fully empower'd to treat about
> Finding revolted witches out.
> And has he not within this year
> Hang'd *three score* of them in *one* shire?
> Some only for *not* being drown'd;
> And some for sitting above ground."

After he had murdered hundreds, and pursued his trade for many years (from 1644 downwards), the tide of popular opinion finally turned against Hopkins, and he was subjected, by a party of indignant experimenters, to his own favourite test of swimming. It is said that he escaped with life, but, from that time forth, he was never heard of again.

The era of the Long Parliament was that, perhaps, which witnessed the greatest number of executions for witchcraft. *Three thousand persons* are said to have perished during the continuance of the sittings of that body, by legal executions, independently of summary deaths at the hands of the mob. Witch-executions, however, were continued with nearly equal frequency long afterwards. One noted case occurred in 1664, when the enlightened and just Sir Matthew Hale tried and condemned two women, Amy Dunny and Rose Callender, at Saint Edmondsbury, for bewitching children and other similar offences. Some of the items of the charge may be mentioned. Being capriciously refused some herrings, which they desired to purchase, the two old women expressed themselves in impatient language, and a child of the herring-dealer soon after fell ill—in consequence. A carter drove his wagon against the cottage of Amy Dunny, and drew from her some not unnatural objurgations; immediately after which, the vehicle of the man stuck fast in a gate, without its wheels being impeded by either of the *posts*, and the unfortunate Amy was credited with the accidents. Such accusations formed the burden of the ditty, in addition to the bewitching of the children. These young accusers were produced in court, and, on being touched by the old women, fell into fits. But, on their eyes being covered, they were thrown into the same convulsions by *other* parties, precisely in the same way. In the face of this palpable proof of imposture, and despite the general absurdity of the charges, Sir Matthew Hale committed Amy Dunny and Rose Callender to the tender mercies of the hangman. It is stated that the opinion of the learned Sir Thomas Browne, who was accidentally present, had great weight against the prisoners. He declared his belief that the children were truly bewitched, and supported the possibility of such possessions by long and learned arguments, theological and metaphysical. Yet Sir Matthew Hale was one of the wisest and best men of his time, and Sir Thomas Browne had written an able work in exposition of Popular Fallacies!

This case occurred in 1664. For some subsequent years trials and executions were yet far from unusual. Chief-Justice North and Holt, to their lasting credit, were the first individuals occupying the high places of the law, who had at once the good sense and the courage to set their faces against the continuance of this destructive delusion. In one case, by detecting a piece of gross imposture, Chief-Justice North threw into disrepute, once and for all, the trick of *pin-vomiting*, one of the most striking and convincing practices of the possessed. A male sorcerer stood at the bar, and his supposed victim was in court, vomiting pins in profusion. These pins were straight, a circumstance which made the greater impression, as those commonly ejected in such cases were bent, engendering frequently the suspicion of their having been previously and purposely placed in the mouth. The chief-justice was led to suspect something in this case by certain movements of the bewitched woman, and, by closely cross-questioning one of her own witnesses, he brought it fully out that the woman placed pins in her stomacher, and, by a dexterous dropping of her head in her simulated fits, picked up the articles for each successive ejection. The man was found guiltless. The acquittal called forth such pointed benedictions on the judge from a very old woman present, that he was induced to ask the cause. "Oh, my lord," said she, "twenty years ago they would have hanged me for a witch if they could, and now, but for your lordship, they would have murdered my innocent son."

The detected imposture in this case saved the accused. It was under Holt's justiceship, however, that the first acquittal is supposed to have taken place, in *despite* of all evidence, and upon the fair ground of the general absurdity of such a charge. In the case of Mother Munrings, tried in 1694, the unfortunate pannel would assuredly have perished, had not Chief Justice Holt summed up in a tone so decidedly adverse to the prosecution, that the verdict of Not Guilty was called forth from the jury. In about ten other trials before Holt, between the years 1694 and 1701, the result was the same, through the same influences. It must be remembered, however, that these were merely noted cases, in which the parties withstood all preliminary inducements to confession, and came to the bar with the plea of not guilty. About the same period, that is, during the latter

years of the seventeenth century, summary executions were still common, in consequence of confessions extracted after the Hopkins fashion, yet too much in favour with the lower classes. The acquittals mentioned only prove that the regular ministers of the law were growing too enlightened to countenance such barbarities. Cases of possession, too, were latterly overlooked by the law, which would have brought the parties concerned to a speedy end in earlier days, even though they had done no injury to other people, and were simply unfortunate enough to have made compacts with the demon for the attainment of some purely personal advantages. For example, in 1689, there occurred the famous case of a youth, named Richard Dugdale, who sacrificed himself to the devil, on condition of being made the *best dancer* in Lancashire. The dissenting clergy took this youth under their charge, and a committee of them fasted and prayed, publicly and almost incessantly, for a whole year, in order to expel the dancing demon. The idea of this impostor leaping for a twelvemonth, and playing fantastic tricks before these grave divines, is extremely ludicrous. But the divines played tricks not less fantastic. They became so contemptuously intimate with the demon, as to mock him on account of saltatory deficiencies. A portion of their addresses to him on this score has been preserved, but of too ridiculous a nature for quotation in these pages. If any thing else than a mere impostor, it is probable that Dugdale was affected with St. Vitus's Dance: and this is the more likely, as a regular physician brought his dancing to a close after all. But the divines took care to claim the merit of the cure.

After the time of Holt, the ministers of the law went a step further in their course of improvement, and spared the accused in spite of condemnatory *verdicts*. In 1711, Chief-Justice Powell presided at a trial where an old woman was pronounced guilty. The judge, who had sneered openly at the whole proceedings, asked the jury if they found the woman "guilty upon the indictment of conversing with the devil in the shape of a cat?" The reply was, "We do find her guilty of that;" but the question of the judge produced its intended effect in casting ridicule on the whole charge, and the woman was pardoned. An able writer in the Foreign Quarterly Review remarks, after noticing this case, "yet frightful to think, after all this, in 1716, Mrs. Hicks, and her daughter, aged *nine*, were hanged at Huntingdon for selling their souls to the devil, and raising a storm by pulling off their stockings, and making a lather of soap! With this crowning atrocity, the catalogue of murders in England closes." And a long catalogue, and a black catalogue it was. "Barrington, in his observations on the statute of Henry VI., does not hesitate to estimate the numbers of those put to death in England, on this charge, at THIRTY THOUSAND!"

We have now glanced at the chief features in the history of witchcraft in England, from the enactment of the penal statutes against it. These statutes were not finally abolished till the middle of the eighteenth century, and unhappy consequences followed, in various instances, from their being left unrepealed. Though among the enlightened classes the belief in witchcraft no longer existed, the populace, in town and country, still held by the superstitions of their forefathers, and, having the countenance of the statute-book, persecuted the unfortunate beings whose position and circumstances laid them open to the suspicion of sorcery. The ban of public opinion told severely enough upon the comforts of such poor creatures, but the rabble occasionally carried their cruel and ignorant oppressions to a greater length. On the 30th of July, 1751, an aged pauper named Osborne, and his wife, were seized by a mob in Staffordshire, dragged through pools, and otherwise so vilely misused, that the woman died under the hands of her assailants. The attention of the law, and the indignation of the humane, were aroused. One man, who had taken a prominent share in the brutal outrage, was condemned on trial and executed. Immediately afterwards, the penal statutes against witchcraft were abrogated by the legislature, and the remembrance of them only remains, as a wonder and a warning to the posterity of those who practised and suffered from them, as well as to mankind at large.

It must not be imagined, we may observe in conclusion, that the present generation has no need of such a warning, or is relieved by its increased enlightenment from all chance of falling into similar errors. The nineteenth century has witnessed such impostors as Johanna Southcote, Matthews, and Thom, and has seen a degree of enthusiastic and unhesitating credence given to their pretensions by many persons moving in a most respectable rank in society, which shows that the credulous spirit that created and supported witchcraft is not by any means extinguished. It is indeed a spirit only to be fully eradicated by such a universality of education and intelligence as can scarcely be expected to exist, excepting after the lapse of long-coming centuries of improvement. The subject which has been treated of here has therefore a moral. In brief words, the world may learn from it the peril of encouraging the idea of the possibility of direct spiritual influences and communications in these latter days—a thing discountenanced alike by the lights of reason and scripture.

SPECTRAL ILLUSIONS.

The subject of spectral illusions, or, to use the common phraseology, apparitions or spectres, is now, in the estimation of scientific and properly informed men, one of the simplest and most intelligible to which the mind can be directed; while, to the ignorant, it still appears full of doubt and mystery. An apparition, spectre, ghost, or whatever it may be called, is vulgarly supposed to be a supernatural appearance—a thing occurring out of the common order of nature. No particular time or place is assigned for the appearance; but we may observe that the time is usually evening or night, and the place solitary or apart from the busy haunts of man. According to old theories on the subject, the person who declared that he had seen such an appearance was either set down as the fabricator of an untruth, or his story was fondly believed, and in the latter case the supernatural incident was added to the mass of credible history. We shall now endeavour to set this conflict of testimony and opinion to rights. In all cases, it is quite possible for the declarant to speak the truth as respects what he saw, or thought he saw, and yet that no real apparition may have occurred. The whole affair, as we shall explain, is simply a mental delusion, caused by some species of disease in the organs which affected the vision.

Mental and bodily disorder, organic or functional, is now allowed by physicians to be the basis of all kinds of spectral illusion. Organic disorder of the body is that condition in which one or more organs are altered in structure by disease. Disease of the brain, which involves organic mental disorder, is properly disease of the body, but enduring lunacy or fatuity, existing (if they can do so) without disease in the structure of the brain, may also be called organic disorder of the mind. These explanations will show what is meant by that epithet, as applied either to affections of the mind or body. Functional disorder, again, of the mind or body, is that condition of things where the healthy action of the organ or organs, in part or whole, is impeded, without the existence of any disease of structure. It may be said that violent excitement of the imagination or passions constitutes functional mental disorder; "anger is a temporary madness," said the Romans wisely. As for functional bodily disorder, temporary affections of the digestive organs may be pointed to as common cases of

such a species of physical derangement. All these disorders, and kinds of disorders, may appear in a complicated form, and, what is of most importance to our present argument, the *nervous system*, on which depends the action of the *senses*, the power of *volition*, and the operation of all the involuntary functions (such as the circulative and digestive functions), is, and must necessarily be, involved more or less deeply in all cases of constitutional disorder, organic or functional. These powers of the nerves, which form the sole medium by which mind and body act and react on each other, give us a clue to the comprehension of those strange phenomena called spectral illusions, which depend on a combination of mental and physical impressions.

Organic mental disorder generates spectral illusions. Almost every lunatic tells you that he sees them and with truth; they are seemingly present to his diseased perceptions. The same cause, simple insanity, partial or otherwise, and existing either with or without structural brain disease, has been, we truly believe, at the foundation of many more apparition-cases than any other cause. By far the greatest number of such cases ever put on record, have been connected with fanaticism in religious matters; and can there be a doubt that the majority of the poor creatures, men and women, who habitually subjected themselves, in the early centuries of the church, to macerations and lacerations, and saw signs and visions, were simply persons of partially deranged intellect? St. Theresa, who lay entranced for whole days, and who, in the fervour of devotion, imagined that she was frequently addressed by the voice of God, and that our Saviour, St. Peter, and St. Paul, would often in person visit her solitude, is an example of this order of monomaniacs. That this individual, and others like her, should have been perfectly sensible on all other points, is a phenomena in the pathology of mind too common to cause any wonder. We could ascribe, we repeat, a large class of apparition-cases, including these devotional ones, to simple mental derangement. The eye in such instances may take in a correct *impression* of external objects, but this is not all that is wanting. A correct *perception by the mind* is essential to healthy and natural vision, and this perception the deranged intellect cannot effect. A three-footed stool may then become a kneeling angel. We would therefore have such persons regarded, not in the uncharitable light of impostors, but of poor creatures who mistook natural hallucinations for supernatural.

Undoubtedly, however, many of those cases of spectral illusions, which have made the deepest impression on mankind, have not arisen from organic mental disease on the part of the sight-seers. The lunatic is apt to betray his condition, and, that once recognised, his visions become of no weight. We have then to turn to other causes of spectre-seeing; and, first, let us notice the mode of operation, and effects of certain *functional* disorders of the system, operating on the visual perceptions through the nerves. A bodily disorder, which ought in itself to afford a solution of all apparitions, is that called *delirium tremens*. This is most commonly induced, in otherwise healthy subjects, by continued dissipation. So long (say medical authorities) as the drinker can take food, he is comparatively secure against the disease, but when his stomach rejects common nourishment, and he persists in taking stimulants, the effects are for the most part speedily visible, at least in peculiarly nervous constitutions. The first symptom is commonly a slight impairment of the healthy powers of the senses of hearing and seeing. A ringing in the ears probably takes place; then any common noise, such as the rattle of a cart on the street, assumes to the hearing a particular sound, and arranges itself into a certain tune perhaps, or certain words, which haunt the sufferer, and are by and by rung into his ears on the recurrence of *every* noise. The proverb, "as the fool thinks, so the bell tinks," becomes very applicable in his case. His sense of seeing, in the meanwhile, begins to show equal disorder; figures float before him perpetually when his eyes are closed at night. By day, also, objects seem to move before him that are really stationary. The senses of touch, taste, and smell, are also involved in confusion. In this way the disturbance of the senses goes on, increasing always with the disorder of the alimentary functions, until the unhappy drinker is at last visited, most probably in the twilight, by visionary figures, distinct in outline as living beings, and which seem to speak to him with the voice of life. At first he mistakes them for realities, but, soon discovering his error, is thrown into the deepest alarm. If he has the courage to approach and examine any one of the illusory figures, he probably finds that some fold of drapery, or some shadow, has been the object converted by his diseased sense into the apparition, and he may also find that the voice was but some simple household sound converted by his disordered ear into strange speech; for the senses, at least in the milder cases of this sort, rather *convert* than *create*, though the metamorphosed may differ widely from the real substance. The visitations and sufferings of the party may go on increasing, till he takes courage to speak to the physician, who by great care restores his alimentary organs to a state of health, and, in consequence, the visions slowly leave him. If, however, remedies are not applied in time, the party will probably sink under the influence of this disorder. The spectral figures and voices, being solely and entirely the creation of his own fancy, will seem to do or say any thing that may be uppermost in that fancy at the moment, and will encourage him to self-murder by every possible argument—all emanating, of course, from his own brain. The whole consists merely of his *own fancies bodied forth to him visibly and audibly*. His own poor head is the seat of all; there is nothing apart from him—nothing but vacancy.

Dr. Alderson, a respectable physician, mentions his being called to a keeper of a public-house, who was in a state of great terror, and who described himself as having been haunted for some time with spectres. He had first noticed something to be wrong with him on being laughed at by a little girl for desiring her to lift some oyster shells from the floor. He himself stooped, but found none. Soon after, in the twilight, he saw a soldier enter the house, and, not liking his manner, desired him to go away; but receiving no answer, he sprang forward to seize the intruder, and to his horror found the shape to be but a phantom! The visitations increased by night and by day, till he could not distinguish real customers from imaginary ones, so definite and distinct were the latter in outline. Sometimes they took the forms of living friends, and sometimes of people long dead. Dr. Alderson resorted to a course of treatment which restored the strength of the digestive organs, and gradually banished the spectres. At the close of the account, it is said that the man emphatically expressed himself to have now received "a perfect knowledge of the nature of ghosts."

Many additional cases from Hibbert, Abercromby, and other writers might be quoted, in which the visual impressions and perceptions were in a similar way affected by the influence of digestive derangement. But as no doubt can rationally exist on the point, from the comparative commonness of the disease, no more proof need be brought forward. However, the inference naturally deducible from these facts is too important to be overlooked. Here we find, by unquestionable medical evidence, that a man walking about in apparent bodily health, and mentally sane, may nevertheless be subject to most distinct visitations of spectral figures, some of them in the semblance of *dead* persons. We find this, we repeat, to be within the range of natural phenomena. Now, is it not more likely, in those cases where wonderful apparitions are reported to have been seen, that the

whole was referable to such natural causes, than that the grave gave up its dead, or that the laws of the universe were specially broken in upon in any other way? Even with only one such admitted source of spectral illusions as the malady alluded to, we should certainly err in passing it by to seek for explanations in supernatural quarters. But in reality we have *many* causes or sources of them, and to these we shall now look, in continuation of our argument.

Among the other varieties of bodily ailments affecting either structure or function, which have been found to produce spectral illusions, fevers, inflammatory affections, epileptic attacks, hysteria, and disorders of the nerves generally, are the most prominent. As regards fevers and inflammatory affections, particularly those of the brain, it is well known to almost every mother or member of a large family, that scarcely any severe case can occur without illusions of the sight to a greater or less extent. In hysteric and epileptic cases, also, where fits or partial trances occur, the same phenomena are frequently observed. But we shall not enlarge on the effects produced by the influence of severe and obviously existing maladies, as it is in those cases only where the spectre-seer has exhibited *apparent* sanity of mind and body, that special wonder has been excited. It is so far of great importance, however, to notice that these diseases do produce the illusions, as in most cases it will be found on inquiry that the party subject to them, however sound to appearance at the time, *afterwards* displayed some of these complaints in full force; and we may then rationally explain the whole matter by supposing the seeds of the ailments to have early existed in a latent state. A German lady, of excellent talents and high character, published an account some years back of successive visions with which she had been honoured, as she believed, by Divine favour. Dr. Crichton, however, author of an able work on Insanity, found that the lady was always affected with the *aura epileptica* during the prevalence of the illusions; or, in other words, that she was labouring under slight attacks of epilepsy. Thus simply was explained a series of phenomena which, from the high character for veracity of the subject of them, astonished a great part of Germany. Another case, where functional bodily disorder of a different and very simple kind was present in an unrecognisable state, and produced extraordinary illusions, was the famous one of Nicolai, the Berlin bookseller. This individual, when in perfectly fit state to attend to his ordinary business, was suddenly visited one day, when casually excited by some annoying circumstance, by the figure of a person long dead. He asked his wife, who was present, if she saw it; she did not. The bookseller was at first much alarmed, but, being a man of sense and intelligence, he soon became convinced of the illusory yet natural character of the spectra, which subsequently, for a period of two whole years, appeared to him in great numbers and with daily frequency. "I generally saw (says he) human forms of both sexes, but they took not the smallest notice of each other, moving as in a market-place, where all are eager to press through the crowd; at times, however, they seemed to be transacting business with one another. I also saw several times people on horseback, dogs, and birds. All these phantasms appeared to me in their natural size, and as distinct as if alive; none of the figures appeared particularly terrible, comical, or disgusting, most of them being of an indifferent shape, and some presenting a pleasing aspect. The longer these phantoms continued to visit me, the more frequently did they return." They also spoke to him repeatedly.

These phantasms lasted, as we have said, two years. The issue is peculiarly worthy of note. Nicolai had in former years fallen into the habit of periodical bloodletting by leeches, but had ventured to stop the practice previous to the accession of phantoms, and during their prevalence he had only been advised to attend to the state of his digestive organs. After they had endured for the time mentioned, it was thought fit to renew the blood-letting. At eleven in the morning, while the room was crowded with the spectral figures, the leeches were applied. As the bleeding slowly proceeded, the figures grew dimmer and dimmer, and finally, by eight o'clock in the evening, they had all melted into thin air, never to re-appear! This most remarkable case, the first in which any individual dared calmly to come forward and avow such an affection, at the risk of incurring the charge of insanity, was founded, we thus see, simply on a plethoric or surcharged state of the blood-vessels. Nicolai deserves great credit for the philosophic composure with which he recorded the phenomena presented to him; but his statement, which has often been republished in this country, seems defective in some points, and, from the interest of the subject, we may be pardoned for presuming to notice these. Generally speaking he represents his spectral visitants as things which came and went, and assumed various shapes, and appeared in certain numbers, *uninfluenced* directly *by himself*. The total dependence which they had upon his own fancy of the *moment*, is not put clearly before us, though, by the truthful accuracy of the narrative, he unconsciously makes that fact apparent every instant. The surcharged state of the vessels was the fundamental cause of the phantasms, but his own passing fancies moulded them for the passing moment into shape, regulated their numbers and gave them words. How could it be otherwise? The whole panorama was exhibited on his own retina, and the working brain behind was the manager and scene-shifter of the show.

Second-Sight.—Second-Sight, taking the word in its common acceptation of supernatural sight-seeing, is one of the varieties of spectral illusion. Certain mental functions becoming diseased, the sense of sight is imposed upon by the appearance of things which are purely imaginary, but nevertheless supposed to be prophetic of future events. Idleness, solitude, insufficient diet, and an imagination led astray by ruminating too intensely on the causes of human weal and wo, may be assigned as the prevailing causes of the disease. The Lowland Scotch used occasionally to see *wraiths*, or spectral appearances of persons who were soon to quit this mortal scene; the Irish were also accustomed to the spectacle of *fetches*; and the Highlanders had their *second-sight*—the whole, be it observed, being but a variety of the same mental disease and delusion.

Second-sight, however, has formed the subject of a more regular profession than any other species of spectral frenzy. There were persons, who, possessing from infancy a defective mental constitution, or having a taste for imposture, gave themselves out as habitual sight-seers, and were reverenced accordingly by their unsophisticated neighbours. According to the credulous account of second-sight, the power of the seer is a natural endowment, and cannot be acquired by communication, or in any other way. It is usually talked of by its possessors as a painful and troublesome gift, and one which they would gladly be rid of, if they could. Its vaticinations relate only to things to come, and not to past events. Young and old may alike possess the second-sight, and it is common, also, to men and women. The visions are sometimes predictive of good, and sometimes of evil. Occasionally, the vision simply gives in different tidings.

These are a few of the most common peculiarities attendant on this faculty. There are likewise numberless rules affecting its exercise, and the interpretation of its visions. If a vision occur by day, for example, the accomplishment of what it is supposed to predict will be speedy; if by night, less so. An exact proportion, indeed, is maintained in this respect—the morning vi

being sooner fulfilled than that of noon; the latter more quickly than that of the afternoon; and so on. If the seer beholds a figure in a shroud, it is considered a sure sign of death to the party represented by the figure; and, according to the extent to which the shroud covers the body, the end will be quicker or slower. If a woman be seen at a man's left hand, it is a presage that she will be his wife, and this will be the case (say the true believers), though even both should then be married. If more than one woman be seen standing at a man's left hand, they will be married to him in rotation, as they stand nearer or farther from his arm. A seer often announces that such and such a guest will arrive at a certain hour, and, though a hundred miles away, the guest, it is said, will appear at the stated time. If a seer observe a vision of trees and crops in some spot or another, though perfectly barren and bare at the moment, wood and grain will, it is believed, there be seen in due time. A visionary house is beheld by the gifted eye, in a place where stone and lime were never laid, or expected to be laid. Yet there will the real house forthwith be seen. To see a seat, as if vacant when one is setting it, is a presage of the party's death. The seer may behold crowds of people, or single individuals, and very frequently he meets imaginary funeral parties, and determines the coming decease by the apparent mourners.

These rules of vaticination are *said to be* unvarying. No ordinary person sees the vision while it is present to the seer, but the same vision often appears to two or more of the gifted, either while they are together or apart. The Highlanders believe that children and the lower animals, such as cows and horses, behold the appearances while they are before the seer. This is made plain, they say, in the case of the animals, by the trembling which seizes them at the moment; and frequently the children will cry, and, if asked the reason, will tell what unusual thing they behold or have beheld. It is almost needless to say, that the stories told to prove the truth of these notions, rest on no sure foundation, and that, at the best, the prophecies of the sight-seer only come to pass by chance.

Atmospheric Illusions.—Spectral or illusory appearances also take place from the power of refraction in the atmosphere. In certain conditions of the atmosphere, things at a distance, and really out of sight, as on the opposite side of a hill from the spectator, are represented in mid-air; but there is nothing supernatural in this—the whole is the effect of a simple cause. The following is an example of atmospheric illusion:—A gentleman and his servant in the year 1744, beheld a troop of cavalry riding and performing various military evolutions on the side of Souter (or Soutra) Hill, in a spot so precipitous as to render it absolutely impossible for man or beast to maintain a footing. The servant had in the previous year observed a single horseman hunting in nearly the same place, and had then come to the conclusion that the sight was illusory, it being impossible for a rider to cross a perpendicular precipice at speed. The troop of cavalry, therefore, was at once set down as an atmospheric deception, and numbers of persons of the district came to look on the extraordinary scene, which continued visible till nightfall. An explanation of the circumstance was afforded by the rebellion of the following year. Some party of rebels were most probably exercising in secret, in a spot where the evening sun so caught their figures as to reflect them on the acclivity of Souter Hill. The legend of the spectre of the Brocken, in Germany, in like manner arises from the fact of the ground being favourable to the reflection of a visiter's figure against the evening sky. Our ancestors were occasionally alarmed with visions of armies fighting in the air, and similar illusions; had they been acquainted with the laws of atmospheric refraction, all would have appeared simple natural phenomena, having no relation to any future event, good or evil.

Dreams.—It has now been seen that there are various modes in which the system may be so disturbed as to produce spectral illusions, and that, in the majority of these cases, the parties subject to them might seem to be not only of sound mind, but in perfect bodily health. Another mode of explaining cases of this description may now be pointed out. Many of the apparitions which have been vouched for by those subjected to them, have certainly been neither more nor less than *vivid dreams*. A dream is a slight and ill-arranged action of the thinking faculties during a state of partial sleep; in other words, when we dream we are only thinking in a partially wakened state. The dream or the thought is in all cases but a momentary impression, perfectly natural in its operation; the state of mind which causes it being produced by temporary functional derangement; the stomach is usually less or more out of order. No dreams take place during sound sleep. In the greater number of instances, the half-awakened mind embarrasses itself with shreds of recollections of things formerly seen or thought of, and dressing these up in a new and fantastic form, a kind of drama is performed, having the semblance of reality. A servant girl living in a family where there were some phrenological busts, and, among others, a conspicuous one of Curran, awoke her bed companion one morning with the alarming information that the ghost of Curran stood at the foot of the bed dressed in a sailor's jacket, and having on his pale face the unwonted and unbustlike ornament of an immense pair of black whiskers. The other servant could see nothing, though the apparition seemed to her companion to remain visible for some minutes. On the tale being told, a pretty strong light was thrown on the matter. The master of the house had a yacht, and its sailors at that period were frequently about the premises. Going to bed much fatigued, and having her dreaming thoughts divided between her household duties and some gay whiskered beau of the yacht, the girl's fancy had dressed up Curran's bust, an object most familiar to her retina, in the way mentioned, giving him the sailor's person and whiskers as a fitting appendage. Had the object called up to the eye in this case, instead of being a bust of Curran, chanced to be a portrait of some wicked ancestor or ancestress of the family, as might easily have occurred from the greater comparative impression made on the mind by portraits of that cast, then should we have had a splendid instance of the preternatural appearance of a spirit stung by remorse, and haunting restlessly the scene of its mortal guilt. The girl, without imposture, might have conscientiously reiterated her conviction of the reality of the vision, and the possession of a haunted chamber would have most certainly been assigned to the mansion, inspiring such terror that renewals of the illusion might really have taken place in consequence. Where the whole affair is not a fiction in such haunted-chamber cases, some solution of this kind may be with certainty applied. The practice of believing that dreams are indicative or symbolic of coming events, is one of the silliest superstitions, and is now very properly ridiculed by every rational mind.

MISCELLANEOUS SUPERSTITIONS.

During the seventeenth century, the belief in witchcraft, fairies, apparitions, charms, and every other species of supernatural agency, was universal in Britain, both among high and low, clergy as well as laity. So ill instructed were the people in the art of tracing events to simple natural causes, that there appears to have been a continual liability to ascribe occurrences to the direct influence of good or evil spirits, but particularly to the devil. "Give me leave," says a respectable writer of that age, "here to relate a passage which I received from a person of quality: namely—it was believed, and that not without good cause, that Cromwell, the same morn-

ng that he defeated the king's army at Worcester fight, had conference personally with the devill, with whom he made a contract, that to have his will then, and in all things else for seven years after that time (being the 3d of September, 1651), he should, at the expiration of the said years, have him at his command, to do at his pleasure both with his soul and body. Now, if any one will please to reckon from the 3d of September, 1651, till the 3d of September, 1658, he shall find it to a day just seven years, and no more, at the end whereof he died; but with such extremity of tempestuous weather, that was by all men judged to be prodigious."* Such is a specimen of the egregious fallacies which passed for sound argument among our ancestors.

In Scotland, where religion assumed the garb of gloom and fanaticism, a belief in the personal appearance of devils was universal in the seventeenth century, and continued among the vulgar till within the last fifty years. The narrations of Satan's mean pranks, in assaulting ministers, waylaying travellers, and disturbing families while at worship, would fill a large volume. In the Rev. Mr. Robert Law's "Memorials of Memorable Things, from 1638 to 1684,"† we find the following entry:—

"October, 1670.—There was a devill that troubled a house in Keppoch, within a mile of Glasgow, for the matter of eight days tyme (but disappeared again), in casting pots, and droping stones from the roof, yet not hurting any, like that which appeared in the west, in a weaver's house, a good man, about fourteen yeirs agoe, which did the lyke, and spoke to them audibly." The tricks of the devil here referred to, as having taken place in a weaver's house in the west, about the year 1656, and which were implicitly believed by the most learned clergy of the time, are related at great length by Mr. George Sinclair, professor of philosophy in the College of Glasgow, in his work, "Satan's Invisible World Discovered." The alleged events occurred at Glenluce, in Wigtonshire, and would be too contemptible for quotation, if it were not desirable to show what paltry tricks were played off, and believed to be supernatural in those days. The family of the weaver, being vexed with noises and appearances, send for the neighbouring clergyman to allay the devil, between whom and the worthy man a dialogue takes place, from which we extract a few passages:—"The minister returned back a little, and standing upon the floor, the devil said, 'I knew not these scriptures till my father taught me them.' Then the minister conjured him to tell whence he was. The foul fiend replied, 'That he was an evil spirit come from the bottomless pit of hell to vex this house, and that Satan was his father.' And presently there appeared a naked hand, and an arm from the elbow down, beating upon the floor till the house did shake again, and also he uttered a most fearful and loud cry, saying, 'Come up, my father—come up. I will send my father among you; see, there he is behind your backs!' Then the minister said, 'I saw, indeed, a hand and an arm, when the stroke was given, and heard.' The devil said to him, 'Saw you that! It was not my hand, it was my father's; my hand is more black in the loof (palm). Would you see me,' says the foul thief, 'put out the candle, and I shall come but the house (into the outer room) among you like fireballs,'" &c. The visit of the minister was unavailing. "About this time the devil began with new assaults; and taking the ready meat which was in the house, did sometimes hide it in holes by the door-posts, and at other times hid it under the beds, and sometimes among the bed-clothes and under the linens, and at last did carry it quite away, till nothing was left there save bread and water. The goodwife, one morning making porridge for the children's breakfast, had the wooden plate, wherein the meal lay, snatched from her quickly. 'Well,' says she, 'let me have my plate again.' Whereupon it came flying at her, without any skaith done." Any further extract from this ridiculous, though at one time universally believed, narrative, would be unnecessary. A modern police-officer would have effectually relieved "the afflicted family," by instantly discovering the performer of the tricks, and taking him into custody.

Besides the belief in aërial and terrestrial spirits, our credulous ancestors put faith in all kinds of romancing stories of river and sea demons. The more prevalent of these superstitious notions was a belief in mermaids and mermen, a class of creatures who lived in the sea, and had bodies half-human, half-fish. Mermaids appear to have been much more common than mermen. The mermaid, we are told, possessed the body, from the middle upwards, of a beautiful female, with a head flowing with long yellow hair, which she incessantly combed with one hand, while she held a small mirror with the other. This female monster of the deep is described as having been a constant schemer of destruction to confiding navigators, or those who haunted unfrequented parts of the sea-shores.

Another of the vulgar superstitions of our ancestors was a belief common to nations of Germanic origin, that the corpse of a murdered person would bleed on being touched by the person who was guilty of the murder. Strange to say, this species of evidence of guilt was at one time admitted in the Scottish criminal courts. The following incredible instance was communicated to Sir Walter Scott, and is given in his Minstrelsy of the Scottish Border (vol. ii. p. 54). "Two young men, going a-fishing in the River Yarrow, fell out, and so high ran the quarrel, that the one, in a passion, stabbed the other to the heart. Astonished at the rash act, he hesitated whether to fly, give himself up to justice, or conceal the crime; and in the end, fixed on the latter expedient, burying the body of his friend very deep in the sands. As the meeting had been accidental, he was never suspected, although a visible change was observed in his behaviour, from gayety to a settled melancholy. Time passed on for the space of fifty years, when a smith, fishing near the same place, discovered an uncommon and curious bone, which he put in his pocket, and afterwards showed to some people in his smithy. The murderer being present now an old white-headed man, leaning on his staff, desired a sight of the little bone; but how horrible was the issue!—no sooner had he touched it, than it streamed with purple blood. Being told where it was found, he confessed the crime, was condemned, but was prevented by death from suffering the punishment due to his crime." We need only add, that no evidence is given of the truth of this improbable tale, and it is utterly unworthy of belief.

Ignorance has often been justly termed the mother of superstition; wherever mankind are most ignorant, or least accustomed to trace events to their natural and proximate causes, there do all kinds of superstitious notions luxuriantly flourish. When the mind once allows that matters of ordinary occurrence may take place by the interference of invisible agents, such as spirits, apparitions, devils, and so forth, there is obviously no limit to the actions they are supposed to perform. Hence the number of events believed to be ominous of evil in unenlightened society. The appearance of two or three magpies, the spilling of salt at table, the cracking of furniture, the howling of dogs, putting on the left shoe first, the ticking noise of an insect in rotten wood (death-watch), and a hundred other trifling occurrences, are imagined to be harbingers of evil. It is distressing to find, that notwithstanding the great advances of intelligence, a large portion of the people are still affected by the most absurd minor superstitions; for example, believing in the influence of charms, with as true a devotion to error as signalized

* Walker's History of Independency.

† Edited by C. Kirkpatrick Sharpe, from the MS. Edinburgh 1818.

our ancestors of the seventeenth century. The following instance of this species of credulity, given in a Norwich newspaper, April, 1840, was mentioned as having lately occurred in that city:—"Children who are sickly are taken to a woman for the purpose of being cut for a supposed disease called the *spinnage*. The infants are on a Monday morning taken to this woman, who, for threepence, cuts through the lobe of the ear with a pair of scissors, then makes a cross with the blood upon the forehead and breast of the child. On the following Monday, the same barbarous ceremony is performed upon the left ear; and on the succeeding Monday the right ear is again doomed to undergo the same ceremony. In some cases it is deemed necessary to perform the operation nine times."

The occurrence in 1840 of a fatal disease in cattle, called the *murrain*, and which was susceptible of remedy by proper surgical means, led to the exposure of various superstitious observances among a respectable class of the rural population of England. In Northumberland, a fire kindled by rubbing together two pieces of hard wood, was carried about in an old shoe from one house to another, and thus passed through the country; with this a bonfire was lighted, and the cattle were made to pass through its smoke, which was supposed to render them invulnerable to the attacks of the disease.

In Scotland, cattle are the subject of scarcely less superstitious maxims. In many districts, if a cow has been seized with *phthisis pulmonalis*, or any inflammatory disorder, or if she has become *hide-bound*, or rumination has been accidentally stopped, the wise people called in to minister know but one explication of the mystery: the beast has got the *tail-ill*. This is an imaginary disorder supposed to reside in the tail, and to show itself by eating away the bone of that organ. To prove its presence, the cow-doctor will ask the owner of the animal to feel the tail near its extremity, and satisfy himself that the bone is "clean awa," the fact being that in that region there is only a soft cartilage. Under this miserable delusion, the people make incisions in the tails of cattle, into which they rub salt, soot, or horse turpentine, thus adding to the pains of the animal, without doing the least for the relief of the real malady. Often a considerable portion of the tail is cut off, by way of making the cure more certain. An educated veterinary surgeon of our acquaintance informs us that, in some cow-houses in his neighbourhood, there is not a cow with a tail above sixteen inches long.

One of the most remarkable charms now or very lately in use in Lanarkshire for the cure of illnesses in cattle, is a talisman of great antiquity, still preserved at Lee, a gentleman's house in that county, and popularly known as the *Lee Penny*. The following account of this ancient talisman is given in the Picture of Scotland, by R. Chambers:—

"Simon Locard of Lee accompanied the good Sir James Douglas to Palestine [in the fourteenth century], bearing the heart of King Robert Bruce enclosed in a locked case, on which account his name was changed to Lockhart, and he obtained for his armorial bearings a heart attached to a lock. Engaging in the wars of the Holy Sepulchre, this hero, who, at the death of Douglas in Spain, became the leader of the mission, had the good fortune to make a Saracen of rank his prisoner. The lady of the warrior came to pay his ransom, and was counting out the money, when she happened to drop from her purse a small jewel, which she immediately hastened to pick up with an air of careful solicitude. Lockhart eagerly inquired the nature of the jewel, and learning that it was a medicatory talisman, refused to deliver up his captive, unless it were added to the sum previously stipulated. The lady was obliged to comply, and Simon brought it home to Scotland, where it has ever since continued in the possession of his descendants, perhaps the only existing memorial of the Crusades in this country. It is called the Lee Penny, on account of its being set in the centre of an old English silver coin. Triangular in shape, it measures about the third of an inch each way, and is of a dark red colour, but perfectly transparent. The nature of the stone cannot be determined by lapidaries, being apparently different in all respects from any known in this quarter of the world. To the edge of the coin a small silver chain has been attached, and the whole is deposited in a gold box which the Empress Maria Theresa presented to the father of the late Count Lockhart.

"The Lee Penny did not lose its talismanic property on being transferred to a country of Christians. On the contrary, it has been all along, even till the present day, remarkable for medical virtue. It is especially sovereign in the diseases of horned cattle. The mode of administering it is this:—Holding it by the chain, it is three times plumped down into a quantity of water, and once drawn round—*three dips and a swell*, as the country people express it—and, the cattle or others affected drinking this water, the cure is speedy and effectual. Even at this day, rife as the gospel is now said or supposed to be, people sometimes come from great distances with vessels, which they fill with water charmed in the manner described, and which they take home in order to administer it to their bestial. In the reign of Charles I, the people of Newcastle being affected with the plague, sent for and obtained a loan of the Lee Penny, leaving the sum of £6000 sterling in its place as a pledge. They found it so effectual, or were impressed with so high an opinion of its virtues, that they proposed to keep it, and forfeit the money; but the Laird of Lee would not consent to part with so venerable and so gifted an heir-loom. The laird of that time was a high Cavalier, and one of the charges brought against him by the party whom he had to oppose, was, that he effected cures by means of necromancy. One other remarkable instance of its efficacy is recorded. About the beginning of the last century, Lady Baird of Saughtonhall having been bit by a mad dog, and exhibiting all the symptoms of hydrophobia, her husband obtained a loan of the talisman; and she, having drunk and bathed in water which it had sanctified, got completely better. That this transaction really took place, seems indubitable, for an ancient female member of the Lee family, who died lately, remembered hearing the laird who lent the Penny to Lady Baird, describe how he and his dame had been invited to Saughtonhall, and splendidly entertained, in gratitude for the use of the talisman. Being now visited by an incredible number of persons, whose curiosity has been excited respecting it, Sir Charles M'Donald Lockhart, the present proprietor, has adopted the idea of keeping an album in which their names are recorded. We have all seen the use made of it by the author of Waverley, in his fine chivalric tale, 'the Talisman.'"

We need only add, what is here omitted to be mentioned, that the supposed influence of the Penny, like every similar charm, has been an entire delusion; and that if the cures were performed, as stated, something else than the charm of the talisman must have been the cause. In this, as in all similar traditions, the testimony is defective, every circumstance unfavourable to the superstition being suppressed.

DOMESTIC ECONOMY—COOKERY.

Cookery is an art upon which so much of our daily comfort and health depends, that it is of the highest importance that it be well performed. Every housewife may not be able to procure the finest kinds of food, but every one has it in her power to make the most of that which she does procure. By a certain degree of skill and attention, very humble fare may be dressed in such a manner that it will almost rival the most expensive dishes, both in savouriness and nutritiousness. A good housewife suffers nothing to be lost or spoiled. Mere scraps, which a careless individual would perhaps throw away, are put to a proper use, and, by means of certain auxiliary seasoning, brought to table in a new and attractive guise. Even if little or nothing be absolutely saved by these economical arrangements, the dressing of food in a tasteful manner is a point of some importance. When a dish has a slovenly appearance, is smoked, underdone, or prepared with rancid or unclean seasoning, both the eye and the appetite are offended, which is a serious evil in itself, independently of the injury which may possibly be done to the stomach of the eater. In every respect, therefore, it is consistent with good judgment to prepare food for the table in the most tasteful and agreeable manner.

One of the chief points to be attended to in cookery is *cleanliness*—scrupulous cleanliness in every department of the business of the kitchen. The hands of the cook, in particular, should be always clean; that is, washed every time after doing any kind of work which has soiled them, or before proceeding to handle meat for dressing. She should also be careful in having her hair always neatly trimmed up, so that no loose hairs may drop into the dishes. The next point of regulation is to keep all the saucepans and other utensils perfectly clean in their inner parts, and also in the insides of the lids; carefully washing with hot water, and scouring when necessary. If the cooking utensils are not kept thoroughly clean, they will be very apt to taint the food prepared in them, and will certainly detract from the agreeable taste of the dishes. It is the duty of every housewife, either in her own person or by her deputy, the housekeeper, to see that these and all other rules affecting the cleanliness of the kitchen are attended to by servants, for she is understood to be responsible both for the wholesomeness and the tidy appearance of the dishes presented at table.

Another essential point in cookery is *attention*. Many persons think they have done all that is necessary, when they have fairly commenced or set a going any particular process in cooking. They seem to imagine that they may safely leave a joint to roast by itself, or leave a pot with soup or broth to boil by itself, and that they have only to go back to the fire at a certain time, and they will find the things ready for dishing. Now, this kind of inattention is certain to spoil the best meat ever put to a fire. Some processes require much less attention than others, but none can be properly performed if left long to itself. A good cook is pretty frequent in her visits to the fire, to see how the operation of dressing is going on, and seizes the proper moment in giving her assistance.

Perfection in the art of cookery is only attainable by lengthened experience, and a careful study of the qualities of meats, and the application of sauces and seasonings. It is chiefly in knowing how to make and apply sauces that a cook shows her skill. We therefore recommend this branch of the art to very careful attention.

KITCHEN ARRANGEMENT.

A young and thriftily disposed housewife will, if possible, proceed to market herself, in order to lay in butcher-meat and other fresh provisions for her family. By this plan she will possess two advantages—that of selecting the best pieces, and of getting them at the lowest price. The frequency of her visits to the market will, of course, depend on the number of her family, and their taste as to the staleness or freshness of the meat to be purchased. If circumstances permit, it is advisable to purchase a whole week's provisions at a time, at least the chief things which will be required for the ensuing eight days. We would recommend a housewife to act upon a system in varying the kinds of meat which she buys, not only as they may be suitable to the seasons, but as calculated to promote the health of a family. It is of considerable consequence that food should be varied; indeed, sameness of diet will produce the most injurious effects, whatever be the quality of the food which is taken. Let the housewife, therefore, exercise a little ingenuity and judgment in her marketing expeditions, contriving to present at table a succession of different descriptions of animal and vegetable food; as, for example, sometimes meat roasted, and sometimes boiled or stewed; sometimes fresh meat, and sometimes salted; sometimes butcher-meat, and sometimes fish; and so on, according to taste and other circumstances. It does not necessarily follow, that, in thus varying the bill of fare, greater expense is incurred than if the same kind of articles were continually purchased.

The best meat is that which is moderately fat. If it be lean, or almost free of fat, it is an indication that the animal has been ill fed, and that the meat will prove tough and tasteless. Avoid lean beef—it forms wretched fare, and will be dear at any price. The fat of good beef is slightly yellowish; the fat of good mutton is pure white. The flesh of both beef and mutton should be of a clear red colour. The mutton of black-faced sheep, or Southdowns, is the most tender or sweet, and may be known by the shortness of the shank. Mutton is in perfection at between four and five years, but is seldom to be had older than three years. Cow and bull beef are considerably inferior to ox beef.

In choosing lamb, select that which has a delicate appearance and is perfectly fresh. Young veal has a dark and flabby look, and is tasteless when dressed. Veal is best when the animal is between four and six months old. The flesh is then white and delicate, and is firm in the fibre. Pork should be white and delicate like veal, and thin in the skin. Lamb, veal, pork, and all other young or white meat, should be fresh, and not bought long before being used.

Fowls, ducks, and other feathered animals, should be purchased young, and should be all firm and fleshy to the touch. If the thin bone which projects over the belly feel hard on being handled, the animal is old; if it feel softish, like gristle, the animal is young. This is the safest rule for choosing young feathered animals. The age of game is of little consequence, as it is hung for a considerable length of time before dressing.

All kinds of fish, except salmon, should be purchased as fresh as possible. Freshness in cod, haddock, and generally all fish, is indicated by stiffness in all parts of

the body, and a clear glittering appearance in the scales. Freshness is likewise known by the smell. If there be the least staleness, the fish has an offensive odour. As tricks are sometimes performed with the eyes and gills, freshness of appearance in these is not to be trusted.

It is very difficult to ascertain when eggs are perfectly fresh. There are different rules on the subject, but they are all liable to failure. One mode of judging, is to hold the egg between the eye and the light of a candle, shadowing the eye with the hand; if the appearance is universally luminous without any cloudiness, the egg is fresh; if cloudy or not uniformly luminous, it is probable that the egg is unfit for use.

Butter may be easily selected by the taste and the smell; but in buying both eggs and butter, it is best to deal with a person on whom you can rely, as it is troublesome to be continually seeking out and examining these articles to determine their freshness.

Good ham and bacon have a fresh savoury smell; the fat is white, and free from any yellowness. If it be yellow, reject it, as it will soon become rank and rusty.

Flour for culinary purposes should be new and fresh. Old flour is liable to spoil and become full of animal life, in which condition it is unfit for pastry and other dishes. The best kind of salt for the kitchen is that which is purchased in lumps and cut down.

Keeping Meat.—A larder is a place where fresh meat is kept till it is in a fit state for being cooked, and where cold meat or any other kind of food may be set aside. The larder should be cool and dry, with the outer air playing freely through it. It should also be impervious to vermin or insects, particularly flies. Two or three shelves, and a few strong iron hooks for hanging the meat, are the only furniture.

Beef and mutton are always improved by hanging some time after being killed before they are cooked. The length of time which they may be kept depends on the state of the weather. The best weather for the purpose is when the atmosphere is cool, clear, and dry; in such circumstances, beef and mutton may hang from four to ten days; mutton, if well managed, may hang a fortnight or even three weeks. A moist thick atmosphere is the worst for keeping meat; and when it occurs, great care must be taken with the contents of the larder. The meat should be wiped daily with a cloth, to free it as much as possible from the moisture that gathers upon all meat when kept for many days. In all cases, fresh meat should hang from a hook, and not be laid on a plate.

In most instances, fresh meat is cooked too soon after being killed, a circumstance perhaps arising from the general deficiency of proper larders, and the dread of the meat being spoiled. The consequence is, that, instead of being tender and palatable, the meat is tough and disagreeable, and not so nutritious or so easily digested as it ought to be.

While beef and mutton may with great propriety be kept some days to become tender, veal, lamb, and pork (being young or white meat), will not endure keeping more than a day, or two days at the utmost. Game may be kept for two or three weeks, that which is feathered being kept with the feathers on, and hares being embowelled or paunched. A fowl will keep a week, and a turkey a fortnight. A goose will not keep above nine or ten days. Great care should be taken in picking feathered animals which have been kept, for their skin will in such a case be easily torn.

Keeping Cold Meat.—When newly cooked meat is brought from table, and has to be set aside for after use, put it on a clean dry dish; if any liquor or gravy be left about it, the meat is apt to become sour. The drier and more cool that cold meat is kept, the better. Cold meat is always best when it has not been cut while warm, as in that case the juices have not run out, but remain to enrich the meat.

Keeping Vegetables.—Vegetables of all kinds should be used as soon after gathering as possible. They begin to ferment, and to lose both their flavour and their wholesomeness, very shortly after being taken from the ground. When they have necessarily to be kept for a day or two, place them in a perfectly dry and cool situation, but not exposed to currents of wind. Keep also each kind of vegetable separate from another, to prevent contamination of flavour. They should never be washed or placed in water till immediately before being used.

Kitchen Range.—The most important part of the cooking apparatus is the range or grate. In general, too little care is bestowed by young persons when setting up housekeeping, in making a proper choice of this article. A common error consists in buying ranges which are too large, and which consume a great deal more fuel than is necessary, either for cooking or giving forth heat. One of the chief points in housekeeping, is to cook victuals with the smallest possible quantity of coal. To effect this desirable object, let the range be of a small size, consisting of a fireplace in the centre, large enough for only one vessel, with an oven upon the one side and a boiler on the other; the boiler also going round the back of the fireplace; the top of the whole to be flat. The fire in the grate will thus heat the water in the boiler without any trouble, and will in a great measure render the use of a kitchen kettle unnecessary. The fire will also assist greatly in heating the oven, which at least will at all times heat dinner plates; and if required for baking, a very small quantity of live coal put into the furnace beneath will be sufficient. A range of this description will cost about £4, 10s., will at once roast meat in front, boil water, bake a dish in the oven, though not so well as by a separate or large oven, and keep boiling or simmering at least three vessels on the fire and top of the boiler and oven. Care should be taken to have the range set in such a manner that the smoke from the oven may pass upwards behind to the chimney. By being altogether of iron, this kind of range requires very little building.

The main advantage of such a range is the constant and large supply of hot water which it affords. Every one experienced in family arrangements knows that a *house should never be without hot water*, as it may be wanted at a single moment's notice for various purposes; among others, for hot fomentations, bathing of infants, and so forth. A life may be saved by the ready supply of this article alone.

Boiling and Stewing Vessels.—The choice of these vessels will depend on the taste and judgment of the purchaser. The best kind (called goblets in Scotland, and saucepans in England) are those made of iron, well tinned inside, and these may be had of all sizes. It is convenient to have one or two of the very smallest dimensions, made of block tin, and also to have several to be kept for delicate stews or preparations. It is likewise advantageous to have a few shallow saucepans to be used for stews, or where little liquor is required. Also, one large fish-kettle with a flat drainer to place below the fish in boiling, and for lifting to the dish when done. All the vessels should have tightly-fitting tin or iron covers.

Roasting and other Utensils.—Roasting is always best performed with a twirling hook and bottle-jack. A spit spoils a small piece of meat, and is an instrument which, with the jack that moves it, should never gain an entrance into the kitchen of a family in the lower or middle ranks of life. The bottle-jack, which is in every respect preferable, should be attached to the top of a tin screen of the usual semicircular form. This screen reflects the heat upon the meat, and aids the roasting. Sometimes the screen has the effect of drawing out the

...se from the chimney; when this is the case, have the upper part of the screen taken away, and suspend the jack from a projecting arm or rack on the chimney-piece. This arm, which may be folded back when not used, is made of brass, and may be had for about eighteenpence from any London or other ironmonger. A tin box with an open side, called a Despatch, and resembling a bachelor's oven, is a most useful utensil in a kitchen for baking small puddings or potatoes. Two other main utensils for cooking are a gridiron and frying-pan.

ROASTING MEAT.

Meat is roasted by being exposed to the direct influence of fire. This is done by placing the meat before a fire, and keeping it constantly in motion, to prevent scorching on any particular part. Roasting is generally considered to be the least thrifty mode of dressing meat; but much of the loss may be avoided by care and cleanliness in saving the dripping for other processes of cookery.

Dripping.—Roast beef yields a dripping, which is a valuable article in the economy of the kitchen. It should be removed from the pan beneath the meat before it becomes overheated, or scorched, by the fire, leaving sufficient for basting. Dripping is prepared for future use in the following manner:—As taken hot from the dripping-pan, pour it into boiling water, when all particles of cinder or other improper matter will fall to the bottom, and leave the pure fat on the surface. Collect these cakes of fat, and by heating them in a jar, placed in a saucepan of boiling water, the whole will become a solid mass, and may be thus put aside for use. This process not only purifies dripping, but gives it a clear white colour. A little salt must be infused, to assist in preserving it.

The dripping from mutton, being tallowy, is little used in cookery, and the dripping from most other kinds of meat and poultry is deemed equally valueless. The dripping from lamb may be [illegible] for use in frying fish, or making pie-crust.

To roast Beef.—The best p[illegible]eef for roasting is the sirloin. If the suet be not required, it may be ordered to be cut off before purchasing the joint; a small piece of suet is all that is requisite for the purpose of basting. Do not wash the meat, unless when it is musty, as already directed. Wipe it quite dry, and hang it on the hook of the jack, in the way most advantageous for being operated upon uniformly by the fire. Handle it as little as possible. At first, place it at such a distance from the fire that it may be warmed thoroughly before being scorched on the outside. The fire must be quite clear and brisk. It is customary to allow a quarter of an hour for every pound of the meat. While roasting, baste it very frequently with its own dripping. In dishing, pour a little boiling water and salt over it for a gravy. A well-roasted joint ought to have a nice rich brown tinge all over, and this is to be obtained only by careful basting, attention to the fire, and removing at the proper time, when experience tells that the joint is "done." Garnish with scraped horse-radish.

To roast Mutton.—The best parts of mutton for roasting are the leg (called in Scotland the gigot), the shoulder, and the loin. The piece may be kept longer than would be desirable for mutton for boiling. It should have a clear and brisk fire. A leg will take two hours to roast; but this, as well as the time for roasting the other parts, must be regulated by the fire and the weight of the meat, and can be learned only by attention. The joint of mutton should be basted the same as beef, with its own dripping. A gravy for roast mutton, as in the case of beef, may be made by pouring a little hot water and salt over it; if wanted of a richer quality, a gravy sauce may be made from beef, as directed under the head Sauces. Most persons prefer mutton "well done." In roasting the loin, take away the fat surrounding the kidney, otherwise the dish, on being brought to table, will, when cut up, be floated with oil. The back-ribs and loin of mutton ought to be well jointed or cut before being put to the fire.

To roast Venison.—Venison is roasted in the same manner as mutton, but requires longer time at the fire. It is such a dry meat, and the fat is so easily melted, that it should be covered with buttered paper, and well basted. Serve with a good gravy and currant jelly.

To roast Veal.—The best parts of veal for roasting are the fillet, the breast, the loin, and the shoulder. The fillet and the breast should be stuffed, particularly the fillet; the stuffing to be composed of crumbs of bread, chopped suet and parsley, a little lemon peel, and pepper and salt, wet with an egg and a little milk. The piece should have a slow fire at first, and will require longer time to dress than beef or mutton. Let it be well basted with butter when there is not sufficient dripping from the joint. The gravy for roast veal is either the usual hot water and salt, or thin melted butter, poured over the meat.

To roast Fillet of Veal.—The fillet of veal, which is the thick fleshy part of the hind leg, requires care in the preparation for roasting. The knuckle or bone must be cut out neatly, without disfiguring the joint; then stuff the flap, as above; roll it up firmly, and bind it with tape or string. Allow the stuffing in this, as in all other cases, room to expand in dressing. Cover the ends with buttered paper, and baste the piece frequently with butter. Take off the paper a short time before the meat is done. Gravy as above. This dish may be garnished with sliced lemon.

To roast Lamb.—Lamb also requires to be well roasted. It is usually dressed in quarters; all parts, particularly the spinal bone, should be well jointed or cut by the butcher or cook; and the ribs of the fore quarter broken across the centre, in order to accommodate the carver. In roasting, baste, as for already described, with its own dripping. The gravy for lamb may be the same as for beef and mutton, namely, hot water and salt poured over it; it is also customary to serve it up with mint sauce in a small tureen.

To roast Pork.—Pork requires a longer time in roasting than any of the preceding meats. When stuffing is to be used, it must be composed of chopped sage and onion, pepper and salt. The pieces should be neatly and well scored in regular stripes on the outer skin, to enable the carver to cut slices easily. Before putting to the fire, rub the skin with salad oil, to prevent its blistering, and baste very frequently. The basting may be done by rubbing it with a piece of butter in a muslin bag, where there is not enough of dripping. The gravy for pork may be the same as for other joints, hot water and salt poured over it on the dish. It is considered an improvement to have apple-sauce served in a small tureen, as it assists in overcoming the richness or lusciousness of the meat, and imparts a slight acidulous flavour.

To roast Sucking-Pig.—The animal being properly prepared and cleaned by the butcher, the cook will proceed to cut off the feet, and fill the inside with a stuffing composed of chopped sage, crumbs of bread, butter, pepper, and salt. The quantities of these respective ingredients must be regulated by the judgment and taste of the individual. The principal ingredient is bread. The stuffing being mixed and filled in, sew up the slit. No skewering is required. In roasting, baste with butter, as directed for pork. The time for roasting will be from two or three hours, according to the size. The skin should be crisp, and nicely browned. Before bringing to table, split down the back from head to tail, and lay it

flat in the dish with the skin side uppermost. The head is cut off, and, being split in two, a half is laid at each end. The brains are taken out, and, with the liver, which has been previously boiled and finely chopped, is mixed either with beef or veal gravy in a small tureen. Apple-sauce is also used. This is the most approved mode of serving up sucking-pig.

To roast Bullocks' Heart.—Wash the heart well, freeing it completely from blood. Then fill all the openings at the top or broad end with a stuffing composed of crumbs of bread, chopped suet, parsley, pepper and salt, moistened with an egg and a little milk. Suspend with the pointed end downwards. An hour and a half or two hours, according to the degree of heat, will cook the dish. It should, however, be well done. Send to table with beef gravy.

To roast Pigeons.—Pick and draw them well, and truss, keeping on the feet. Make a stuffing of the liver chopped, crumbs of bread, minced parsley, pepper, salt, and a little butter; put this inside. Make a slit in one of the legs, and slip the other leg through it. Skewer and roast them for half an hour, basting them well with butter. Serve with brown gravy in a small tureen. Some serve roast pigeons, or game, with toast bread beneath them, and bread sauce.

To roast Fowls.—Pick, draw, and singe them. A fowl should be so cleanly or well drawn as to require no washing. Take care not to break the gall-bag in drawing; if the gall be spilled, it will communicate a bitter taste to every part it touches. Press down the breast-bone. Break the legs in the middle of the first joint, drawing out the sinews, and cutting off the parts at the break. It being proper that roast fowls should have a neat appearance at table, it is customary to truss them, that is, to fix their legs and wings in a particular position. This is done by fixing down the knees of the animal close to the tail by a skewer or piece of string, leaving the stumps of the legs projecting. The pinion ends of the wings are then turned round on the back, the liver being placed as an ornament in one wing and the gizzard in the other. Cut the head off close to the body, leaving a sufficiency of the skin to be tied or skewered on the back. Baste well with butter for some time after putting to the fire. Suspend neck downwards. The time of roasting will vary from half an hour to an hour, according to the size of the chicken or fowl. When fowls are large, they are frequently stuffed like turkey.

Serve roast fowls with melted butter or gravy sauce. Before sending to table, remove all skewers and strings which may have been used in trussing. This, which should be done in all cases of serving dishes to table, is too frequently neglected, and shows slovenliness in cookery. Fowls and all other feathered animals are served with the breast upwards.

To roast Turkey.—Pick, draw, and singe the turkey well. Press down the breast-bone, and follow all the directions given for trussing fowls. The breast should be stuffed with crumbs of bread, minced beef suet or marrow, minced parsley, a little nutmeg, pepper and salt; wet it with milk and egg; a little sausage meat may also be added. On finishing, sew up the orifice or neck. Before putting to the fire, cover the breast with a sheet of writing-paper well buttered, to preserve it from scorching, and which may be removed a short time before taking from the fire, to allow the breast to be browned. Baste well with butter. A turkey will take from an hour and a half to two hours. Serve with gravy sauce and bread sauce.

To roast Partridges.—Pick, draw, singe, and clean these birds the same as fowls. Leave the head on. Make a slit in the neck, and draw out the craw. Twist the neck round the wing, and bring the head round to the side of the breast. The legs and wings may be

trussed in much the same manner as fowls. The feet are left on, and crossed over one into the other, as seen in the annexed figure. Baste well with butter before a clear fire. When about half done, dust a little flour over them to be browned. A partridge will take from twenty minutes to half an hour, and a pheasant three quarters of an hour. Serve on toasted bread, with gravy and bread sauce; the toasted bread may be dipped in the gravy.

Grouse and blackcock should be dressed and served in the same manner; the head being trussed under the wing. Snipes and woodcocks are not drawn.

To roast Goose.—Pick, draw, and singe the goose well. Cut off its head and neck. Take off the legs and wings at the first joint. The portions of the legs and wings that are left are skewered to the sides. Stuff with chopped sage and onion, and crumbs of bread, with pepper and salt. The skin of the neck must be tied securely, to prevent the gravy from running out. Paper the breast for a short time. A goose does not require so much basting as fowl or turkey, for it is naturally greasy. It will require from two hours to two hours and a half in roasting. It ought to be thoroughly done. Serve with gravy sauce and apple sauce. The liver, gizzard, head, neck, feet, and the pinions of the goose; form what is termed the *giblets*, and compose a good stew or pie.

To roast Ducks.—Pick, draw, and singe them well. Take off the head. Dip the feet in boiling water to take off the outer yellow skin. Truss them neatly, turning the feet flat upon the back. Stuff as in the case of goose, and serve with the same sauces. A duck requires about an hour in roasting.

To roast Pheasants.—Pick, singe, and draw them, the same as fowls. Truss them by twisting the head round one of the wings, and turning both wings on the back. The legs are fixed on each side, much in the same manner as in a roast fowl, the feet being left on, as here represented. Serve with beef gravy and bread sauce.

To roast Hare.—A hare will keep with the skin on it, and paunched, for about three weeks in cold weather. It is then fit for roasting. First cut off the feet, and commence drawing off the skin at the hind legs, proceeding along the body to the head. Be careful not to tear the ears in skinning them. Soak and wash well in several waters, and then wipe quite dry. Stuff with crumbs of bread, chopped parsley, a bit of beef or veal suet chopped finely, a little grated lemon-peel and nutmeg, a piece of liver boiled and finely chopped or grated, and pepper and salt; the whole moistened with an egg, a little milk, and a spoonful of ketchup. The skin of the belly afterwards to be sewed. Commence trussing, by placing the hind and fore legs flat against the sides. To make the hind legs lie flat, the under sinews must be cut. Fix the head between the two shoulders, on the back, by running a skewer through it into the body. In roasting, suspend head downwards. It may be basted first with milk, afterwards with butter, flouring it lightly

it will require from an hour and a half to two hours. The hare is dished back upwards, as represented above, and served with a dish of rich beef gravy, and a dish of currant jelly.

BAKING MEAT.

Meat is prepared for baking in the same manner as for roasting. It should be placed in a deep dish for receiving the fat which flows from it; not laid, however, on the sole of the dish, but raised on a stand, to prevent the grease soaking into it. Small iron stands are made and sold for this purpose. Few dishes are so good when baked as when roasted, the meat being so liable to be shrivelled for lack of basting. Perhaps the only dishes which are better baked than roasted, are bullock's heart and leg of pork, because in roasting they are liable to be scorched on the outside before they are thoroughly cooked in the inner parts. In baking a heart, place it in a stand in a dish with the point downwards; a piece of writing-paper, buttered, may be placed over it, to keep the stuffing from drying. The sauce used is beef gravy.

BROILING.

Broiling is the rapid cooking of any kind of animal food, by the influence of fire. The apparatus required in broiling is very simple, and consists only of a gridiron, which should have small bars, and be kept thoroughly clean, not only on the tops, but on the sides of the bars. Let it be heated on the fire for a few minutes before placing the meat on it. If the bars, when warm, be rubbed with a piece of brown paper, the meat will be prevented from sticking to them. The operation of broiling requires a clear, strong fire, with no smoke. In almost all cases, the meat ought to be frequently turned, which may be best done by a pair of small tongs; a fork should on no account be used in turning, for it breaks the skin of the meat, and allows the gravy to run out. Broiling possesses the peculiarity of being applicable only to meat which is to be eaten immediately on being dressed. This is an advantage when expeditious cooking is required, but a disadvantage when there is any uncertainty as to the time at which the meat is to be eaten.

To broil Beef-steak.—A beef-steak is the most suitable of all kinds of meat for broiling, and is a dish universally relished. There are several parts of beef used for steaks, but in every case it should not be too newly killed. The best steak is that cut from the rump (called in Scotland the *heuk-bone*), because it is the most juicy and well flavoured. Steaks should be cut in slices of from three quarters of an inch to an inch in thickness, and into pieces of a convenient size for turning. Some persons dust the steaks with pepper before putting them to the fire, by which means the flavour of the pepper is infused through the mass. When placed on the gridiron, turn them very frequently; it is said, indeed, that the steaks should never be at rest, but this is carrying matters to an extremity. It is impossible to state any exact length of time to be employed in cooking a steak, for much depends on the tenderness and thickness of the meat, and the strength of the fire. The taste of the individual who is to eat the steak must also regulate the length of time; because, while some prefer steaks in a half-raw state, others wish them to be well done. When cooked to the extent which is required, place the steak on a hot dish, and, after rubbing the steak with a little good fresh butter, sprinkle it with a little fine salt.

Beef-steaks should be carried to table immediately on being dressed, and eaten forthwith, in order to be in perfection. Every moment they stand, they lose a portion of their flavour and juice. When sauce is required, either mushroom or oyster sauce may be used.

To broil Mutton-chops.—Mutton-chops should be cut from the middle of the hind loin, and about the same thickness as steaks. They are broiled in the same manner as steaks, and require equal attention. No butter is to be used on dishing, as the chop is sufficiently fat of itself. Sprinkle a little salt on it, and carry to the table immediately. Mushroom sauce may be used.

To broil Fowls and Pigeons.—Clean and prepare them as for roasting; then split them down the back, laying them quite flat. Dust with pepper. They should be broiled more slowly than steaks or chops, being thicker, and requiring to be more thoroughly dressed. Rub occasionally with a little butter, to prevent the skin from cracking. In no case should the skin be taken off before broiling. On dishing, sprinkle with salt.

Various sauces are used—parsley and butter, melted butter, beef gravy, or mushroom sauce.

FRYING.

Frying is as expeditious a mode of cooking as broiling, requires less activity and care, and is more thrifty. The thriftiness of frying is a point of material consequence, and may be thus explained. It affords a ready means of dressing in a savoury manner many odd pieces of uncooked or cold meat, thereby saving that which might otherwise have been thrown away as useless. A skilful housewife, with the aid of a frying-pan and some unexpensive vegetables, such as onions and potatoes, along with a slight seasoning, will make a small portion of meat dine a large family.

A trying-pan should be of malleable, not of cast, iron. It should also be thick in the bottom, and of an oval form. It should always be kept clean, by being washed with boiling water, but not scoured. In all cases of using, a small piece of dripping, butter, or lard, must be put into it and melted, to prevent the meat from adhering. In frying all meats, excepting those which are sufficiently fat of themselves, it is necessary to use some kind of grease or fat. The best fat for this purpose is lard, which is more economical, and less likely to burn than butter. When lard is not employed, the best substitute for it is dripping.

To fry Beef-steaks.—Cut the steaks as for broiling, and, on being put into the pan, shift and turn them frequently. Let them be done brown all over, and placed in a hot dish when finished. Gravy may be made by pouring a little hot water into the pan after the steaks are out, and the fat poured away, with a little pepper, salt, ketchup, and flour. The gravy so formed is to be poured into the dish with the steaks. Serve to table immediately.

If onions be required along with the dish, cut them in thin slices, and fry them till they are soft. They should be fried after the steaks, and merely with part of the fat in which the beef has been fried.

To fry Mutton-chops.—They require to be cut in the same manner as for broiling, and may be dressed according to the preceding directions for steaks. None of the grease which flows from the chops is to be used along with them, and the whole must be poured away before preparing the gravy.

To fry Veal cutlets.—Veal cutlets form a delicate dish, and should be fried with butter. The best cutlets are from the fillet, because they are free from bone; the fore or hind loin—that is, the back-ribs or loin—may be used, but the bone must be cut away, which causes a waste. Cut them half an inch in thickness. They require to be dressed slowly and thoroughly, and should be of a light brown tinge when finished.

Another and more tasteful way of dressing cutlets, is first to dip them in a beat egg and then strew them with crumbs of bread, and parsley chopped very fine, along with pepper and salt, after which put them in the pan. They will require more lard or dripping this way than when fried plain.

Gravy may be made for cutlets the same as for fried steaks, but add a little juice of lemon, and skim the gravy before pouring it over the cutlets.

To fry Lamb-chops.—Lamb-chops may be either simply fried in the same manner as mutton-chops, or dressed with egg and crumbs of bread (but with no parsley), as in the case of cutlets. Gravy made in the pan, as for fried steaks.

To fry Pork-chops.—Pork-chops should be cut rather thin, and be thoroughly dressed. They may be either simply fried in the same manner as chops, or fried after being dipped in egg, and sprinkled with crumbs of bread, and sage and onion finely chopped. No gravy is expected with pork-chops. If any sauce be used, it must be apple-sauce.

To fry Beef or Pork Sausages.—All sausages are fried alike, and require to be dressed very slowly. Before being put into the pan, they should be pricked in several places with a fine fork, to prevent their bursting by the expansion of the air within.

It is common in England to bring fried sausages to table, neatly laid out on a flat dish of mashed potatoes. The sausages and potatoes are helped together. They may also be laid in links on toasted bread, and garnished with poached eggs round the dish.

Fried sausages are sometimes used for garnishing roast turkey.

To fry Tripe.—The tripe must be washed well, and boiled till tender. Take the thickest parts, and dry them well with a cloth. Make a thick batter of egg, flour, and milk, seasoned with salt, and for those who wish it, a little minced onion. Dip the tripe into the batter so formed, after which fry in lard or good fresh dripping, of which there must be a sufficiency in the pan almost to cover the tripe. Let it be done to a light brown. Garnish with fried parsley.

To fry Parsley.—Parsley is fried only for garnishing. It must be thoroughly dried, and fried in hot butter or dripping. After frying, lay it on a sieve before the fire for the fat to drain from it; after which, place it round the edge of the dish.

To fry Bacon, or Ham and Eggs.—The bacon should be cut very thinly in slices not more than a quarter of an inch in thickness. The best bacon is that which is alternately streaked with fat and lean. No butter or dripping is required in the pan in frying bacon, which does not need much dressing, and is soon prepared. When done, take the slices from the pan, and place them in a hot dish before the fire. Have the number of eggs required previously broken, each in a separate cup, and place them gently in the pan, so as to preserve them in a round flat shape. Let them remain in the pan till the white is set, and take them out carefully with a slice, and place them on the bacon. The tasteful appearance of this dish is spoiled if the eggs be either broken or ragged, which is very apt to be the case if they are not previously put into cups.

To fry Collops.—The difference between this dish and fried steaks, is, that the collops or pieces of meat are partially stewed, as well as fried. Cut the meat thinner than for broiling, and put the slices in a pan along with a large piece of butter and sliced onions. Cover it close, and when the meat is sufficiently dressed, add a little hot water and ketchup to the liquor already in the pan.

BOILING.

Boiling is the preparation of meat in water, and it is necessary that the vessel employed be large enough to allow the meat perfect freedom; if it be cramped, and have only a little water, it will be stewed, not boiled. In all cases of boiling, there must be a sufficiency of water to cover the meat. In boiling meat there is less waste than in roasting; and, in some cases, soup may be made of the liquor. It is a general direction for boiling, that all meat, poultry excepted, should be put into cold water, and not boiled too fast. In every case, let care be taken to remove the scum from the top of the water, just before it boils; this keeps both the meat and the water clean, and agreeable in appearance. As the water decreases from evaporation, replenish with *hot* or *boiling* water, so as to keep the meat always covered. It is usual to allow a quarter of an hour for every pound of the meat in boiling, reckoning from the time the water begins to boil; but this is a rule which will, of course, be departed from, according as the meat is required to be over or under done. In some cases, slow simmering is the most advantageous mode of dressing, and it is always better to boil slowly than quickly. Rapid boiling hardens the meat. Perfectly fresh meat requires longer boiling than that which is tender or ripe. Good meat swells in boiling, whatever may be the loss of weight.

When meat of any kind is done and has to be lifted from the pot, take care not to put a fork into any part where there are juices; if this be not attended to, a portion of the juices will escape, and the marks of the fork will produce an unsightly appearance in the meat. All parts of mutton and lamb may be roasted, but it is only the leg, neck, and head, that are boiled.

To boil a salted Round of Beef.—If large, cut out the bone, roll it up firmly, and bind it with a tape; then put it into the pot, and keep the lid close. Boil it slowly and equally, allowing, as above mentioned, a quarter of an hour for each pound of the beef.

The appropriate garnishing for this and other pieces of boiled salt beef, is carrot and small greens; some add turnips. Put a little of the liquor in which it has been boiled in the dish.

To boil a Leg of Mutton.—A leg of mutton should be kept four or five days before boiling. Before putting it into the pot, bend round the shank, cutting the tendon at the joint if necessary, so as to shorten the leg. Two hours of slow equal boiling will be sufficient for a good-sized leg of mutton. Some persons, to make the leg look white and tasteful, wrap it tightly in a cloth in boiling; but this spoils the liquor for broth. It is not safe to boil vegetables with a leg of mutton, as they are apt to flavour the meat. Dish the leg with a little of the liquor, placing the lower side uppermost, conveniently for carving. A good leg of mutton will soon yield sufficient gravy.

The sauce used is finely chopped capers in melted butter. Turnips mashed or whole form the appropriate vegetable to be eaten with this dish.

To boil a Leg of Lamb.—A leg of lamb, when well boiled, is a delicate and excellent dish. It requires about an hour and a half. When whiteness is desirable, it is wrapped in cloth, the same as mutton. When dished, garnish with the loin cut into chops, and fried, to lay round it. The sauce used is plain melted butter, or parsley and butter.

To boil Veal.—Veal is seldom boiled, being too insipid by that mode of dressing. The only part boiled is the knuckle, which requires much boiling, in order to soften the sinews. It is eaten with boiled ham or bacon. The sauce used is parsley and butter. The liquor from boiled veal is the best of any for making soup.

To boil a Turkey.—Boiled turkey is one of the most delicate and excellent dishes which can be brought to table, and should be dressed with as much care as possible. Clean the turkey from all feathers, and singe the hair with burning paper, being careful not to blacken the skin. Clean it well inside by drawing and wiping. Cut off the legs at the first joints, and draw out the sinews; then pull down the skin and push the legs inside. Cut off the head close to the body, leaving the skin long, and draw out the craw. Make a stuffing of chopped suet, crumbs of bread, chopped parsley, pepper, salt, and a

little nutmeg, which wet with an egg and milk. Put this stuffing into the breast, leaving room for the stuffing to swell; after which draw the skin of the breast over the opening and sew it neatly across the back; by which means, when the turkey is brought to table with its breast uppermost, no sewing will be seen. Place the liver in one wing, and the gizzard in the other, turning the wing on the back, and fixing the wings to the sides with a skewer. The turkey being now ready for the pot, put it into a cloth and boil it for a length of time according to the size and age. A small young turkey will not require more than an hour and a half; an old and larger one perhaps two and a half or three hours. Let the water be warm in putting in, and of sufficient quantity to keep the turkey always covered.

When done, and placed in a hot dish, pour a little sauce over the breast, and put the remainder in a sauce tureen. The sauce used is various, as parsley and butter, celery, or oyster sauce. One of the most delicate and agreeable sauces, is that which is made of melted butter, boiled maccaroni, and milk.

To boil a Fowl.—A fowl is to be prepared for boiling in the same manner as a turkey, except that no stuffing is used. It may be boiled with or without a cloth. Small fowls will require from half an hour to three quarters of an hour; large fowls will require from an hour to an hour and a half. Sauce, parsley, and butter.

To boil Rabbits whole.—Wash them well in warm water. They may be either stuffed or not stuffed, according to taste. When stuffing is required, make it of crumbs of bread, suet, parsley, and onions—all chopped—and pepper and salt; moisten with milk and egg. Sew this neatly into the belly. Truss in the same manner as roast hare, and boil slowly for an hour. The sauce to be made of boiled onions, milk, melted butter, and flour, with pepper and salt, which pour over the rabbits when dished. This is called *rabbits smothered in onions.*

When two rabbits are dished together, lay the head of one in a contrary direction to that of the other.

To boil a Ham.—If the ham has been cured long, it may require soaking in cold water to soften it, from twelve to twenty-four hours before dressing. Put it in a large boiling vessel, with plenty of cold water, and let it simmer slowly from two to four hours, according to the size. Skim it frequently, to remove the grease which is constantly rising to the top. When done, skin it, and strew bread raspings over the upper side; then place it before the fire to dry and brown. Garnish with greens or cabbage.

To boil Leg of Pork.—Pork requires to be particularly well boiled. Place it in the pot with the skin side uppermost, with a plate below it, for pork is very apt to stick to the bottom of the pot. Peas pudding is generally served separately with this dish.

To boil a Tongue.—If hard, soak the tongue in water all night before using. Boil it from two hours and a half to three hours. Skin it before dishing. Garnish with greens or cabbage.

To boil Tripe.—When tripe is purchased from the butcher in a raw state it requires to be boiled a very long time to be thoroughly soft and tender. The length of time will depend on the age of the animal from which it has been taken. Sometimes, for young tripe six or seven hours will be sufficient, while old tripe will perhaps take ten or twelve. In all cases, boil, or rather simmer it very slowly, for quick boiling hardens it. It should be cut into moderately sized pieces for helping at table. When to be served plain, carry to table in a hash dish, in some of the water with which it has been boiled, with boiled onions in it. A tasteful way of serving, is to take it from its liquor after boiling, and stew it for about ten minutes in a saucepan with milk, which thicken with a little arrowroot, or flour and butter, and season with pepper and salt. This makes a delicious and cheap dish.

To boil Cow-heel.—Cow-heel should be boiled for five or six hours, or till the bones will slip out. Serve with a sauce of chopped parsley and butter.

STEWS, HASHES, AND MADE DISHES.

Stewing is the preparing of meat by slow simmering or boiling, and by which all the liquor is to be used along with the meat at table. This is a much more savoury mode of cookery than boiling, because the substance of the meat is partly in the liquor, and is seasoned to have a high relish or flavour. Generally, much more can be made of meat by stewing, than by roasting, broiling, or frying, because nothing is lost in the process of dressing. It also possesses the decided advantage of being a way by which meat may be dressed for a person whose time of dining is uncertain. A stewed steak, for instance, will keep warm and in good condition for an hour, but a broiled or fried steak cannot keep a minute after dressing.

To stew a piece of Beef, or make Beef Bouilli.—Take a piece of beef—the brisket or rump, or any other piece that will become tender. Put a little butter in the bottom of the stew-pan, and then putting in the meat, partially fry or brown it all over. Then take it out, and lay two or three skewers in the bottom of the pan; after which replace the meat, which will be prevented from sticking to the pan by means of the skewers. Next, put in as much water as will half cover the meat. Stew it slowly, with the pan closely covered, till done, with a few onions, if required. Two hours are considered enough for a piece of six or eight pounds. When ready, take out the meat, and thicken the gravy with a little butter and flour. Cut down into handsome shapes a boiled carrot and turnip, and add them to the liquor; season with pepper, salt, and a little ketchup. Boil all together for a few minutes, and serve in a hash dish.

To stew a Shoulder of Mutton.—Take a shoulder of mutton, and cut out the blade bone without injuring the form of the meat. Make a stuffing of crumbs of bread, chopped suet and parsley, a little green or dried sweet herbs, chopped onion, and pepper and salt, moistened with egg and milk. Lay this stuffing in the place from which the bone was cut out; then roll it up, and skewer or bind it firmly with tape. Rub the bottom of a stew-pan with suet or butter, and brown the mutton. When sufficiently brown, lay two skewers in the bottom of the pan; add a little stock or boiling water, and let it stew for an hour and a half; the gravy drawn from itself will be sufficiently rich for sauce, seasoned with pepper and salt. Skim it before serving, to remove the fat.

To stew Steaks and Chops.—Cut the beef in slices rather thinner than for broiling or frying. Put them in a stew-pan, with water sufficient to make gravy. Add grated carrot, turnip cut in small squares, and pepper and salt. Stew for an hour, or till tender. Skim if necessary. When done, thicken the gravy with a little arrowroot or flower, and flavour with ketchup. Some persons add a little maccaroni or vermicelli, which requires from ten to twenty minutes' boiling along with the stew.

Mutton-chops are stewed in the same manner, but require to be trimmed of the superfluous fat, and more carefully skimmed. This is called *harricot of mutton* when the chops have been previously browned. The same directions will serve for stewing slices or pieces of any other kind of meat.

To stew Veal.—The best parts of veal for stewing are the fillet, the breast, and the shoulder. The shoulder must be stuffed when the knuckle is cut out, which must be done neatly, without disfiguring the meat; the stuffing

should consist of bread-crumbs, minced suet, chopped parsley, grated lemon-peel, white pepper and salt, moistened with egg and milk; fill the shoulder, and sew it up. Rub the bottom of a large stew-pan with butter, lay in the veal, and brown it on both sides. When sufficiently brown, put in a pint of cold water, and stew it slowly for two hours, or, if large, two hours and a half. Before it is to be dished, draw off the gravy, and if not thick enough, brown a little butter, and dust in a little flour; put it among the gravy, and season with Cayenne, salt, and the squeeze of a lemon (a glass of sherry will be an improvement); skim the sauce, and pour it over the meat before dishing.

To stew Kidneys.—Cut the kidneys into slices; wash them, and dry them with a clean cloth; dust them with flour, and fry them with butter until they are brown. Pour some hot water or beef gravy into the pan, a few minced onions, pepper and salt, according to taste; let them stew slowly for an hour, and add a spoonful or two of mushroom ketchup before dishing.

To stew Pigeons.—Pick and wash the pigeons well, trussing them as fowls for boiling. Put a piece of butter and some pepper inside; dust them with flour, and brown them in a covered stew-pan with a good piece of butter; put in a little flour; add some gravy or hot water. Season them highly, and let them stew slowly for twenty minutes or half an hour. Before dishing, add half a glass of port wine, if the flavour be approved.

To stew Rabbits.—Wash the rabbits well; cut them in pieces, and put them into scald for a few minutes. Melt a piece of butter, in which fry or brown the rabbits for a short time. When slightly browned, dust in some flour; then add as much gravy or hot water as will make sufficient sauce. Put in onions, ketchup, pepper and salt, according to taste. Stew for an hour slowly. When required, flavour the gravy with a small quantity of curry powder.

To make Irish Stew.—Take a piece of loin or back-ribs of mutton, and cut it into chops. Put it in a stew-pan with pared raw potatoes, sliced onions, pepper, salt, and a little water. Put this on to stew slowly for an hour, covered very close; and shake it occasionally, to prevent it from sticking to the bottom.

To make English Stew.—English stew is the name given to the following excellent preparation of cold meat. Cut the meat in slices; pepper, salt, and flour them, and lay them in a dish. Take a few pickles of any kind, or a small quantity of pickled cabbage, and sprinkle them over the meat. Then take a tea-cup half full of water; add to it a small quantity of the vinegar belonging to the pickles, a small quantity of ketchup, if approved of, and any gravy that may be set by for use. Stir all together, and pour it over the meat. Set the meat before the fire with a tin behind it, or put it in a despatch, or in the oven of the kitchen range, as may be most convenient, for about half an hour before dinner-time. This is a cheap and simple way of dressing cold meat, which is well deserving of attention.

To hash Beef or Mutton.—Cold roast beef, or cold roast or boiled mutton, may be dressed as a hash in the following manner. Cut the meat from the bones into small pieces, and lay them aside. Then put the bones in a stew-pan, with a little water and sliced onion. After stewing for a short time, take out the bones and put in the meat. When the meat is perfectly hot, thicken with a little flour and butter, and season with pepper and salt, and a little ketchup. Dish the hash, and stick small triangular pieces of dry toasted bread round the inner edge of the dish.

To dress Cold Boiled Beef, or make Bubble and Squeak.—Cut the beef in slices of about the third of an inch in thickness. Fry the slices till lightly browned, and heated through. Then take them from the pan, and place them on a warm plate before the fire, to keep hot. Fry some cabbage which has been previously boiled and chopped; stir this about a short time in the pan, and season with pepper and salt. Spread the cabbage in a dish, and place the slices of meat upon it; or heap the cabbage in the dish, and place the meat around it.

To mince Cold Veal.—Cut the veal from the bones, and mince it in small square bits, and lay them aside. Then put the bones in a stew-pan with a little warm water, to make a gravy. After stewing for a short time, take out the bones and put in the bits of veal, with a small piece of lemon-peel, chopped very fine. When perfectly heated, thicken with a little flour and butter, and season with pepper and salt, and a little lemon-juice. Dish with small pieces of toasted bread, as in hashed mutton.

To dress a Lamb's Head and Pluck.—Lambs' heads are procured skinned. Take the head with the neck attached; split up the forehead, and take out the brains, which lay aside. Wash the head carefully, cleaning out the slime from the nose, by rubbing it with salt, and take out the eyes. The head being thus cleaned, put it on to boil, along with the heart, and the lungs or lights. Let the whole boil for an hour and a quarter; then take them out, and dry the head and neck with a cloth. Rub it over with an egg well beaten; strew crumbs of bread, pepper and salt, over it; also stick small pieces of butter over it, and lay it in a dish before a clear fire, to be browned lightly. Mince the lungs and heart, and part of the liver, with some onion, parsley, pepper, salt, a little flour, grated nutmeg, and a table-spoonful of ketchup; mix all together, and add some of the liquor in which the head was boiled to form a gravy; let it simmer by the side of the fire for half an hour. Take the brains and beat them well with two eggs, two table-spoonfuls of flour, and a sprig of fine chopped parsley, also a little pepper and salt, and two or three table-spoonfuls of milk—the whole forming a batter. Have a frying-pan with a little lard or dripping, and fry the batter in small round cakes, which turn and brown lightly on both sides. Cut the remainder of the liver in slices, and dust it with flour, and fry it. Now, lay the head upon a dish; place the hash round it, and lay a slice of liver and a brain cake alternately on the hash all round.

This forms a handsome and a savoury dish, but requires great attention on the part of the cook, to have all the various parts hot and equally ready at the time of dishing.

To make Potted-Head.—This is a dish to be eaten cold as a jelly. Take the half of a bullock's head and clean it; soak it in warm water, with a cow-heel, for two or three hours. Then boil it with the heel till tender. When done, cut them in small pieces, and lay them aside; after which, strain the liquor in which they have been boiled, and let it stand till it is cold, so that the fat may be easily skimmed. Put the whole into a sauce-pan, and boil for half an hour, and season with pepper and salt according to taste. Pour it into basins, or tin or earthenware shapes, which stand in a cool place. When quite cold, it forms a jelly, and is ready for being turned out on a dish for use. If it do not come out easily, dip the basin or shape in hot water, and the heat will immediately loosen it. Garnish with sprigs of fresh parsley.

SOUPS AND BROTHS.

Soups are the substance of meat infused in water by boiling, and are of many different kinds, but may be divided into two classes, namely *brown* and *white*. The basis of brown soups is always beef, while the basis of white soups is generally veal. Broths are preparations of soup, but more simple in their nature, and usually containing some kind of vegetables or matter for thickening, as rice, barley, &c. Soups of every description

should be made of sound fresh meat and soft water. It is a general rule to allow a quart of water for every pound of meat; also to boil quickly at first, to make the scum rise, which is assisted by adding a little salt; and after skimming, to simmer gently.

To make Brow or Gravy Soup.—Take a shin or piece of the rump of beef, and break it in several places. Cut the beef from the bones; take out part of the marrow, and lay it on the bottom of the pot. If there be no marrow, use butter. Then lay in the meat and bones to brown. Turn the whole, when browned, on one side, and take care that it does not burn. When it is thoroughly browned, add a pint of cold water to draw the juice from the meat, also a little salt; and in a quarter of an hour after, fill in the quantity of cold water which may be requisite. Now add the vegetables, as for instance, two carrots, a turnip, and three or four onions, all sliced; also a stalk of celery, some sweet herbs, with some whole black and Jamaica pepper. Let the soup boil slowly for from four to five hours, after which take it off, and let it stand a little to settle. Then skim off the fat, and put it through a hair sieve to clear it. The soup, if cleared, may now be either served or set aside for after use. It should have a clear bright look, with a brownish tinge. Frequently, it is made the day before using, in order that it may be effectually skimmed of fat. In such a case, it is heated again before serving. On some occasions, it is served with a separate dish of toasted bread cut in small squares.

The meat which has made the soup is supposed to be divested of nearly all its nourishing qualities; but where thrittiness is consulted, it may form an agreeable stew, with vegetables, a little ketchup, and pepper and salt.

Brown soup made as above directed, forms what is called *stock*, that is, a foundation for every other soup of the brown kind, also a gravy for stews where richness is required. It likewise forms any kind of vegetable soup, by merely adding to it, when just finished boiling and clearing, the particular vegetable which may be required. Thus are formed *carrot soup*, the carrots being cut into small stripes or straws; *leek soup*, by adding leeks cut into short pieces, and boiling an hour; *vermicelli soup*, by adding boiled vermicelli; and so on with other vegetables.

Kidney Soup.—Make a stock, or gravy soup, as above directed. Cut two beef kidneys in slices; wash them well, and stew them in water or soup for an hour. Take out the kidneys and strain the soup. Then return the kidneys to the soup so strained, and add as much stock or gravy soup as is required. Let the whole boil for a few minutes, and serve in a tureen.

Pigeon Soup.—Make a stock, or gravy soup, as above directed. Add to this the livers and gizzards of your pigeons, and boil for half an hour. Then truss the birds as for boiling, and season them inside with pepper and salt; dust them over with flour, and brown them with a little butter in a frying-pan. Mix a little butter and flour, and stir it into the soup to thicken it. Strain the soup, and put the pigeons into it. Let the soup with the pigeons boil very gently for half an hour, skimming when required, and serve in a tureen.

Ox-tail Soup.—Make a quantity of brown soup, as previously directed. Take two or three tails, and separate them, at the joints, into pieces. Put the whole in the soup, and boil till the meat is tender, but not till it comes from the bones. Add a little ketchup, and serve with the pieces of tail in the soup.

Hare Soup.—Take a fresh hare, and, when skinned, wipe it well with a cloth. Cut it open, and take out the entrails, taking great care not to lose any of the blood. Then cut the body into separate pieces, and put them in a pot with two or three quarts of water, along with any blood that may have run out. Put into the pot, also, two or three pounds of beef cut into pieces, likewise a sliced carrot, turnip, and onion, a few sprigs of thyme, a few Jamaica pepper-corns and four table-spoonfuls of flour mixed with cold water. Keep stirring till it boil, and let it boil for an hour and a half. When this is done, take the best pieces of the hare, which are the back and upper joints of the hind legs. Lay these aside. Let the soup boil for other two hours. Then take out the remainder of the meat, and cut it off the bones and pound it in a mortar, or otherwise mash it well. Put the meat thus pounded back into the soup, and strain the whole through a hair sieve. Put the soup so purified into the pot, along with the best pieces of the hare which were laid aside, also two table-spoonfuls of ketchup. Boil this for half an hour: then add pepper and salt, and serve with the pieces of hare in the tureen.

Jugged Hare.—After having skinned, drawn and washed the hare, cut it into pieces, and put the pieces into a jar with an onion, a bunch of sweet herbs, and a little water. Cover the top of the jar so close that very little of the steam can escape from it; the cover may be tied down to the jar. Place it in a saucepan of water, the water not to cover the top of the jar. Keep the water constantly boiling. Boil between three and four hours. When done, skim off any fat, thicken the sauce with flour and butter, season with salt and pepper, and serve all together in a hash dish.

Mock-Turtle Soup.—This is made with a calf's head. It is best to get the head ready scraped and cleaned from the butcher, but with the skin on. If it be got in an uncleaned state, wash it, and put it into a pot with cold water, and boil it for a short time till the hair is loosened. Then scrape off the hair, split the head, clean it thoroughly, and take out the brains. The head is now supposed to be clean, and ready for making the soup. Put it into a pot with considerably more water than will cover it. Skim it frequently as it warms, and let it boil gently for an hour. Take out the head, and when it has cooled, cut the meat off into handsome pieces, of about an inch square. Scrape and cut the tongue in the same manner. Lay all these pieces aside. Then put into the water in which the head was boiled, about three or four pounds of hock of beef and a knuckle of veal, with the bones broken. Add to this four or five onions, a carrot and turnip sliced, a small bunch of sweet herbs, and some black and Jamaica pepper, whole. Add also the brains, after you have boiled them separately in a cloth, and pounded them. With all these additions let the soup boil slowly for four or five hours, after which strain it, and when cool, take off the fat. Take a quarter of a pound of fresh butter, and melt it in a stew-pan; when melted, put in two handfuls of flour and let it brown, stirring it all the time; add a little of the soup, a sprig or two of sweet basil, and a few heads of parsley. Boil this for a quarter of an hour; strain it through a sieve; then put this, the pieces of meat, and the soup, all together, and boil it for an hour. Add two table-spoonfuls of ketchup, the juice of a lemon, Cayenne pepper, and salt to taste. It is usual to put in at the same time four glasses of sherry wine. When dished in a tureen, put in two dozen of egg-balls.

Egg-balls for mock-turtle soup are made as follows. Boil four or five eggs till they are quite hard. Take out the yolks, and beat them in a mortar, with salt and Cayenne pepper. Make this into a paste with the white of one or two raw eggs. Roll the paste into balls the size of small marbles. Roll them in a little flour, and either fry them in butter or brown them before the fire, being careful to keep them whole and separate. They are now ready for being put into the soup.

Peas Soup.—This is an excellent soup, if well made, and is one of the cheapest dishes that can be put on the

table, for it may be formed of cold meat or marrow-bone, or, what is cheaper still, merely water, or the liquor in which any piece of mutton, lamb, or veal, has been boiled. We give the following two recipes for making it:—

Peas Soup, with meat or bones.—Take a good marrow-bone, or the bones of cold roast beef; a slice or shank of ham may be added, if the flavour be liked. Break the bones, and put them in the pot with four quarts of cold water. According to the thickness and quantity required, take two or three pounds of the best split peas, and put them among the cold water and bones; add to this two carrots, two turnips, half a dozen small onions, a stalk of celery cut in pieces, a bunch of thyme, and some whole black and Jamaica pepper. Let all this boil for two hours, stirring frequently, as the soup is very apt to burn. When the peas are quite soft and broken down, take the soup off, and put it through a sieve, into another pot; rub it well through until the pulp be mixed with the soup. Add salt melted among a little water, and boil the soup again for a few minutes. When to be served, cut a slice of toasted bread into small square pieces, and put in the tureen with the soup.

Peas Soup, without meat or bones.—Put two pounds or pints of peas in five quarts of water. Boil for four hours; then add three or four large onions, two heads of celery, a carrot and a turnip, all cut up; and season with salt, to taste. Boil for two hours longer. If the soup become too thick, add a little water. The peas may be boiled the evening before being used, and the longer they boil, the smoother and more mellow the soup will be; but do not put in the vegetables until the day the soup is to be used. By this plan the soup does not require straining.

Mutton Broth.—This is a broth of a mild nature, being intended chiefly for invalids. Take a scrag or thick end of a loin of mutton, and put it into a pot with cold water; the proportion being a quart of water to a pound of meat, which will allow for loss in boiling. Turnip and onion may be added when not considered injurious. Let this boil slowly for three hours, and skim off all the fat before serving. The meat is supposed to be useless.

Beef Tea.—Take a pound of lean beef, which cut in pieces, and put into a saucepan with a quart of cold water. Place it on a slow fire, and skim it carefully as it heats. Let it simmer gently for about an hour, and before serving, strain it through a hair sieve. Season with a little salt.

Another method.—Take a pound of good lean juicy beef, and cut it into very thin slices, which place in a basin. Then pour a pint and a half of boiling water on the meat, moving it frequently with a fork or spoon, to cause the water to act upon all sides of the meat, and so extract its juices. Let it remain in the water about a quarter of an hour, after which pour the water into a saucepan, and boil it for about ten minutes. Skim and season with salt. This is the most delicate way of making beef tea.

SCOTCH DISHES.

Sheep's Haggis.—There are different ways of making a haggis, as far as the exact composition of the materials is concerned. Some put minced tripe in it, others put no tripe. The following is the more common, and, we believe, the best manner of making it: Procure the large stomach bag of a sheep, also one of the smaller bags called the king's hood, together with the pluck, which is the lights, the liver, and the heart. The bags must be well washed, first in cold water, then plunged in boiling water, and scraped. Great care must be taken of the large bag; let it lie and soak in cold water, with a little salt, all night. Wash also the pluck. You will now boil the small bag along with the pluck; in boiling, leave the windpipe attached, and let the end of it hang over the edge of the pot, so that impurities may pass freely out. Boil for an hour and a half, and take the whole from the pot. When cold, cut away the windpipe, and any bits of skin or gristle that seem improper. Grate the quarter of the liver (not using the remainder for the haggis), and mince the heart, lights, and small bag very small, along with half a pound of beef suet. Mix all this mince with two small tea-cupfuls of oatmeal, previously dried before the fire, black and Jamaica pepper, and salt; also add half a pint of the liquor in which the pluck was boiled, or beef gravy. Stir all together into a consistency. Then take the large bag, which has been thoroughly cleansed, and put the mince into it. Fill it only a little more than half full, in order to leave room for the meal and meat to expand. If crammed too full, it will burst in boiling. Sew up the bag with a needle and thread. The haggis is now complete. Put it in a pot with boiling water, and prick it occasionally with a large needle, as it swells, to allow the air to escape. If the bag appears thin, tie a cloth outside the skin. There should be a plate placed beneath it, to prevent it sticking to the bottom of the pot. Boil it for three hours. It is served on a dish without garnish, and requires no gravy, as it is sufficiently rich in itself. This is a genuine Scotch haggis.

Lamb's Haggis.—This is a much more delicate dish, and less frequently made than a sheep's haggis. Procure the large bag, pluck, and fry of a lamb. The fry is composed of the small bowels, sweetbreads, and kernels. Prepare the bag, as in a sheep's haggis. Clean thoroughly the small bowels and other parts; parboil them, and chop them finely along with a quarter of a pound of suet. Mix with dried oatmeal, salt, and pepper, and sew the mixture in the bag. Boil it, and attend to it in the same manner as a sheep's haggis.

Broth or "Kail."—Broth is made of beef or mutton, but mutton is preferable, and is generally employed. The best broth is made as follows:—Put into a pot three quarts of cold water, along with a cupful of pearl barley, and let it boil. As soon as it boils, put in two pounds of the best part of the neck or back ribs of mutton. Allow it to boil gently for an hour, skimming occasionally, and watching to prevent boiling over. Then add one carrot grated, two small turnips cut in squares, a few small onions shred; also two or three pieces of carrot and turnip uncut. Instead of part of these vegetables, according to taste put in the half of a small cabbage chopped in moderately-sized pieces, or if cabbage cannot be procured, a similar quantity of greens. Leeks are also used instead of onions. Boil the whole for an hour longer, adding, if necessary, a small quantity of hot water to compensate the loss in boiling. The broth is now supposed to be done. Season with salt only, and serve in a tureen. The meat, which is not expected to be over-boiled, is served in a separate dish, garnished with the uncut pieces of turnip and carrot. By this preparation, both the broth and meat are used, so that a small quantity of meat produces food for a large number.

Hotch-potch.—This is a dish only to be obtained in perfection in summer, when green peas are in season. Put on two quarts of water, and when it boils, put in three pounds of the back ribs of mutton or lamb, paring off the fat if there be too much. Put in with the meat two or three carrots cut into squares, and two grated, also three or four sweet young turnips in squares, a cauliflower and a lettuce cut down, a few young onions shred, a little parsley, and about a pint of sweet young peas. Boil this for an hour and a half, then take out the meat and cut it in chops, laying it aside. Add another pint of young peas, seasoning with pepper and salt and when these peas are done, put in the chops. In a few minutes afterwards, serve up the whole in a tureen

Sheep's Head.—Procure as good a sheep's head as possible. The first thing done is to singe it with a hot iron, so as to free it completely from every particle of wool. This process is always performed in Scotland by a blacksmith, or some other person who makes a business of singeing heads. The horns should have been previously sawed off by the butcher. When singed and ready for the cook, soak the head for some time in warm water, and then scrape it till it is perfectly clean, and as nearly white as possible. The head must now be split, and the brains removed. Take out the eyes, and scrape and clean out the nose; after which wash the head again, and let it lie in warm water for a short time. It is usual to procure the trotters along with the head, and to subject them to a similar treatment, as regards singeing, cleaning, and washing. The head and trotters being now ready for the pot, put them in with a sufficiency of water, and let them boil till the skin is soft and tender, which may be in three hours. When ready, serve with the trotters round the dish, and garnish with boiled carrot and turnip. Some persons serve with parsley and butter.

Minced Collops.—Take a pound of good juicy beef, and a proportionate quantity of suet. Mince the whole very fine, as if for sausages, taking away any bits of gristle or skin. Melt a piece of butter in a frying-pan, and then put in the collops. Stir them well, adding a little flour, a little hot water or gravy, and season with pepper and salt, and a little ketchup. Onion may be chopped and put in along with the meat, if required. Ten minutes will dress a pound, which will form a dish for four or five persons. Serve in a hash dish.

Potato Soup.—Take any bones of cold roast meat, or a marrow-bone, or, failing these, a piece of dripping, which put into a pot with cold water, according to the quantity required. Let it boil a short time; then put in a quantity of potatoes well peeled or scraped, which have been previously soaked in boiling water to extract any disagreeable flavour from them. Add also one or two onions cut in pieces, a little pepper and salt, and let all boil for half an hour.

SAUCES AND FLAVOURS.

Sauces are liquid preparations to be used in giving a flavour or relish to dishes, and are of various kinds. A number are formed of melted butter, with an infusion of some other ingredients; others are in the form of gravies drawn from fresh juicy meat; and a third kind are composed partly of water and some preserves, condiments, or spices. There is little merit in making a good sauce when a person has good and proper materials to make it with. The chief method consists in furnishing a fine flavour from inadequate materials; as, for instance, giving a rich flavour of meat to a mass of potatoes, or some other plain dish, when no meat has been employed. This can only be done by knowing the qualities of various vegetable products, and how these, by means of cookery, may be made to resemble the juices of animal food. The vegetable products of which by far the most can be made by a skilful cook, are onions, mushrooms, and carrots. Onions and mushrooms, alone, furnish the most effectual substitutes for animal juices, and may be dressed so exquisitely as hardly to be distinguished from the gravy of beef.

Onion Flavour.—Onion flavour is made by stewing. Take several large onions, and remove the thin outer film from them. Put them in a saucepan with a little salt and flour, and a small piece of butter or dripping, to prevent their burning. Cover them quite close, and set by the fire to brown and stew gently. Two hours will dress them, and at the end of this time they will be quite soft, and, with the addition of a little water, they will yield a rich gravy. This may be used to fry potatoes with, or to flavour any other dish.

Mushroom Sauce.—Pick out the stems, and skin the mushrooms and the stems. Cut them in small pieces and wash them. Then put them in a saucepan, with rather more water than will cover them. Let them stew gently for about half an hour, or till they are soft. They will now have yielded a fine rich sauce. Stir in a little flour and butter kneeded together, and season with pepper and salt. This preparation may be eaten with potatoes, the same as meat; it also forms an excellent sauce to many dishes.

Melted Butter.—This must be made of fresh butter. Cut down the butter into small pieces, and put them into a small saucepan with cold water, in the proportion of an ounce of butter to a tablespoonful of water. Throw in flour from a dredger with the one hand, while with the other you turn the saucepan rapidly round, so as to cause the flour to mix without lumping. A small quantity of flour is sufficient. You now for the first time take the saucepan to the fire, and continue turning or shaking it till the butter is thoroughly melted. When it boils, it is ready; it should then have the consistency of rich cream. If it should oil in making, it may be partially recovered by putting a little cold water into it, and pouring it several times into and out of a basin.

This sauce is the foundation of a number of other sauces, various additions being made to it for the sake of variety.

Onion Sauce.—Skin the onions, and boil them in plenty of water. When they are soft, take them from the water, and chop them very fine. Melt butter as above, and stir them in, seasoning with a little pepper and salt.

Egg Sauce.—Boil three or four eggs till they are quite hard. Peel and chop them down, and then stir them into melted butter. Season with a little pepper and salt.

Caudle Sauce for plum-pudding.—Melt butter, as above directed, and stir into it a glass of sherry, half a glass of brandy or rum, a little sugar, grated lemon-peel, and nutmeg. Do not let it boil after the spirits are added.

Lobster and Crab Sauce.—Melt the butter, as above directed. Pick out the meat of a boiled lobster or crab; chop it down very fine, and put it amongst the butter. Season with Cayenne pepper, and salt. If the lobster be procured raw, with berries or spawn on the outside, these should be taken off previous to boiling, and being mashed in a little cold water, may be added to the sauce after the lobster is put in. By boiling a little, the whole will become a bright red. This forms an improvement on common lobster sauce.

Bread Sauce.—Grate down crumbs of bread. Put it in a saucepan on the fire, with as much sweet milk as will allow it to be thick. Add a piece of sliced onion, and stir it till the bread is soaked and the sauce is quite smooth. Season with pepper and salt.

Mint Sauce.—Take the leaves of fresh green mint. Wash them, and after drying them, chop them very fine. Mix them with vinegar, and add a little sugar.

Beef Gravy.—A pound and a half of beef will make a pint of good gravy. Cut the beef in slices, or score it very deeply. Place it in a saucepan, with a bit of butter to prevent it from sticking, and a sliced onion. Brown the meat gently, being careful not to let it burn. Cover it closely, and let it stand beside the fire for about half an hour, to allow the gravy to run from the meat. Then put in about a pint of hot water, and let it boil slowly for an hour and a half, with some whole pepper. Some persons put in to boil along with it, a piece of bread toasted hard and brown, which thickens the gravy a little and adds to its richness. Season with salt, and strain it through a hair sieve.

FISH.

Fish are dressed in a variety of ways, according to the taste of individuals. They are boiled, broiled, baked,

stewed, and fried; but the most common modes of preparation are boiling and frying—boiling when required to be done in a plain way, and frying when a high relish or flavour is to be given to them. In all modes of preparing fish, much care is required to prevent them from being broken or disfigured.

To boil Salmon.—Clean out, scale, and rinse the fish in water. Then put it in a good roomy fish-kettle, with plenty of cold water, and a handful of salt. The usual time allowed for boiling salmon is twelve minutes to each pound, but this must in a great measure depend on the thickness of the fish. The way to ascertain when it is ready, is to raise one end from the water, and try if a knife will pass easily betwixt the fish and the bone. If it pass easily, it is dressed sufficiently. When done, lift it immediately from the water, and place the fish drainer across the kettle, to allow the water to drip from the fish. Serve on a dish with a fish plate and white napkin under it, the napkin being next it. Garnish with green parsley. Sauce—plain melted butter, parsley sauce, or lobster sauce in a tureen.

To broil Salmon, or Salmon Steaks.—Cut slices from the thick part of the fish, and having cleaned and scaled them, dry them, and dust them with flour. Broil them on a gridiron over a clear fire. When ready, rub them over with butter, and serve hot, with any of the sauces used for boiled salmon. Slices of hung or *kippered* salmon are broiled in the same manner.

To fry Trouts, or similar Fish.—Trouts of a moderate size are dressed whole, and frying is the best mode of preparation. Take the trouts, and clean out and scale them. Dust them with flour, and put them in a frying-pan with hot dripping or lard. Turn them, so as to brown them on both sides. Lift them out and serve them on a dish; they will be improved by laying a napkin under them to absorb the grease.

In the country parts of Scotland, trouts are rubbed with oatmeal instead of flour, and some reckon that this improves the flavour.

To boil Turbot.—Select a thick fish of a white creamy colour. After cleaning, but not cutting any part except in gutting it, lay it in salt and water, with the addition of a little vinegar, and let it soak a short time before boiling. Put it with the white side or belly upwards in a fish-kettle on the fire, with plenty of cold water, a handful of salt, and a cupful of vinegar. Let it heat slowly, and boil for half an hour after it has come to the boil. When done, serve with belly upwards, and garnish with any small fish fried, or with parsley and scraped horse-radish. Sauce—lobster, oyster, or plain butter.

To bake Turbot.—Cut a small turbot into slices, which clean and free from bones. Dip the slices in beat egg, and roll them in a mixture of crumbs of bread, minced parsley, pepper and salt. Place them in a dish well buttered all round, and bake them in an oven not very hot, or in a bachelor's or Dutch oven before the fire. They must be basted frequently with butter. When done, lay the pieces in a dish, and pour round them lobster or oyster sauce, highly seasoned with Cayenne pepper, salt, and ketchup. Instead of being baked, slices of turbot may be fried after being prepared as above, and served with plain butter sauce.

To boil Cod.—Wash and clean it, and boil as directed for turbot. Serve it on a napkin, garnished with parsley and scraped horse-radish. Sauce—oyster sauce.

To dress a Cod's Head and Shoulders.—Take a cod's head and shoulders in one piece, which clean, and let lie among salt all night. When you are going to dress it, skin it, and bind it with tape to keep it firm. Put it in a fish-kettle, back upwards, with plenty of cold water, a handful of salt, and a little vinegar. Let it heat slowly, and boil for about half an hour. Then let it lie on the drainer across the top of the kettle, for the water to drip from it. After this, place it, back upwards, on the dish in which it is to be carried to table, cutting and drawing away the tapes very carefully. Brush it over with beat egg, strew crumbs of bread, pepper, and salt, over it, and stick pieces of butter thickly over the top. Set it before a clear fire to brown. A rich oyster sauce, made with beef gravy instead of water, and highly seasoned with Cayenne pepper, salt, and ketchup, is poured in the dish around the fish. Do not pour any on the top of the fish.

To dress a Middle Cut of Cod.—Clean the piece of cod, and make a stuffing of bread crumbs, parsley and onions chopped small, pepper and salt, a bit of butter, moistened with egg. Put this stuffing into the open part of the fish, and fix it in with skewers. Then rub the fish over with beat egg, and strew crumbs of bread, pepper, and salt, over it. Stick also some bits of butter on it. Set it in a bachelor's or Dutch oven before the fire to bake. Serve with melted butter or oyster sauce.

To boil Haddocks.—This is the simplest of all operations. Select haddocks of a middle size. Clean them well, and wash them, and boil with a little salt in the water. Twenty minutes or half an hour's boiling will be sufficient. Serve with oyster sauce.

To dress Haddocks.—This is a most delicious dish when well prepared. Take pretty large haddocks, which clean and wash well. They will be firmer and better if they lie for a night in salt. When to be dressed, wash them and dry them. Cut off the head, tail, and fins; then skin them, being careful not to tear the flesh. Cut the flesh neatly from the bone, and divide each side into two pieces. Dust them with flour, dip them into beat egg, and strew bread crumbs over them. Fry them in a frying-pan, with a sufficiency of hot dripping or lard to cover them. Be careful that the dripping is not hot enough to scorch the fish. The way to ascertain the proper degree of heat of the fat, is to dip a thin slice of bread into it, and when it makes the bread of a light brown tinge, put in the fish. If the fat be too hot, it will make the bread of a deep brown. Turn the pieces carefully, so as to brown both sides, and when done, lay them before the fire on a drainer for a few minutes. Serve in a dish, garnished with parsley. Sauce—oyster sauce, or plain melted butter.

The fat in which haddocks are fried will answer the same purpose again, if put through a hair sieve, and poured in a jar, and kept in a cool place.

To fry Skate, Soles, Flounders, Whitings, and Eels, and any other white fish.—Skate and soles are skinned and dressed in the same manner as haddocks, but soles are fried whole, not cut in pieces. Flounders are likewise fried in the same manner, whole, but do not require to be skinned. Eels must be skinned and cut in pieces.

To bake Haddocks.—Take two or three haddocks, gut and clean them, and lay them all night among salt. When to be used, skin them, and cut off the heads, tails, and fins. Make a stuffing of bread crumbs, chopped onions and parsley, and a little bit of butter. Sew this into the bellies of the fish. Rub them over with butter, strew bread crumbs over them, and bake them in an oven or before the fire.

Fish and Sauce.—Take two or three haddocks, gut and clean them, and lay them all night among salt. When to be used, skin them, cut off the heads, tails, and fins. Boil these trimmings for three quarters of an hour in a little water. Brown a little flour and butter in a stew-pan, and then strain the liquor and put it to the butter; add sliced onion, chopped parsley, salt, a little Cayenne pepper, and a spoonful of ketchup. When all this has been boiled for a few minutes, cut the fish in several pieces, and let it boil gently till dressed.

To scallop Oysters.—Scald the oysters in their own liquor. Pick them out of the liquor, and lay them in a dish, or scallop shells, or tins, strewing crumbs of bread

mixed with pepper and salt over each layer, and finishing with crumbs. Moisten the whole with a small quantity of the liquor in which the oysters were scalded, and stick pieces of butter thickly over the top. Place the dish before the fire to bake. From ten to twenty minutes will be required, according to the quantity.

DRESSING VEGETABLES.

All vegetables ought to be cooked fresh from being gathered, or as nearly so as possible. Excepting peas and spinach, each kind of vegetable should be boiled in a large quantity of water, to carry off any rankness of flavour. They should also be served as soon as dressed, and not permitted to lie a moment in the water after they are ready for dishing. All kinds of cabbage and greens are the better for being boiled with a little carbonate of soda in the water, which will preserve their green appearance. The carbonate of soda is a material resembling flour in appearance, and may be obtained from any druggist. Cauliflower and broccoli require great care in boiling, for the flower easily breaks, and their appearance is spoiled. The time for boiling vegetables depends so much on their age, freshness, and size, that no directions can be given on that point. The best way to ascertain when they are ready, is to pass a fork through the stem.

To boil Green Peas.—Peas should not be shelled till just before they are to be used. After shelling, put them into boiling water, just enough to cover them, with a little salt; and when they are not very young, put a little sugar in the water. They will require about twenty minutes to boil. When done, strain them through a cullinder, and put them into a vegetable dish with a few bits of butter; stir them gently till the butter is mixed with them.

To boil Carrots and Parsnips.—Carrots require to be scraped, and to boil till they are soft. The length of time for them boiling depends on their age and size. Small carrots are served whole, but large ones should be cut in four pieces lengthwise. Parsnips require to be scraped and prepared in the same manner.

To boil Turnips.—Old turnips require to be pared much deeper than young ones. When they are very small, peel off the skins but do not pare them; and after boiling, serve them whole, with a little melted butter in the dish. Large turnips are cut in pieces before being put in the pot, and they are either served in these pieces, or mashed with a little butter, pepper, and salt.

To boil French Beans and Scarlet Runners.—Cut off the tops and tails, and strip the strings from the backs of the pods. Then cut the pods in pieces slantingly across, or split them from one end to the other, and then cut them across. Lay them in cold water for a few minutes; and after straining them, put them into boiling water with a little salt and carbonate of soda. Boil till they are soft; strain them with a cullinder, and serve them with melted butter in a separate dish. Scarlet runners are prepared in the same manner, but usually require to be split into three or four pieces.

Potatoes.—These useful vegetables, as every one knows, may be dressed in a variety of ways. When to be presented plain at table, they may be either boiled in water or steamed. Some potatoes are best when boiled, while steaming is more suitable for other kinds. There is therefore no exact rule upon the subject. In general, they are better when they are boiled, and when put into just enough of cold water to cover them. A little salt should be put into the water to impart a flavour, and they should boil very slowly. Fast boiling will break their skins before they are soft in the inside. In most instances, they are spoiled by over-quick boiling. When sufficiently done, pour the water from them, and set them by the side of the fire with the lid off, to allow the steam to escape, or fold a napkin and place over them to absorb the moisture. Before serving, peel them, and place them in a dish with a napkin over them. Plain potatoes should never be sent to table without a napkin, for it keeps them warm, and, at the same time allows the moisture to escape. When potatoes are to be mashed, they are pared either before or immediately after boiling, and mashed so as to be completely free from lumps. Some milk and butter, and a little salt, are stirred in before serving.

Salads.—Salad is a general name for certain vegetables prepared so as to be served and eaten raw. Salads are composed chiefly of lettuce, endive, radishes, green mustard, land and water cresses, celery, and young onions. All or any of them should be washed, and placed ornamentally in a salad bowl; the lettuce is generally cut in pieces lengthwise, and stuck round the dish; the celery, also divided, is placed in the centre, and the small salads, such as cresses and radishes, are placed between. This is the mode of serving a salad plain.

A dressed Salad.—When a dressed salad is to be served, the whole is cut in small pieces, and mixed in the bowl with a dressing. The dressing is made in the following manner:—For a moderate quantity of salad, boil one egg quite hard; when cold take out the yolk and bruise it with the back of a spoon on a plate; then pour on it about a teaspoonful of cold water, and about a teaspoonful of salt. Rub all this together till the egg has become quite smooth like a thick paste. Add a teaspoonful of made mustard, and continue rubbing. Next, add and mix a table-spoonful of salad oil or cold melted butter. After this, add and mix a table-spoonful or more of vinegar. The dressing is now made, and may be either mixed with the salad, or put into a glass vessel called an *incorporator*, which is sent to table along with the salad. The top of the salad may be ornamented with small bits of the white of the egg, and pieces of pickled beet-root.

PIES AND TARTS.

Pies are of two distinct kinds—meat pies and fruit pies or tarts. Both are composed partly of paste, and therefore a knowledge of making pastry is indispensable in the economical housewife and cook. For this operation, the hands should be washed very clean, and care taken to have the board for working upon smooth, clean, and dry. A marble slab is better than a board, but few can command this convenience, and a board is usually kept for the purpose. Should the board or table be any way rough, lay a sheet of stout white paper upon it. Before commencing to roll or knead the paste, dredge a little flour upon it. In all cases of making paste, the butter, whether fresh or salt, should be perfectly free of taint, or any rankness of flavour. It is very necessary to give this direction, for many persons seem to imagine that butter of any kind, however bad, is good enough for paste. Dripping, when well prepared and kept, or lard, will answer as a substitute for butter and make the paste equally agreeable to the taste. At one time, raised pies—that is, pies covered all over with paste—were common, but these are now rarely seen of a large size for families. Pies are now made in earthenware dishes, and merely covered with paste. The way to make paste for raised and covered pies is as follows.

Paste for covering Meat Pies.—A good common paste for covering dishes or meat pies, and which paste is intended to be eaten, is made as follows: Three ounces of butter, and one pound of flour, will be sufficient for one dish. Rub the butter well among the flour, so as to incorporate them thoroughly. If the butter be fresh, add a little salt. Mix up the flour and butter with as much cold water as will make a thick paste. Knead it quickly on a board, and roll it out flat with a rolling-pin. Turn the dish upside down upon the flattened paste, and cut or shape out the piece required for the cover. Roll out

the parings, and cut them into strips. Wet the edges of the dish, and place these strips neatly round on the edges, as a foundation for the cover. Then, after putting in the meat, lay the cover on the dish, pressing down the edges closely to keep all tight. If any paste remain, cut or stamp it in ornaments, such as leaves, and place these as a decoration on the cover.

On taking pies from the oven, and while quite hot, the crust may be glazed with white of egg and water beat together, or sugar and water, laid on with a brush.

Beef-Steak Pie.—Take some slices of tender beef mixed with fat; those from the rump are the best. Season them with pepper and salt, and roll each slice up in a small bundle, or lay them flat in the dish. Put in a little gravy or cold water, and a little flour for thickening. Cover as above directed, and bake in an oven for about an hour.

Veal Pie.—Take chops from the back ribs or loin, and take out the bones. Lay the chops flat in the dish, and strew over each layer a mixture of minced parsley, flour, pepper, and salt. Add a little gravy, which may be made from the bones. Cover as above directed, and bake for rather more than an hour, for veal requires to be well dressed.

Pigeon Pie.—Pick and clean the birds well. Cut off the heads, and truss them by turning the wings on the back, cutting off the feet, and drawing the skin of the belly over the legs. Put a bit of butter, and a little pepper and salt, inside each bird. Place a single layer of beef or veal in the bottom of the dish. Lay the birds on the meat, with breasts upwards, and with the gizzards and livers round them. Some add a few whole hard-boiled eggs. Add a little gravy or water. Cover as above directed, and bake for an hour.

Icing for Tarts.—After tarts are baked, they are sometimes iced on the top, to improve their appearance. The icing is done in the following manner:—Take the white of an egg, and beat it till it is a froth. Spread some of this with a brush or feather on the top or cover of the tart, and then dredge white sifted sugar upon it. Return the tart to the oven for about ten minutes.

Apple Pie.—Pare and take out the cores of the apples, cutting each apple into four or eight pieces, according to their size. Lay them neatly in a baking dish, seasoning with brown sugar, and any spice, such as pounded cloves and cinnamon, or grated lemon-peel. A little quince marmalade gives a fine flavour to the pie. Add a little water, and cover with puff paste, as above directed. Bake for an hour.

Gooseberry Pie.—Pick the heads and stems from unripe or hard gooseberries, and rub them with a towel to clean them. Fill the dish with them, and add a considerable quantity of brown sugar, with a very little water. Cover as above directed, and bake for upwards of an hour. Some persons stew the gooseberries in sugar before putting them in the dish, in which case they require less baking.

Rhubarb Pie.—Take stalks of fresh-pulled rhubarb. Cut off all the leaf, and strip off the skins. Cut the stalks into pieces of an inch long. Fill the dish, adding plenty of sugar. Cover as above directed, and bake for half an hour. Some persons stew the rhubarb before baking; the advantage of this is, that more can be put into the dish, for it shrinks considerably in dressing.

Cranberry, Raspberry, and other Tarts.—Cranberries, raspberries, and other small fruits, may be made into pies in the same manner as gooseberries. All require to be picked and wiped, and to have sufficient sugar to sweeten them. The dish should also be well filled, and raised higher in the middle than the edges, for the fruits diminish considerably in bulk in baking.

Mince Pie.—Mince pie is a composition of meat, fruit, various spices and seasonings, and also spirits. The following is a properly proportioned mixture:—Take and mince a pound of beef suet, and a pound of roast beef, or dressed fresh bullock's tongue; also a pound of apples pared and cored, minced separately from the suet and meat; a pound of currants washed and picked, a pound of stoned and chopped raisins, an ounce of ground cinnamon, half an ounce of ground ginger, an ounce of orange and an ounce of lemon-peel, and a little salt; half a pound of raw sugar, one nutmeg grated, two glasses of brandy and two of sherry. Mix all these ingredients together, and lay the bottom of your dish or small tin pans with paste; fill these with the mince, and then cover them with puff paste. Put in the oven, and bake for half an hour. If the whole of the mixture be not used, what remains over will keep for a long time, if placed in a close jar. Some persons do not put any meat in their mince pies.

Open Tarts.—These are tarts without covers, made in flat dishes. Cover the bottom of the dish with a common paste; then cut a strip of puff paste and lay round the edge of the dish. Fill in the centre with any jam or preserved fruit. Decorate the top of the jam with narrow bars of paste crossed all over, or stamped leaves. Bake for half an hour.

PUDDINGS AND DUMPLINGS.

Care should be taken in making puddings to have the suet and the eggs which are put into them perfectly fresh. If there be any doubt of the freshness of the eggs, break each individually in a teacup, for one bad egg will spoil all the eggs in the dish. The cloths used for puddings should be of tolerably fine linen. Let them be carefully washed after using, and laid aside in a dry state, ready for the next occasion. Before putting the pudding into the cloth, dip the cloth in boiling water, and after the water has run from it, spread it over a basin, and dredge it with flour. Every pudding should be boiled in plenty of water, so as to allow it room to move freely; and it must be kept constantly boiling. It is a general saying among cooks, that a pudding *cannot be too well boiled*, and it is certain that there is much more danger of boiling it too short than too long a time. When you take the pudding from the pot, plunge it for a few seconds into a jar of cold water. This will chill the outside, and allow the cloth to be taken away without injuring the surface. The best way to dish a pudding, is to place it with the cloth in a basin, then open the cloth, and lay the face of the dish upon the pudding turn the whole upside down, lift off the basin, and remove the cloth.

Plum Pudding.—A plum pudding may be made either rich or plain, according to the quantity of fruit and spices put into it. The following is the direction for making what would be considered in England a *good Christmas pudding*:—Take a pound of good raisins and stone them; a pound of currants, which wash, pick, and dry; a pound of rich beef suet minced, and a pound of stale bread crumbs, and half a pound of flour. Mix the bread, flour, and suet in a pan. Beat six eggs in a basin, and add to them about half a pint of sweet milk. Pour this egg and milk into the pan with the suet and flour, and beat it well with a flat wooden spoon for some time. Then stir in the currants and raisins, mixing well as you proceed; mix in also a quarter of a pound of candied orange and lemon-peel, cut in thin small pieces, an ounce of powdered cinnamon, half an ounce of powdered ginger, a nutmeg grated, and a little salt. Next add a glass of rum or brandy. The pudding is now made, and ready to be either baked or boiled, according to taste. If to be baked, butter your tin or basin, and put the pudding into it, and bake in an oven for an hour and a half, or nearly two hours. If to be boiled, pour it into a cloth; tie the cloth, allowing a little room to swell if made of bread, and boil for six hours. Serve with caudle sauce.

Currant Pudding.—An excellent family pudding may be made of the following ingredients:—A pound of minced suet, a pound of bread crumbs or flour, three quarters of a pound of currants, washed and picked, a little powdered cinnamon and grated nutmeg, and a very little salt. Beat two eggs, and add as much milk to them as will wet the whole. Mix all together, tie in a cloth as previously directed, and boil for three hours. Serve with candle, or any simple sweet sauce.

Hard Dumpling.—This is the plainest of all puddings, and is sometimes served with boiled salt beef. It is also, sometimes cut in slices and placed in the dripping-pan below roasting meat, for about half an hour before the meat is dished. Take a quarter of a pound of suet minced very fine; mix it with a pound of flour; add a little salt, and wet it with water to the consistency of dough. Divide it into small dumplings, and put them into boiling water, and boil for an hour and a half, taking care that they do not stick to the bottom of the pot. No cloth is used.

Bread Pudding.—Boil as much milk as will be sufficient for the pudding you want. When it begins to boil or rise in the pan, pour it upon crumbled down stale bread in a basin. The quantity of bread should be as much as will thicken the milk to a stiff consistency. Cover it up for ten or fifteen minutes, to allow the bread to swell. Then beat or mash it up to make a fine pulp, stirring in a small piece of butter. Beat three or four eggs, a teaspoonful of ground cinnamon, a little grated lemon-peel, and sugar according to taste. Stir this among the pudding. A little brandy or rum may be added; also a few currants, if required. The pudding may be either boiled or baked. If to be boiled, put it in a well-buttered pudding shape or basin, with a buttered paper over it, and also a cloth over all: boil for an hour. If to be baked, put it into a buttered baking dish, and bake in an oven for half an hour.

Rice Pudding.—Take a pretty large cupfull of rice, pick it, and wash it well in cold water. Boil it in water for about five minutes. Drain the water off, and put it on again with as much milk as you require. Let it boil till the rice is quite soft, stirring it frequently to prevent it from burning. When done, put it into a basin, and stir in a piece of butter, or some suet minced very fine. When cold, add to it four eggs beaten, with a little ground cinnamon, grated nutmeg and lemon, and sweeten with sugar. All is to be mixed well together. It may be either boiled or baked, as directed for bread pudding. The above composition may be enriched by using more eggs and less rice, also by adding currants, spirits, and candied orange and lemon-peel.

Custard Pudding.—Take four eggs, and beat them well with two table-spoonfuls of flour and a little cold milk. Season this with sugar, ground cinnamon, grated lemon-peel, and pour on a pint of boiling milk, stirring all the time. It may be either baked or boiled. By using more eggs, the flour may be omitted.

Bread and Butter Pudding.—Cut several slices of bread rather thin; butter them on one side; put a layer of them in a pudding pan or dish, and a layer of currants above; then another layer of bread, and so on till the dish is full. Beat four eggs, with a little ground cinnamon and nutmeg, also some sugar. Add milk to this till there is sufficient to fill up the dish. Then pour it over the bread, and allow it to stand for a time to soak. It will now be ready for either baking or boiling, as directed for bread puddings.

Tapioca Pudding—Sago Pudding.—Take a quart of milk, and put in it six table-spoonfuls of tapioca. Place it on the fire till it boil; then sweeten to taste, and let it simmer for a quarter of an hour. Stir it frequently, and be careful that it does not burn. Then pour it into a basin, and stir into it a little fresh butter and three eggs well beaten; you may now pour it into a buttered pudding dish, and bake for about an hour; or, after adding another egg, boil it in a basin or mould for an hour and a half. Sago pudding may be made in the same manner.

Batter or Yorkshire Pudding.—Take a quart of sweet milk, and mix in it a large cupfull of flour, making the mixture very smooth. Beat four eggs, and strain them into the batter. Add a little salt, and mix all well together. Butter your dish or tin, and pour the batter into it. Place the dish either before the fire under roasting meat, or under meat sent to the oven. The pudding, when done, easily shakes out of the dish into another dish to be carried to table. It should have a nicely browned appearance. When dressed before the fire, either turn the pudding, or place the dish a short time on the fire to brown the under side.

Peas Pudding.—Pick a quart of split peas, that is, remove all impurities, or discoloured peas, or shells. Tie them loosely in a cloth, leaving plenty of room for the peas to swell. Boil till they are soft, which may be in from two to three hours. Take the pudding from the water and put it into a basin. Open the cloth, and bruise or mash the peas well. Mix in a piece of butter, with pepper and salt. Then tie it up tightly, and put it into the pot again, and boil for about half an hour. When ready, turn it out of the cloth into a vegetable dish. If properly managed, it will turn out whole.

Fruit Puddings.—Fruit puddings consist of fruit enclosed in a paste, and boiled. They may be made of apples pared and cut in pieces green unripe gooseberries, currants, raspberries, cherries, and other fruits. They are all made in the same manner. The best paste for them is made of beef suet chopped very fine, and flour, in the proportion of four ounces of suet to a pound of flour. Mix it into a dough with water and a little salt; then knead it and roll it out; place the fruit in it, gather up the edges, and tie it in a cloth, or place it in a basin, as directed for other puddings.

A Roll Pudding.—Make a paste of flour and dripping, or suet, as previously directed for plain paste. Roll it out flat, to about half an inch thick. Then spread gooseberry jam, or any other preserved fruit, over the paste, but not quite to the edges. After this, roll it up, and cause the outer edge to adhere. Next, roll it in a cloth, and tie the ends tightly. Boil it for an hour or an hour and a half, according to the size. When done, take the cloth off, cut the pudding in slices, and serve with any sweet sauce over it.

Meat Puddings.—Meat puddings are made in the same manner as fruit puddings, the only difference being, that pieces of beef, mutton, lamb, or veal, are placed inside of the paste instead of fruit. The meat should be seasoned with salt and pepper. One of the commonest of this kind of puddings is a beef-steak pudding. If it contain two pounds of meat, it will require about two hours and a half to boil, and if larger it will take a longer time.

LIGHT DISHES AND CONFECTIONS.

Under this head is included those various light and elegant dishes which are generally put upon the table in the last course, along with puddings and pies; also those preserves which are occasionally served at tea and supper parties. In making all articles of this description, very considerable care and cleanliness are required. The tin shapes or moulds for jellies should be kept particularly clean; if they are used with any particles of dirt inside, the jellies will in all likelihood not turn out neatly. It has been already mentioned, that the turning out may be facilitated by dipping the mould for an instant or two in hot water. It is a common belief that fruits, such as gooseberries and currants, cannot, without spoiling, be dressed for preserving, except in a brass, copper, or silver pan. This is an error. They may be

dressed equally well in a tinned iron saucepan. Every kind of berries for preserving should be gathered in sunny weather, when the fruit is as free of moisture as possible.

In the following directions, no exact definition can be given of the quantity of small seasonings and spices to be used; that is left to the taste of the cook.

Custards.—Boil a quart of sweet milk, with stick cinnamon, the rind of a lemon, and a few laurel leaves or bitter almonds, and sugar. Beat the yolks of eight eggs along with the whites of four of them; add a little milk, and strain the egg into another dish. When the quart of milk boils, take it off the fire, and strain it; then stir the egg into it. Return the whole to the saucepan, and set it on the fire again, stirring constantly. Let it come to the boiling point; then take it off the fire, pour it into a large jug, and continue stirring it till it is nearly cold. It should now have the consistency of thick cream, and is ready for being poured into custard glasses. When the glasses are filled, grate a little nutmeg over them.

Calf's-foot Jelly.—Take two calf's feet well cleaned; break them in several pieces, and put them in a saucepan with three quarts of cold water. Boil it slowly till it is reduced to about a quart and a half. Strain it, and let it stand till cold. Take off the fat carefully when cold. Put the jelly into a saucepan, keeping back the sediment; put in along with it the juice and the yellow rind of three lemons, two stalks of cinnamon, half a bottle of sherry wine, the whites of eight eggs well beaten, with the shells broken, and white sugar according to taste. Mix this all together, and put it on to boil for twenty minutes. Take it off, and let it settle with a cloth over it for a few minutes. Then pour it through a clean jelly-bag made of thick flannel. It will take some time to run; therefore hang the bag near the fire, cover it, and let the liquid run slowly from it into a jar. If not perfectly clear, run it through the bag again; but if as clear as is required, it is now ready, and may be poured into the shapes.

Plain calf's-foot jelly may be made with ale instead of wine, and vinegar instead of lemons.

Blamange.—Blamange, or Blanc-Mange—so called from its white appearance—is a jelly made of isinglass and milk. Take a quart of sweet milk, or cream, and put in it two ounces of the best isinglass. Put it in a saucepan, with the rind of a lemon, a blade of mace, and white sugar to taste. Let it boil a quarter of an hour. Take the skins off six bitter almonds and twenty-four sweet ones, and pound them to a paste with a little water. Mix this with the boiling milk, and strain it through a muslin sieve. Let it settle for a short time, and then pour it into the shape, keeping back the sediment. Turn out when cold, as already directed.

Arrowroot Blamange.—This is a jelly closely resembling the above, and is made with much less trouble. Take a quart of sweet milk, and put it all in a saucepan, excepting about half a pint. Sweeten it with white sugar. Mix about three tablespoonfuls of arrowroot with the half pint of milk, taking care to bray it all well down. When the milk on the fire boils, pour in the arrowroot, stirring quickly to prevent lumping or burning. It will become thick immediately. Let it boil for two or three minutes. Wet the shape with cold milk, and pour the arrowroot into it. Let it stand till cold, and turn out as already directed. Some persons flavour the milk in the pan with essence of lemon.

Moss Blamange.—There is a moss of a peculiar kind, found on the sea-shores of Iceland, Ireland, and other places, which is of a glutinous quality, like isinglass, and which, when boiled in milk, forms a fine smooth white jelly. The discovery of the properties of this plant is recent, and is yet not very generally known. We shall, therefore, be particular in our directions. The moss is called Iceland or Irish moss; it is sold by druggists, and when bought resembles dried sea-weed of a yellowish colour. Take one ounce (which will probably cost twopence), and pick from it all gritty or sandy particles. Soak it in cold water for about twelve hours. Take it from the water, place it in a cullinder, and drain it. Being drained, place it in a saucepan on the fire with a pint and a half of sweet milk. Let it boil for half an hour, and keep stirring it all the time, to prevent it from burning. During the boiling, sweeten it with sugar, and flavour it with cinnamon, or any other spice you please. At the end of the half-hour's boiling, the moss will be almost entirely dissolved, leaving nothing but a few thready fibres. You now strain it through a sieve, into a shape or mould. When cold, it will turn out easily, and have all the appearance of a firm blamange. This forms one of the cheapest blamanges that can be served to table; it is also agreeable to the palate, and very nutritious. In cases of a hurry in cooking, six hours' soaking of the moss will do, but this causes a waste.

Gooseberry Fool.—This is the simplest way of preparing gooseberries, and very wholesome for children. Take a quart of full-grown unripe gooseberries. Pick them, and put them into a saucepan with a cupful of water. Cover them, and let them heat very slowly. When the gooseberries are soft and dressed, but not so much heated as to burst, strain the water from them, and put the gooseberries in a dish. Bruise them to a fine pulp, with sufficient sugar to sweeten them. Let them stand till cool, and then mix milk or cream with them. Serve in a hash dish, or large bowl.

MISCELLANEOUS PREPARATIONS.

To Boil Eggs.—The boiling of eggs is a very simple operation, but is frequently ill performed. The following is the best mode:—Put the egg into a pan of hot water, just off the boil. When you put in the egg, lift the pan from the fire and hold it in your hand for an instant or two. This will allow the air to escape from the shell, and so the egg will not be cracked in boiling. Set the pan on the fire again, and boil for three minutes or more, if the egg be quite fresh, or two minutes and a half, if the egg has been kept any time.

To Poach Eggs.—Take a shallow saucepan or frying-pan, and fill it about half full of water. Let the water be perfectly clean, not a particle of dust or dirt upon it. Put some salt into the water. Break each egg into a separate tea-cup, and slip it gently from the cup into the water. There is a knack in doing this, without causing the egg to spread or become ragged. A good way consists in allowing a little water to enter the cup and get below the egg, which sets the egg to a certain extent before it is allowed to lie freely in the water. If the water be about boiling point, one minute is sufficient to dress the egg; but the eye is the best guide: the yolk must retain its liquid state, lying in the centre of the white. Have buttered toasted bread prepared on a dish, and cut in pieces rather larger than the egg; then take up the eggs carefully with a small slice, pare off any ragged parts from the edges, and lay them on the bread. They may be laid on slices of fried bacon, when preferred.

Buttered Eggs.—Put a piece of butter in a saucepan and melt it, adding a little milk. Break the eggs into a basin, and pour them into the saucepan. Season with salt and pepper, and continue stirring the eggs till they are sufficiently dressed. Serve on pieces of toasted bread.

Omelettes.—Omelettes are composed of eggs and anything that the fancy may direct to flavour and enrich them. For a common omelette, take six eggs, and beat them well with a fork in a basin; add a little salt. Next take a little finely chopped parsley, finely chopped eschalot or onion, and two ounces of butter cut into small pieces, and mix all this with the egg. Set a frying-pan

on the fire with a piece of butter in it; as soon as the butter is melted, pour in the omelette, and continue to stir it till it assume the appearance of a firm cake. When dressed on one side, turn it carefully, and dress it on the other. It will be dressed sufficiently when it is lightly browned. Serve it on a dish. The flavour may be varied, by leaving out the parsley and onion, and putting in finely chopped tongue or ham, oysters, shrimps, grated cheese, or other ingredients.

Pancakes.—Pancakes are made of eggs, flour, and milk, in the proportion of a tablespoonful of flour to each egg. To make two small pancakes, take two eggs, and beat them well, and add to them a little milk. Then take two tablespoonfuls of flour, and work it into a batter with the egg and milk; add a little salt. Set a clean frying-pan on the fire, and put a piece of butter or lard into it. When the butter is quite hot, pour in the batter. Shake it frequently, to prevent it from sticking. When the under side is of a light brown, turn it. Serve the pancakes folded, with sugar strewed between the folds. This is the way of dressing the common pancake; when required to be lighter, use more egg and less flour; and grated nutmeg may be added.

Fritters.—Make a batter of eggs, flour, and milk, as for pancakes, but with a little more flour. Apple fritters are made by cutting large pared apples in slices, dipping the slices in the batter, and frying them separately. They are done when lightly browned on both sides. Another, and perhaps more common way, is to cut the apples in small pieces, and mix them with the batter, frying them, a spoonful in each fritter. Fritters may be made with currants in the same manner. Serve all fritters with sugar sprinkled over them.

Barley Water.—This is a drink used by invalids, and is made from pearl barley. To make a quart, wash a tea-cupful of pearl barley in cold water, after which throw away the water. Put the washed barley into a saucepan with a little boiling water; after boiling a few minutes, throw this water away also. Then fill up the saucepan with two quarts of boiling water, and continue boiling until there is only one quart left. It may be flavoured with lemon or jelly.

Gruel.—Gruel for invalids is made either from grits or from oatmeal. A pint may be made as follows:—If from grits (called in London Embden grits) or groats, put on about two tablespoonfuls in rather more than a pint of water; let it boil for at least two hours. When boiled, strain it through a hair sieve. If from fine oatmeal, such as is sold in England, take about a tablespoonful and a half, and mix with it gradually about a pint of cold water, braying it as you mix, and boil it for half an hour. It is now done, and requires no straining. If the oatmeal be coarse, such as is used in Scotland, take a tea-cupful and put it into a basin. Mix it well with a small quantity of water. Pour this water off, then take another water from it: in this manner about a quart should be taken, the coarser particles of the meal being rejected. Put all the waters into a saucepan, and boil for twenty minutes, stirring the whole time. It is now ready, and, like other kinds of gruel, may be seasoned according to taste.

Lemonade.—Take a quart of boiling water, and add to it five ounces of lump sugar, the yellow rind of a lemon rubbed off with a bit of sugar, and the juice of three lemons. Stir all together, and let it stand till cool. Two ounces of cream of tartar may be used instead of the lemons, boiling water being poured upon it.

To boil Rice for Curry.—It is customary to serve boiled rice along with dishes which have been seasoned or stewed with curry. When rice is required for this purpose, it should not be soft or pulpy as in boiling for puddings; each grain should retain its perfect individual form, though swelled to nearly its fullest size. After picking and washing the rice, put it into boiling water, and let it boil smartly for about twelve minutes. Just before taking it out, put in a tablespoonful of salt. Drain the rice in a cullinder; then shake it gently out upon a doubled cloth, and lay it before the fire for a few minutes, with a fold of cloth over it. By this process the water will be absorbed from it, and it will be ready for dishing. Pour it lightly into the dish.

To make a Stuffing.—Roast veal, fowls, turkey, and some other things, require a stuffing. These stuffings have been alluded to in various recipes in the preceding pages, and may here be expressly defined. Take a quarter of a pound of the crumbs of stale white bread, a quarter of a pound of chopped beef suet or marrow, as much chopped parsley as will lie on a tablespoon, about half a spoonful of chopped sweet marjoram, and a little grated lemon peel, pepper, and salt. Mix all these, thoroughly together, with one beat egg and a little sweet milk. This forms a species of dough in sufficient quantity for a small turkey or large fowl.

Force-meat Balls.—These are balls formed of stuffing, used as a garnish for roast veal or veal cutlets. Make a stuffing like the above, but instead of being wet with one egg and milk, wet the mixture with two eggs. Roll the dough into small balls, about the size of nutmegs. Roll them in flour, and fry them with a little lard, butter, or dripping. When required to be more savoury, the composition may be enriched with a little chopped ham, tongue, or sausage meat.

POLITICAL ECONOMY.

"Political economy," says Wayland, "is the science which teaches the manner in which nations and individuals acquire wealth."

Wealth is a general term applied by mankind to any object or thing, no matter of what character, that possesses an inherent value, as diamonds, gold, silver, grain, goods and merchandise of every description.

The acquirement of wealth is one of the first objects of the human mind: how wealth may be produced is consequently one of its first questions.

Wealth can only exist where its subject possesses an inherent value, and it exists only in proportion to the quantity of that value—great, where it is great; and small, where it is small. The value of an article depends not upon the estimation in which it is held by its owner, but upon what other persons may offer in exchange for it: when, and then only, its value becomes determinate, and the article rises or falls as the case may be, to an equal value with that of the article offered in exchange. This brings us to the consideration of *price*. Price is whatever amount of money an article will command in the market; and it only becomes what is entitled *current price*, when the owner of the article is sure to obtain it whenever he offers his goods for sale.

The re-creation of objects under another and more useful form may be defined to be production, for the value mankind attaches to any object arises only from the fact that they can make some use of it; otherwise it would be valueless. Whatever, therefore, is useful is valuable, but the amount of its value can only be estimated by the extent of its utility, for there can be no real production of what is called wealth without an augmentation of utility.

OF THE VARIETIES AND NATURE OF INDUSTRY.

The usefulness of an object is increased in proportion to the amount of labour bestowed upon it. The application of this labour to the object is called industry Whatever objects are destitute of exchangeable value—objects not procurable by production, nor capable of being destroyed by consumption, as air and light—do not belong to the science of which we treat. There are others, however, equally as indispensable as these, such as the articles which constitute the food, raiment, and lodgings of man, which he could never enjoy except through the means of his own industry. This industry is of three kinds—*agricultural*, where it is applied to the production of natural products; *manufacturing*, where it re-creates the products of nature and fits them for the uses of man; or *commercial*, where it places in our reach objects of utility which we could not otherwise obtain.

Whatever industry furnishes for the use of man are entitled *products* and these products are rarely the fruits of any one particular branch of industry: on the contrary they may employ two, or all the branches. For instance, agricultural industry produces wheat, but manufacturing industry changes it into flour, while commercial carries it where it may be rendered more useful than it otherwise would have been.

OF CAPITAL.

Human industry, however great, when unassisted is insufficient to invest things with value. Man requires, first, tools and implements; secondly, those products which are necessary to sustain life, and lastly the raw material, to be fashioned into products by that industry. Raw materials are sometimes furnished gratuitously by nature, but they are oftener the products of previous labour in some of the branches of industry, as iron from the mine, wheat from the farmer, or articles brought by commerce from some other section of the earth. This brings us to the consideration of *capital*, which may be defined to be the value of the various articles employed in the production of a product. Capital is either *productive* or *unproductive*, *fixed* or *circulating*.

Whatever produces is productive capital; whatever is idle and useless is unproductive. Money, for instance, may be either. When employed in commercial industry, in the transportation of products from one country or place to another, it is the one; when locked up in the chests of a miser, the other. Money, however, is of small importance in political economy, for neither the merchant's, manufacturer's, nor farmer's capital consists wholly of gold or silver: on the contrary it is the least portion of it. The capital of the first consists in his goods and his ships; of the second, in his machines and manufactories; of the third, in his farms, manures, implements of husbandry, and other articles of agricultural utility Indeed, all hesitate at possessing more of it than is sufficient for their actual use.

The capital of government is that of individuals, for it is made up of what is possessed by individuals under its care. The circulating medium of a nation, however, is small when compared with its actual wealth, for while the gold and silver coin of a country may amount but to twenty millions of dollars, its fixed capital may be one hundred times that amount.

OF NATURAL AGENTS.

Natural agents are those which are not created by man, but which he avails himself of in the production of products, as, for example, land; it is in the nature of land, with the assistance of the sun, air, and rain, to produce crops; but land would produce nothing unless prepared for the purpose by the plough, the harrow, &c., pre-existing products by which the labourer is enabled to employ the natural agents to advantage, and which, as has been seen, form a considerable portion of his capital. Fire, air, water, and other natural agents, and the union of these with others, enable the labourer to produce more than he otherwise could do, were he unassisted by them. Wood, for instance, when joined to fire, naturally produces heat; heat when applied to water generates steam, and steam is daily used not only for manufacturing but commercial purposes to greater advantages than any other agent. The same may be said of water alone, which is employed in the irrigation of lands, or in forcing machinery, where steam would be too costly an agent, or of air, or rather of wind, which, by means of sails employed for the purpose, will propel the machinery of a mill for manufacturing purposes, or a ship from one place to another, with the assistance of water, for commercial. As may have been gathered, natural agents form a prominent part in the production of wealth.

HOW INDUSTRY, CAPITAL, AND NATURAL AGENTS CONCUR IN PRODUCTION.

It is not necessary that these three requisites should be united in one person, on the contrary, they may be divided.

One possessing land may lend it to one possessing capital, while an industrious person may lend his indus-

try to the latter or to the former, should he possess both capital and land.

Whenever any one of the three is lent, for they must all unite in the production of what is valuable, its use, being likewise so, demands an equivalent, which, in the case of land, is rent; capital, interest; and industry, wages.

Industry and capital, however, can sometimes act without land, but this is generally when articles of foreign cultivation only are employed, as is the case with American cotton in the factories of Europe. The use of land, therefore, is not absolutely necessary.

OF LABOUR, NATURE, AND MACHINERY.

Labour is human action exerted to increase the value of whatever is susceptible of industry; and wherever it is employed, is always productive, for labour which produces nothing is but folly, and not likely to be attempted by any one a degree removed from a fool. It may be divided into two kinds, the *labour of nature* and *of capital*, both of which are closely related and too often confounded; for tools or machines, which are actual capital, are mere expedients, the better to effect an object by means of natural resources. The object of tools and machines is to enlarge the power of production, that is, to enable one to do more than he otherwise could do unassisted by them. They consequently supplant human labour, for where an engine managed by one will perform as much labour as a hundred, ninety-nine must be thrown out of employ. This is often the cause of an outcry against machinery, the use of which has frequently been prevented by violence, and almost as often by the intervention of laws. Machinery, however, is productive of great good, for, as a necessary consequence, that which can be made cheaper can be sold cheaper, and is therefore capable of a wider circulation. Besides, it is useless to clamour against, or to prevent the introduction of machinery, for if destroyed here, they will be employed elsewhere, where a more liberal policy is adopted, and their products imported into the country will be bought, because they will be more uniform and better in character as well as cheaper, in preference to those made by hand, when the labourer will be as much out of employment as if they were in use in his vicinity. Besides, had they been in use, the greater amount of the products manufactured, in consequence of their wider circulation, would have employed as many hands as before.

Division of Labour.—Labour is capable of infinite division, for it is rarely that we find all the requisites necessary for the performance of a task united in the same person; the manufacture, therefore, of almost every article, is divided among those who are best capable of performing their several parts. For instance a book: the type-founder casts the type, the compositor sets it, the pressman prints it, when it passes into the hands of the book-binder, in whose establishment the labour is again subdivided. Now could one man perform all these parts, the time occupied in the preparation of a volume would be so great that its value would be materially increased, indeed, so much so, as to place it beyond the reach of the mass. By dividing the labour, however, and suffering each man to perform that part which he best understands, the product is produced in less time, in greater quantities, is far cheaper, and as a necessary consequence, is capable of greater circulation. Agricultural labour, however, is incapable of much division, for it is almost impossible to collect a sufficient number of agriculturists in one spot, and equally so to unite them in the cultivation of one particular product. Besides, agriculture does not permit a permanent occupation in any one thing: a man cannot always be ploughing, digging, sowing seed, or reaping, for each of these things have their separate seasons. Neither will land allow itself to be permanently used in the production of a particular kind of crop, for such a course would produce exhaustion, and the land itself finally become worthless.

Commercial Industry.—Commodities which are the subjects of commercial industry, depending as they do upon the varieties of soil and climate, are as diversified in their character as in their locality, and they are only abundant in those situations which nature has best adapted to their production. The transfer of commodities from one place where they are less, to another where they are more useful, is commercial industry.

Commerce is of three kinds, external, wholesale and retail; external, where the home market is supplied with foreign products or *vice versa*; wholesale, where larger quantities of merchandise are purchased for the purpose of vending them to inferior dealers, and retail where those inferior dealers resell to consumers. And here is a subtle division: all products bought for the purposes of sale are entitled merchandise; those for consumption, commodities.

Commerce is conducted by various persons, as the commerce of money in specie, whether in silver and gold or paper, as well as dealings in credit, is by the bankers; while the broker brings buyers and sellers in conjunction.

No matter how small or how large may be the agency of persons employed in commerce, each one possesses an equal degree of importance, for, though the merchant may import a cargo of tea from China, the retailer who sells his customer a single pound, is quite as indispensable to him. The only reason why this office both of wholsaleing and retailing is not performed by one is because it can be better and more efficaciously done by two.

Transportation increases the value of an article, but only so far as the cost of that transportation extends; as, for instance, where an article is sold in Philadelphia at ten cents per pound, and it costs one cent to transport it to New York, the transportation increases its value to eleven cents. But the transportation of products cannot be effected without the employment of a variety of means and persons, all of which have a value depending upon their extent and their services. For instance, there are two establishments, the one to forward, the other to receive goods, without any mention of the cost of package and warehousing; besides agents, insurers, brokers, carters, &c., to be recompensed. All of these occupations are, of course, productive, for without their agency, the consumer could never reach the products. Whatever, of course, lessens the power and increases the facilities of transportation lessens the price of a product, as when steam is used instead of horse-power by means of a railroad, or a canal in place of a wagon. These principles apply equally to external or internal commerce.

The internal commerce of a country is always more considerable than the external; this proposition may be doubted, it is nevertheless true. Take, for instance, any large entertainment, examine the articles consumed, and those of foreign growth will be found few and unimportant in comparison with those produced at home. It is, however, not more advantageous than the external, for were it so, the capital employed in one would be drawn to the other, and we should soon have no foreign commerce at all.

A still greater branch of commerce remains to be considered, that entitled the trade of speculation, which is purchasing goods at one time and re-selling them at another when a sale will be more advantageous. Even this trade produces, for it employs capital, ware houses, and care in preserving the goods or articles, and human ingenuity in taking a superabundance from a market where their value is depressed, to use it again when that value shall have increased. This branch of commerce, when it is employed in the purchase of the whole of an article, is entitled, *forestalling*. The carrying trade is another branch of commerce, and is the purchase of commodities in one country for re-sale in another, but it is only suited to

nations of large capital and redundant population; for where a nation is small and its capital limited, the whole of that capital should be employed in cultivating not its external but its internal resources.

OF THE CHANGES OF CAPITAL.

Our next consideration is the various transformations undergone by capital during the progress of production. The amount or extent of these transformations is of very little importance: they may be carried on *ad infinitum*, provided, however, that each transformation effects a proportionate increase in the value of the article operated upon: in other words, the change must pay for the labour given to effect it. An immense addition of value may be given to an object by a proper application of industry. Take, for example, check-springs, used in arresting the balance-wheels of watches. They are made of steel. This steel, however, was originally iron. Let us make a calculation. A pound of iron costs five cents. The manufacturer works it up into steel, of which the springs are composed. "Each of these springs," says Alagrotti, "weigh the tenth part of a grain, and are sometimes sold as high as three dollars." A pound of iron, allowing for loss of metal occurring in the progress of manufacture, will make 80,000. Multiply that amount by 3 and you have a capital originally but five cents, increased to one of $240,000. The same principle applies equally to agriculture, manufactures, and commerce. Let us look at an every-day change undergone in the latter branch of industry. A shipping merchant of London, possessing a surplus of specie is desirous of rendering it productive. He invests it in [illegible], and ships that flour to Rio Janeiro. During the voyage, however, a portion of his capital passes into the form of wages for his crew. On his arrival there he sells his cargo, and immediately invests the proceeds in hides and coffee, which are again converted into money at Charleston, and immediately re-invested in cotton, which forms the return cargo. Cotton is extensively used in manufacturing, and commands a ready sale; so at last the merchant, after all these transformations, receives his capital again, most probably with a very large increase, in its original form of specie.

OF THE MULTIPLICATION OF CAPITAL.

Productive capital, no matter how employed, notwithstanding its frequent changes, is always the same. It may, however, be equal; or inferior as well as superior in amount; equal, when the capital has merely resumed its former position; inferior, where the capital has been encroached upon, and superior, where it has steadily increased in the progress of its transmutations. This increase, of course, enables the holder to multiply his operations, for it is, in fact, so much additional capital; that is to say, his capital has increased as much as the surplus may be. This surplus may again and again be multiplied in the same way and to any extent, and it is the only proper process of augmentation, for were this surplus spent in riotous living, it would be destroyed in a single week, or perhaps month, as the case might be. But this destruction must be not understood as affecting the capital itself; it does not; it only affects value—which has gone out of existence without re-production. The re-employment of capital in the production of additional products is the proper and only way of increasing individual wealth, as well as of increasing the wealth of a community. But more products must always be created than have been consumed in their creation, otherwise there can be no saving, and as this saving or increase forms the ground-work of a perpetual annual profit, not only to the person saving it to all whose industry is set in motion, it ought always to be practised and encouraged, and, indeed, hailed as progression toward national prosperity

OF UNPRODUCTIVE CAPITAL.

Unproductive capital has already been described; it is, of course, the converse of productive. The non-employment of capital, by keeping it in an unproductive position, is a great evil, since it can do no good either to the possessor or those around him. Whether the amount be buried or concealed, or employed in the decoration of buildings, or in the mere ornament of the person, its unproductiveness is alike injurious, for it deprives not only the individual, but the nation of an increase of revenue, in itself an additional capital, which might of course produce again and again.

OF IMMATERIAL PRODUCTS.

An immaterial product is one where the value is consumed at the precise moment of production, as in the case of a physician in attendance on the sick. He examines the character of the disease, prescribes a remedy, and takes his leave without depositing any thing which is capable of transfer to any other person. His industry, however, has not been unproductive; he has possibly succeeded in preserving his patient's life. A product like this is certainly an object of exchange; the physician's advice was given for his fee, while the act of rendering that advice was its production, and the hearing it, its consumption; both consumption and production were simultaneous.

OF THE RIGHT OF PROPERTY.

Property, in the first place, was undoubtedly acquired by labour; indeed it could not have been acquired any other way. Originally held in common by all mankind, whoever first occupied it undoubtedly possessed the right to do with it what he chose. On his leaving it, his right ceased, and it again became common and susceptible of occupation, while the next comer, no matter whom he might be, could as readily enter on and possess himself of the land as any other person in the world. This state of affairs, however, was incapable of long continuance. As the world became more populous—men are always gregarious in their natures—each one, who had entered upon land, felled the trees and otherwise improved it, insisted on his right to continue that ownership which was undoubtedly, first, the product of his occupation, and afterward of his labour.

Wherever property exists, whether it consists of land or goods, the laws should protect the individual in his possession of it, for where they do not, what security has any one that his rights may not be invaded and he dispossessed of what it has cost him so much labour to acquire. Wherever a man is not protected in his property, as is the case in despotic governments, he has no incentive to labour. Why should he have? For any one, nay, even the government itself, might have watched him during his task, and the moment it had arrived at a state of completion, stepped in and possessed himself, or itself, of the fruits of his toil. Such governments and such countries are universally poor; while, on the other hand, those which cover the meanest individual with the same measure of protection that they extend to the noblest—countries like England, and our own beloved America—are ever the most wealthy; for protection of production always increases its growth. The right of property, however, may be as much invaded by obstructing the possessor in his enjoyment of it, as by actually dispossessing him of the property itself. Landed property, for instance, may be interfered with, by government prescribing certain modes of tillage; property in money, by prohibiting certain ways of employing it; and property in their own industry, where [illegible] exercise of a people's particular faculties and talents [illegible] restrained or prevented from having their full [illegible] effect. Taxation, when it transcends proper [illegible] produces the same result, for value can only be [illegible] upon such things as are productive and are valuable in themselves. The right of property, therefore, should always remain inviolate.

ON THE DEMAND FOR PRODUCTS.

It may be laid down, and that, too, as a general principle, that the greater the number of producers and the more various the productions of a country, the more prompt is the demand, and the more numerous and extensive are the markets for its productions, while, at the same time, they are more profitable to all concerned, for price increases in proportion with demand.

Each individual in a community is interested in the prosperity of the rest of its members, for the success of one branch of labour tends to promote that of all the others, for, no matter what line of business a man may be in, he finds employment more easily and is better paid for his labour when every one else is thriving around him. The same principle applies as well to external as to internal traffic, for where a country occupies a position contiguous to rich and industrious neighbours, it is of injury to its internal industry to purchase productions from them; for nothing can be bought from them except by exchanging what it itself produces for what its neighbours produce. Even where foreign produce is purchased with specie, that specie is almost always first obtained in exchange for our native productions somewhere else, for silver and gold are not always national products. But the mere consumption is not always beneficial to commerce, for the difficulty lies not in exciting the desire for consumption, but in supplying the means, which can only be furnished by production. A good government invariably stimulates labour, for labour increases production as the demand for products is proportioned to the activity with which they are produced.

OF BENEFITS ARISING FROM THE RAPID CIRCULATION OF MONEY AND COMMODITIES.

"Values engaged in actual production," says Saye, "cannot be realized and employed in production again, until they have arrived at the last stage of completion and been sold to the consumer." This is true. The sooner, therefore, an article is completed and sold, the sooner can the capital invested in that product be applied to the formation of a similar production. The rapidity with which this is done is productive of substantial benefit. Capital is always employed in production. It is here engaged but a short period, thereby causing a saving of interest to the capitalist as well as a saving in the charges of production.

There is no difference between the circulation of money and goods: the same principles apply to both. Money lying idle in a miser's chest is as inactive as the goods slumbering on a dry-good merchant's shelves: both should be circulated as soon as possible, and the latter, when of a perishable character, should be got rid of even at a partial loss, for it has always been considered wiser rather to lose a part than the whole.

OF THE EFFECT OF GOVERNMENT RELATIONS WHEN INTENDED TO INFLUENCE PRODUCTION.

Government, in the abstract, can do no act but what in some way or other affects production: nevertheless, it sometimes aims at a direct influence. The object in such an aim is twofold; either to prescribe the creation of certain particular kinds of produce, or to direct particular modes of production.

Those kinds of products more in demand by society pay better than others that are less cared for; the profits are consequently larger. When government at such a time intervenes and directs the attention of the producers to another production which is less desired and pays a less profit, it undoubtedly calls the producers of the country from a source of great to one of less profit. Such a course, when adopted, is always the result of ignorance, for that which produces most is the most beneficial to a government and its people. The same rules apply as well to agriculture as to commerce, for the agriculturist and the manufacturer, possessing a daily acquaintance with the details of their business, must know better what is to their advantage than the government, which can only arrive at a knowledge second hand, and, besides, is liable to misinformation. But, what, it will be asked, is the cause of the interference of government? By the way, governments throughout the world have interfered oftener with the external commerce than the agricultural interests of their several countries. The cause of the interference of government is a system entitled the *exclusive* or *mercantile system*, which always, but erroneously, attributes the profits of a country to what is generally called its

BALANCE OF TRADE.

The balance of trade, says the English translator of Saye, is the comparison a nation makes between the value of its exports to, and that of its imports from, foreign countries. When it has exported more merchandise than it has taken in, the country receives the difference between the amounts in money; then the balance of trade is in its favour, but with the converse, it is against it.

OF THE EFFECT OF REGULATIONS, FIXING THE MANNER OF PRODUCTION.

Whenever public authority interferes in the details of agricultural productions, that interference is generally beneficial. But it is only so where government confines itself to the granting premiums and offering encouragements, or to the diffusion of useful knowledge on the subject. On the other hand, no branch of industry has suffered so materially from interference, as has that of manufactures, governments generally limiting the number of labourers in each branch, either by directing them to remain in one trade, or by exacting certain particular terms on which they can alone carry on their business. Such a course of conduct gives rise to chartered companies and incorporated traders. The effect of this is easily seen. A monopoly is at once created, which tends to the benefit of the privileged few while the consumer pays for it. The whole system is a bad one. Labour, to be productive, should always remain untrammelled, for, after all, self-interest is the profoundest of instructors, while every restraint imposed by legislation upon the freedom of human action inevitably extinguishes a portion of the energies of a community, while it never fails to abridge its yearly product.

PRIVILEGED TRADING COMPANIES.

Companies of this kind do not exist in America, neither is it right that they should, for possessing, as they generally do, exclusive privileges, either in buying or selling certain particular articles, or in holding the monopoly of trade with some particular country, they would wield the power they hold of elevating the prices of their goods far beyond what they possibly could arrive at under the present state of affairs, where trade is free to all of our countrymen who choose to embark in it. The operation of such companies is to compel the consumer to pay more for an article than it is actually worth. It is supposed by some that a company, having the exclusive privilege of manufacturing a certain article, or of importing a certain kind of produce, may purchase either its materials or its merchandise at a less price. But, even this is to be taken with some considerable allowance, for the rule can only apply against the people of the companies' own government, and not those of others, who have the right to, and do compete with such associations, whenever it is their interest to do so. It will be seen therefore, that the above supposition is fallacious, and that while a privileged company does not possess the power of affixing a specific price on any article of foreign growth or ma

nufacture, in buying, it does possess both power and right to say what that article shall sell for at home, for no one is allowed to interfere with its peculiar branch of trade. Companies, therefore, always fix exorbitant prices upon every thing they have to sell. This, too, another evil feature, is no gain to the nation, for the price of every article is taken, not from strangers, but from the nation itself. Such companies, therefore, should always be discouraged.

OF THE EFFECTS ON NATIONAL WEALTH, ARISING FROM EFFORTS MADE AT PRODUCTION BY PUBLIC AUTHORITY.

It may be taken as a general principle, that there never can be any production of new value, therefore no increase of wealth, where the product of a productive concern does not exceed the cost of production. Whether government or individuals be the adventurers in a losing concern, at the same time that it ruins the nation, it leaves proportionably a less amount of value in the country. When the concern does not support itself, the receipt of course is less than the outlay, while the difference between the two, falls always on those who supply the expenditure of the government—the tax payers. Whether the state does business with its own private funds, or with the produce of the national lands, the result remains the same, for whatever is thus wasted, might have lessened the amount of the public burdens.

The manufacture of the Gobelin tapestry in France, owned and carried on as it is by the government, is an instance of a losing concern. Independent of the loss that almost always occurs to a government that embarks directly in trade or manufacture, and of course to the nation, such a course is always productive of greater evils. We instance one: the productive efforts of a government always counteract, if they do not destroy individual industry. A government is always a dangerous rival, for while it has unlimited means at command, it possesses but little care for its own interests. Whatever a government consumes, had always better be obtained from individuals, who can ever undersell, and of course supply cheaper, than the government itself can manufacture. There are some exceptions, however, to this proposition, the building of national vessels or arms, for example, with other things of like character, which a state of necessity keeps in its own hands. Arms, however, are generally purchased from individuals, and always with benefit to the state, which is compelled to act by deputy, or by the agency of a set of men whose interests directly oppose its own. In consequence it is invariably cheated.

OF EMIGRATION.

Emigration to a nation, whether temporary or permanent, ought always to be encouraged, for it invariably assists to increase the aggregate of its wealth. Not, however, to the total amount brought by the traveller into a country, for of course he receives value which he consumes in exchange for what he brings with him, but only as far as the per centage of profit on the principal may extend. A stranger, whether he be rich or poor, is a valuable acquisition to a nation. If rich, he brings with him both industry and capital, valuable auxiliaries, and if poor, industry alone, which, properly employed, will be advantageous not only to himself, and those around him, but to the nation itself, for as we have shown again and again, industry must necessarily produce, and production is almost always the production of value.

Emigration from a country, on the other hand, is as much a total loss to the one left as it is a gain to the one chosen. It is so much industry and capital gone for ever. The best mode of attracting and retaining citizens, is to treat them with kindness, justice, and benevolence; to protect every one in the enjoyment of those rights which he most reverentially regards; to allow him the free disposition of person and property, and of speaking, reading, and writing his sentiments in the most perfect security.

MONEY.

In society no one produces all those things which are necessary to supply the total of his wants. Indeed, it is rare that we find one able to create a single product. He must necessarily, therefore, procure whatever else he requires through the medium of exchange. He must first, however, create a sufficiency for his own use. This he always does, for individuals keep but a small portion of what they grow or create themselves; the rest they exchange.

Exchange and transfer have been erroneously thought the basis of wealth; they are, however, at best but secondary and accessory circumstances, for were each person to raise for himself all the objects of his consumption, as is the case in some of the remote western settlements, society might exist for ever, without a single instance of either. Both, however, are indispensable where civilization is at all advanced.

Insisting, then, on the necessity of exchange, what difficulties must arise if every one was compelled to exchange his products specifically, for instance, the bootmaker his boots for bread, the cutler his knives for cloth, the manufacturer his cloths for wheat, and so on *ad infinitum*. One might not want the articles the other was willing to exchange, but something else, and so on as before. There must then, of course, arise some commodity—for which all will exchange under any circumstances—which is always the representative of a fixed value, and one, too, not liable to any great degree of fluctuation. *Money* is exactly that commodity.

It is in constant demand on account of its inherent utility. It is always readily received in exchange, and it is capable of infinite subdivisions. Besides, it has two particular qualities which give it a general preference in value to the same amount of value in any other shape: First, its aptitude as an intermediate object of exchange to assist all who have any exchange or purchase to make toward the particular object of request; and secondly, its capability of subdivision and precise apportionment to the exact amount of the intended purchase or exchange, which capability is the strongest recommendation to every member of the community. Money becomes the more requisite the more a nation advances in civilization and the further it carries its division of labour, for, as has been seen, individuals rarely produce more than a part of one article; as, for instance, where a man makes not the whole of a watch, but a part of it only, its springs. These he is compelled to exchange or barter to supply himself with the necessaries of life, as bread, meat, clothes, &c.

The choice of the particular article that is to act as money, depends upon custom; it may be any thing, as shells, &c.; but in civilized communities it is generally gold and silver. It passes current like any other article, and people are at liberty to barter their goods for it, or in kind, as may please themselves. The single reason why it is preferred, is because it is more readily disposed of in the same way than any other. Dollars derive their circulation as money from no other authority than this preference, and if there were the slightest ground for any one's imagining any thing else would pass more currently, that other article, whatever it might be, would usurp its place the moment the fact was discovered. Custom, therefore, and not authority, prescribes what shall pass exclusively as money, let the latter be of what commodity it may. The frequent interchange of money for commodities has attached special terms to the transaction, as where one receives it in exchange for the act is

called SELLING; where he gives it in exchange, BUYING. And in this way commenced the use of money.

THE MATERIAL OF MONEY.

The material of money is of no great importance, as it is neither used as an article of household utility, food, nor attire. It is not capable of consumption, for it passes from hand to hand without any perceptible diminution. It is, therefore, of little importance whether it be gold or silver, parchment or paper. All that is requisite in it is the possession of some inherent and positive value, for no one would be fool enough to exchange that which was valuable for that which was not. Gold and silver possess both these requisites in an eminent degree, which has caused them to be universally adopted. The reasons of their fitness are simple. They are capable of minute subdivision without any sensible loss, so that the quantity may be easily adapted to the value of the article bought. They have the same quality everywhere, a grain of gold being the same either in Asia or America. Neither age, weather, nor wet can deteriorate them, and the relative weight of one determines the weight and value of another specific portion, four grains of gold being worth just twice as much as two. Their scarcity and dearness, besides, are not so great that the amount of gold or silver is too small for common use, and they are not sufficiently abundant and cheap as to make a great value amount to a great bulk or weight; while they are sufficiently malleable to allow them to receive a stamp or impression which certifies the weight and value of the price, and its proper degree of purity.

All money, however, is not pure; on the contrary, some meaner metal is always used with it, which lessens its value and which is called *alloy*. This alloy, however, is worthless, for the value of the coin depends not upon it, but on the quantity of the more precious metal used in its formation.

OF THE ACCESSION OF VALUE GIVEN TO A COMMODITY BY GIVING IT THE CHARACTER OF MONEY.

It has been seen that money is indebted for its currency not to government or authority, but to the fact that it possesses a particular intrinsic value. Its preference, however, as an object of barter to all other commodities of an equivalent value, is owing to its character as money. Every one must possess it, for none can exist without its use. But to proceed: The adopting any specific commodity and making it serve as money augments its value as an article of commerce. A new use being found for it, it becomes more in request, while the employment of the greater makes the lesser portion dearer than before. The use of the precious metals in manufacture therefore increases the value of the proportion that remains, while the non-use would render them cheaper, that is to say, it would take a larger amount to purchase the same quantity of merchandise when they were not employed in manufacture than it would do when they were being made up into plate, jewelry, and other articles of use or ornament.

The choosing any commodity to act as money in one section of the world, makes it dearer everywhere else, for another use immediately arises, that of exporting it where it is found more valuable. But specie, as money is often called, is subject to the same fluctuation in value as other commodities: it rises and falls according to the demand or supply. The demand for specie sometimes becomes so great as to induce the formation of what is called *paper money*, which is used as the representative of an equivalent amount of gold and silver. The *paper money* of this country, as well as of the nations of Europe, furnishes an excellent example.

OF COINAGE.

The precious metals receive an additional value from impression and coinage. Acting as money, they must necessarily pass from hand to hand. This passage is of hourly occurrence. What difficulties and delays in business would constantly arise if the seller of goods were compelled not only to provide himself with scales to weigh the amount of metal he would daily receive, and what blunders would occur from ignorance, awkwardness, or defective implements?

Metals, and here governments interfere, are reduced to an established standard, and divided into pieces of an established weight by the process of coinage. This, we have said, gives the bullion an additional value. The reason is plain, the new dress in which the metal appears saves the owner not only the cost of weighing and assaying, but the loss of labour and time such a course of procedure must create.

OF THE ALTERATION OF STANDARD MONEY.

Public authority, taking it upon itself to fix arbitrarily the commodity that shall serve as money, should never alter it, except in cases of absolute necessity, for it can neither raise nor depress the value of money without oversetting every thing like order and regularity; the value of goods always adjusting itself, not to that imaginary one authority may please to affix to them, but to the real value naturally and always attached to the article, money, by the conflicting and constant influence of demand and supply. Besides, such a course of procedure inflicts the most injurious effect on credit, commercial integrity, and industry. Carried to any considerable extent, it would destroy all commerce whatsoever.

WHY MONEY IS NEITHER A SIGN NOR MEASURE.

Money would be a mere sign or representative had it no intrinsic value of its own. On the contrary, in sale or purchase, the latter is the only thing considered. When an article is purchased for a dollar, neither the impression nor the name is offered or taken in barter, but the quantity of silver known to be contained in it. For instance, were government to coin pieces of brass, calling them dollars, they would be considered only as brass and not as silver. Their value as brass would be the only thing regarded, and it would take a much larger number to purchase the same amount of goods than it would of the coin of the former capacity of value.

OF A FIXED RATIO OF VALUE BETWEEN METALS.

The government of France when it sought to fix the relative value of metals and commodities, committed another error,—that of attempting to determine by act of law the relative value of metals acting as money, one to the other. It was an arbitrary measure, but it legally established the ratio of the nominal value of gold over that of silver. What has been the consequence? The relative value of the two metals to other commodities has been constantly fluctuating, as has also the relative value of the metals themselves, exchanged one with the other. It may be taken, however, as a fixed principle, that it is impossible in practice to assign any fixed ratio of exchangeable value to commodities whose ratio is always fluctuating; gold and silver must consequently be left to find their natural level.

OF COPPER COINAGE.

Copper coin, in the strictest sense, is not money, although it generally passes as such. In most of the countries in which it is issued, it is not a legal tender, except in such minute sums that their amount cannot be offered in gold or silver. Indeed, it is little more than the representative of a certain amount of silver too trifling to pay for the coinage. The government that

issues it should always be prepared to redeem it with silver, and should always do so on demand; otherwise, if it proceeds in coining, an excess is sure to follow beyond the wants of circulation. This would certainly place it at a discount, and every one holding copper coin would be anxious to get rid of it on any terms in exchange for gold and silver.

OF THE FORM OF COINED MONEY.

Coin suffers a diminution in value, corresponding to its extent of surface. Of two pieces of equal weight and value, that which offers the smallest portion of surface to friction will suffer least from being used as money. A flat cylindrical form has been adopted by most governments for this purpose, because it is best adapted to prevent loss. The less the cylinder is flattened, however, the better, and the piece should be thicker than broad.

As to the impression on the surface, it should be low, and if possible, an alto-relievo. This form of impression, however, can only be used where the coin is proportionably thick; it being liable to break. A basso-relievo form has been generally adopted.

OF REPRESENTATIVES OF MONEY.

1. *Bills of Exchange and Letters of Credit.*—Both of these, with promissory notes and checks, are obligations in writing, promising to, directing to, or causing to be paid, a specific sum of money at a certain time, either in the town or country in which they are issued, or at some other place. Such affairs, having an actual and present value, are in daily use as money in most transactions of purchase. The present value of which we speak, however, depends entirely upon their prospect of a future one. They are always representatives of sums due, and generally acknowledge upon their face that an actual value has already been received for them.

2. *Of Banks.*—Banks of deposits are institutions in which any one can lodge any amount of what passes for money, at its actual and present value at the time. This amount is of course placed to the credit of the owner, and is subject to his order or check, which, as has been seen, is a direction to the bank to pay a sum mentioned therein, to some particular person, or to the owner's self, as the case may be.

There is another kind of bank, which is founded on other and wider principles—one which consists of an association of capitalists, who each subscribe a certain amount of capital in shares that are capable of transfer, which capital is employed in various ways, but generally in the discount of notes and bills of exchange. Discount is the advance of the value of the paper offered to them, after the deduction of the legal interest for the time the paper has yet to run. They likewise perform another office, with the view of enabling them to enlarge their capital, and increase their amount of business: they issue notes, bearing on their faces a promise to pay to the bearer, on demand, the amount of gold or silver specified therein. The security they offer to individuals is the amount of commercial paper they hold, subscribed by individuals in good circumstances. These notes are entitled *bank notes*, and the institutions that issue them, banks of discount and circulation. The banking associations of this country, generally unite all the above-named qualifications, that is, while they receive deposits, they issue notes, and when able, give discounts, a complication of business which is extremely useful to the community, when such institutions are properly managed.

DISTRIBUTION.

OF THE BASIS OF VALUE.

We now come to a second branch of the science of Political Economy, that of Distribution. The various phenomena of Production have already been discussed. Human industry, it has been seen, assisted by capital and certain natural agents and properties, creates utility, which is the basis of value. Value is the object of distribution. We have shown again and again, that products are always the result of aggregate labour, and not of the toil of a single individual: one person rarely completes any thing; on the contrary, production is divided among many, all of whom assist in the formation of a product. One, for instance, is possessed of a farm, a second tills the ground and sows the seed, a third reaps the crop, and so on until the article grown is in the hands of the consumer. Each of them, of course, must be compensated for his labour. But how? With the price paid for the product created by their united efforts which must be justly and proportionably divided between them. The principles which regulate the whole of this transaction fall under the name of *distribution*. It may be asked, what is the valuation of an object. "It is nothing more nor less," says Say, "than the affirmation, that it is in a certain degree of comparative estimation with some other specified object; and any other object possessed of value may serve as the point of comparison. A house, for instance, may be valued in corn or money."

Whenever a thing is valued, the object so used is the fixed *datum*. In the instance just quoted, the house is the *datum*; for it is a definite amount of material put together in a particular way, and on a particular site.

Valuation is vague and arbitrary, when there is no certainty that it will be accepted by others. The nearest way to arrive at the truth of the value of any commodity, is to estimate it at what it is certain to bring in the market, the want or desire for it being always certain to fix its current price. This brings us to the consideration of

SUPPLY AND DEMAND.

Demand is of course the desire for some particular object or article, and is greater or less in proportion to the extent of that desire; while *supply* is the quantity of that article, which can readily be attained at any given time. The principal bound to demand is the inability to give some other product, whether it be money or otherwise, in exchange for it. Demand of course depends upon the number of consumers, and their ability to pay for the article desired.

OF THE SOURCES OF REVENUE.

It has already been shown that products are the offspring of productive means in the command of mankind, such, for instance, as industry, capital, and natural powers and agents. These products when raised by man form his revenue, and enable him to obtain such other things in exchange as are not given gratuitously either by nature or his fellow-man.

The right to the disposition of revenue is a natural consequence of possessing the means of production. Only such things as are the subject of human use are the sources of revenue: whatever are not, form no portion of human wealth, there being no such thing as wealth, except where property is known and certain, and possession acknowledged and beyond dispute.

Perhaps it would be well to suggest that property in human industry, and in what is generally known as capital, which has been before defined, is more holy and less capable of dispute than mere natural powers and agents.

Revenue, with the several sources of production, is a constituent proportion of wealth, yet it would be foolish to assert that the consumption of revenue could render any one poorer, for his productive means (his capital) remains untouched, and that still goes on producing revenue. Should his capital, however, be touched, his revenue would decrease, proportionably with its diminu

tion. Revenue, too, when unconsumed and added to capital, ceases to be revenue; it becomes capital, and its employment as a productive means causes it to become a source of additional revenue. The value of revenue is also large in proportion not to the value, but to the amount of the product arrived at—to the entire total of utility created. The ratio, therefore, of national revenue is determined not by the value of a product, but by its amount; with individual revenue the case is different.

Whenever any thing can be saved in the original cost of production, that saving is an increase of revenue to an equal extent, a less amount of capital being employed to furnish the same product. The saving, too, of course, becomes an additional means of production.

OF THE REAL AND RELATIVE VARIATION OF PRICE.

Price is exactly the amount of money any thing may be worth, and current price what it is certain to obtain at any particular place; the desire of obtaining any object varying in relation to the quantity obtainable, according to its locality.

Price obtained on the sale of any thing represents all other commodities procurable with the same amount. The price of a bushel of wheat, for instance, is 75 cents; it is therefore exchangeable for that amount of silver, or for such other products as that sum may procure. Price is of two kinds, buying and selling price; the former, where a certain sum is given to obtain possession of a product; the latter, where the same amount is obtained for the relinquishment of such possession.

The cost of producing an object is always its price; and its production, as well as its subsequent exchange for others, resolve themselves into a barter of one product for another, which barter is conducted upon a comparison of their respective current prices. One important particular, however, must not be passed by.

Supposing an ell of broadcloth has cost eight dollars in productive agency, it certainly will have cost the same amount in manufacture; if three-fourths, however, of that productive agency can be made to produce it, the same amount of broadcloth will cost the producer only six dollars, so that, while the current price of the productive agency remains the same, the actual cost of production will have varied in the ratio of the difference between six and eight dollars.

It is otherwise with regard to the variation of price of products already in existence, one to the other, without reference to their respective cost of production. For instance, when the wine of the last vintage, which but a short time previous sold at 10*l.* the tun, brings on sale only 8*l.*, money as well as other productions are dearer to the wine-seller. The reason is plain: the productive power which raised the wine receives less return than it otherwise would have done had the price remained as at first. It may be taken, therefore, as a general principle, that in the course of a *real* variation, such as the first example quoted, the wealth of the people at large is increased, while in the latter example, that of the wine-seller, it remains fixed and stationary.

Wherever a saving occurs in the cost of production, it implies the obtaining either of a larger product by the exertion of the same agency, or of an equal product by means of less agency, which are one and the same, while, at the same time, it is always followed by an increase of the product itself. It has been thought by some, but erroneously, that an increase of production is not always succeeded by an equal increase of demand, and that the price current of the product must consequently fall below the cost of producing it. This is a mistake: the fall of price always increases the quantity of consumers, and the increase of demand invariably outruns the increasing powers of an improved production operating on the same productive agency. Every enlargement therefore of productive means creates a demand for more of those means. The invention of the art of printing, and the increased demand for books now over that in the days of Faust, furnishes a striking example of the operation of this principle.

On the other hand, as a real advance of price always arises from a deficiency in the product raised by equal productive means, so it is invariably attended by a lessening of the aggregate of national wealth. The reason is this: the increase of price on each portion does not counterbalance the reduction that is sure to occur in the total quantity of the product raised, while the object of consumption becomes dearer to the consumer, who suffers a corresponding impoverishment.

Suppose a murrain or bad management causes a scarcity of sheep, the price of these animals will necessarily rise, but not in the same proportion with the reduction of the supply, for the demand decreases in proportion as the sheep grow dearer.

It may therefore be insisted on that every real reduction of price, instead of reducing it, augments the nominal value of produce raised, and that a real increase of price invariably reduces the amount of national wealth, while at the same time it lessens the quantity of human enjoyment.

The difference between a real and relative variation of price is a considerable one. A real variation is an increase or decrease of price, consequent upon some alteration in the cost of production; a relative, a change in price consequent on an alteration of the ratio of value of one article of produce to other articles. The first is beneficial to the consumer while it does no injury to the seller, and the converse; but in the other what is gained by the seller is lost by the consumer, and the converse.

Wherever sales of products occur between one country and another, the nation which vends the product that has advanced relatively, gains exactly the amount of the advance, while the purchaser loses in the same ratio. The rise of price adds nothing to the general wealth of the world, which only increases with the appearance of something new and useful, that may become the object of demand.

OF NOMINAL VARIATIONS OF PRICE, AND THE VALUE OF BULLION AND COIN.

In treating of the rise and fall of the price of commodities, although value has been expressed in money, no notice has been taken of the value of money itself; which, speaking truly, plays no part either in the real or the relative variation of the price of commodities. One product is ultimately bought with another, although paid for at first in money. When the price of any product is doubled, it can only be obtained by giving twice the quantity of every other commodity in exchange. It is no matter whether the exchange be made directly, or through the intermediate means of money. Money is capable of undergoing a real variation in the cost of its production, as well as a relative one in comparison with other products.

The discovery of the South American mines caused a considerable fall in the value of silver, at least three-fourths, while on the other hand price remained stationary.

The peculiar and inherent value of bullion or money has its rise in the various uses to which they are applicable. The degree of value is greater or less as they are more or less employed, or more or less abundant.

The major portion of the coin of the world may be said to be in constant circulation. In this respect it is wholly different from other commodities which only continue in circulation during the time they remain in the hands of the dealers, retiring from it as soon as they reach those of the consumer. Money, ever during the

time it is employed as capital, is not an object of consumption, but barter, every act of purchase being an offer of money in exchange, and an increase of its circulation.

Gold and silver, when employed in the purposes of manufactures, is only in circulation while it remains in the hands of the dealer, waiting for a customer. It retures from it when it reaches the hands of the consumer.

Nothing but a large influx of silver from some new source can eventually affect its value. Were it, however, like food or raiment, an object of necessity, the case would be different; for the constant impulse of humanity to the increase of their species to a level with their means of life, would make the demand coexist with the supply. The peculiar use of silver in the character of money depends upon the number of movable and stationary objects that may be intended to be circulated. Coin, therefore, would be more abundantly required in rich than in poor nations, but that the superior quickness of its circulation in wealthy communities makes a smaller quantity requisite in proportion to the whole amount of commercial transactions; while in a state of national wealth, credit is frequently used as a substitute for coin. By the latter expedient in its various shapes, as well as the use of convertible paper, the use of metal money becomes proportionably less. It may be asserted as a safe principle, that the more wealthy a nation is, the less amount of coin she uses when compared with other nations.

If the nations of the earth increase in wealth in the next, as they have in the last five centuries, their want of the precious metals will increase in proportion; but if the supply of gold and silver transcends the increase of the aggregate wealth of the world, it will fall in value in respect to all other commodities. Metal money may thus one day become as cumbrous as the tin coin of Lycurgus, but the use of gold and silver will become amplified in a proportionate degree.

OF THE DISTRIBUTION OF REVENUE AMONG SOCIETY.

The various causes which determine what is entitled the value of things, apply to all matters that exist, whether perishable or no; and among the rest is the productive service of industry, capital, and land, when in a state of productiveness. Those who have at their disposal any or all of these sources of production, are *vendors* of productive agency; those who consume the product, are *purchasers*. The relative value of the product rises with the demand, and in the inverse ratio with the supply.

Those who employ industry wholesale, are brokers between the vendors and the purchasers, who engage a proportionable quantity of productive agency to the demand for the product, which demand is greater or less in proportion to the product's utility. Farmers, manufacturers, and merchants are constantly comparing the prices which the consumers can and will give for a particular product, with the necessary cost of producing it. If the comparison is such as determines either one to produce it, he is the means by which a demand is made for all the productive agency applicable to the matter, and so becomes one of the bases of the value of that agency.

On the opposite hand all the agents of production, whether animate or otherwise, land, capital, and labour, are supplied in larger or smaller proportions, in accordance with various motives to be noticed hereafter, thus forming the other several bases of the value at which their agency is rated.

Every product, as has been seen, repays, when completed, by its superior value, the total amount of the agency employed in its production. A great part of this agency may have been paid for long before the entire completion of the work, advanced, of course, by some one, while other parts, however, may have been paid for at its completion; nevertheless the whole is ultimately paid for out of the value of the product. The total value of almost every product is shared or *distributed* among the various hands employed in its production long before it is finished. Each successive producer makes the advance to his predecessor of the value of the product at the time, with the value of the labour expended in advancing it to that stage. The consumer finally pays for all.

All the revenues of a community are distributed in a like manner.

That portion of the value produced, which accrues in this way to the land proprietor, is entitled the profit of lands. This is sometimes transferred to another, the farmer, in the consideration of a fixed rent. Whatever portion is assigned to the capitalist, however minute may be his advance, or for how short a space of time, is called the profit of capital. This capital is sometimes loaned, and the profit given up in consideration of a prescribed interest. That portion which is given to the mechanic or labourer, is entitled the profit of labour; which is again sometimes abandoned in consideration of certain wages. Each class consequently receives its share of whatever value is produced, and this share is its *revenue*. It is in this way that the entire amount of the value of products is shared among the various members composing a community. That only is profit to the producer which is made after all the necessary charges, expended in producing his particular products, are paid; and is termed his net produce. His gross produce is the total amount of his production without deducting his net profit.

The total amount of profit obtained by an individual from his land, capital, and industry, in the year, is his *annual revenue*. The total amount of all the profits of the individuals of a nation in the same space of time, is its *national revenue*. Its sum is the gross value of the amount of the national product, less what it exports; for the relation of nation to nation is the same as that of individual to individual.

The money into which revenue is converted must never be confounded with the revenue itself; the latter is the actual product of the producer's creation, which, by barter, may be converted into any shape the producer pleases, whether it be products of a similar or dissimilar character, or otherwise.

The same rules that apply to material, obtain with immaterial products. The advice of the lawyer and physician, for example, are the products of their respective talents, which are their productive agency. Whoever has occasion to use either, gives in exchange for it a commercial product converted into money. Each of these in turn consumes his revenue in the way best adapted to his peculiar desires.

OF THOSE KINDS OF PRODUCTION THAT YIELD THE BEST RECOMPENSE TO PRODUCTIVE AGENCY.

The profits of productive agency differ with the variety of the branches in which it is engaged; in some they are excessively large, while in others they are miserably small. Productive agents, to be sure, always strive to direct their agency to those employments which produce the largest amount of profit, and thus, by competition, decrease price in the same ratio as it is increased by demand. The efforts of competition do not always insure a proportionate remuneration, for it is impossible that they should ever properly proportion the supply to the demand.

As a general rule, the largest profits are made on such products as are most common and least able to be dispensed with, and not on those costlier ones which may be considered rather as objects of luxury than any thing else. The reason is plain; the demand for indispensable articles is created by actual necessity, and increases with every addition to production. Nothing tends so much to create a large population, as to supply it with plentiful means of subsistence. On the other hand, the demand

for luxuries depends almost entirely on contingencies. In the first place, they are not indispensable, but objects of secondary want, and the desire to obtain them is limited to the few who can indulge in them. The productive agency employed in the manufacture of superfluities is always worse paid than that employed in any other form. In large cities, the case is somewhat different; for where fashion commands, fools are always found to obey. There, objects of ornament, whether in dress, furniture, or otherwise, command a readier sale, and of course recompense the agency employed in their production, by more considerable profits. Nevertheless, the most fashionable tradesmen are most frequently found insolvent.

Commodities of common utility, on the other hand, lie within every one's reach; they are equally attainable by both rich and poor. The articles composing human food, for instance, as bread and meat, are indispensable, and, despite the briskness of the competition, yield the most certain and the largest profits. Bakers and butchers, sooner or later, retire from business with a competency; indeed, they are among the wealthiest of our citizens. The demand for such things, besides, is always steady. The farmer is never very long in disposing of his wheat or potatoes, while the hot-house cultivator finds it difficult to get rid of his forced pine-apples. There is a greater demand for the cotton goods of Lowell than for the laces of France, or the superb shawls of Cashmere.

OF THE REVENUE OF INDUSTRY.

1. *Of the general profits of industry.*—The motives which increase the demand for products have been examined before. There is little necessity therefore of enlarging on them.

When the demand for any product is lively, the productive agency which creates that urgency is also in demand, a consequence which increases its ratio of value. Industry, capital, and landed property, invariably yield the largest proportion of profit when the demand for products is brisk, affluence expanded, profits most widely circulated, and production most prolific and vigorous.

When the demand for some products increases over that for others, what is most sought for affords the greatest remuneration to the productive agency employed in its completion.

Examining the subject rather more in detail, we shall ask in what cases the profits of industry bear a greater or less proportion to those of capital and land, and the converse; and why certain methods of employing all these are more profitable than others.

Commencing with the first, and comparing the relative profits of industry with those of land, we find that they bear the greatest ratio where profusion of capital creates a demand for a large amount of industrious agency. Such is the case in a great proportion of the United States, because population, and, of course, the human agents who produce, bear but a small proportion to the extent of land and the constantly increasing amount of capital.

The profits of the different branches of industrial agency, taken one with the other, increase or diminish in proportion, first, to the extent of danger, trouble, or fatigue, which attend them, or to the extent of pleasure which they may afford; next, to the continuance or irregularity of the particular occupation; and, lastly, to the extent of skill or talent that they may require.

Each of these circumstances varies the natural ratio of profit, while it tends to diminish the *quantum* of labour in circulation in each branch.

Some professions receive a large proportion of their revenue in honour, as authorship of all kinds. Dancers and opera-singers, on the other hand, are better paid, because they are held in less estimation. The one balances the other. Every temporary occupation ought to receive a high recompense, for the labourer should be paid as well for the time occupied in his task as for that in which he is idle.

Employments of time and talent, requiring, as they do, a liberal education, receive more reward than those which demand a less one, education being capital which should yield interest exclusive of the ordinary profits of industry.

2. *Of the profits of the man of science.*—The man of science, labouring as he does for the welfare of mankind, receives but a minimum proportion of the profits of his industry, no matter how beneficial it may be. The reason is plain. He throws into circulation in a moment an immense stock of his product, which is one that suffers no deterioration by use; consequently it is unnecessary to resort to him for a fresh supply. No matter how much time or how much labour has been expended and exerted in the cause, the result must be the same. The information that may have taken years to accumulate, occupies but a few pages, and is instantly circulated in the greatest abundance. It is for this reason that enlightened governments, by special favours and flattering distinctions, indemnify the man of science for his labours in the cause of mankind.

These remarks, however, apply only to the revenue a man of science obtains directly from his calling. There is nothing to prevent him from being a land-holder, capitalist, or merchant, from either of which situations he may derive revenue.

3. *Of the profits of the master-agent in industry.*—Before we proceed in this section, we must repeat that the occupation of master-agent, or adventurer, as he has been distinctively styled, is one which is comprised in the second class of operations specified as necessary for the setting in motion all classes of industry, whether agricultural, manufacturing, or commercial. The farmer, or cultivator on his own account, the master-manufacturer, and the merchant, are all adventurers in their respective departments of industry. We are now to consider the nature of their profits.

The price of their labour is regulated by the ratio of the supply, or quantity of that labour in the market, to the demand for it. Two principal causes operate to limit the supply, both of which consequently assist this superior kind of labour to maintain a high price.

In the first place, the agent must possess the necessary funds. He need not be rich, for he may work on borrowed capital, but he must be solvent, possess the reputation of intelligence, prudence, probity, and regularity, and be able to procure that which he himself does not possess.

In the second place, this particular class of labour requires an association of moral qualities that do not often run together—judgment, perseverance, a knowledge of the world, and of business.

All branches of industry, however, do not require the same amount of capacity and knowledge. The farmer is not expected to possess the same business qualifications as the merchant; on the contrary, he may do well enough with the knowledge of two or three sorts of cultivation. The merchant, however, must be well versed in the nature and quality of his merchandise. He must have some knowledge of the extent of the demand, and of the markets whither his goods are sent for sale. He must also be constantly informed of the price current of the different parts of the world, be able to form a proper estimate of these prices, to do which he must be acquainted with the several national currencies and their relative value, or, to speak more technically, their rate of exchange; he must know the means of transportation, its risk and expense, and the laws and customs of the people he does business with, beside other matters of knowledge too numerous to mention here. It is not surprising therefore, but rather a necessary consequence, that the merchant who possesses all these requi-

sites, should be better paid than the farmer who possesses only two or three.

4. *Of the profits of the operative labourer.*—Simple labour may be exercised by any one who is possessed of life and health: bare existence, therefore, is all that is requisite to maintain a supply of this kind of industry; consequently its wages in any country rarely rise above what is necessary to the operative's subsistence. In the United States, however, it is better paid. The supply of operative labour nearly always maintains an equality with the demand: it sometimes, however, transcends it, for the difficulty lies not in the labourer acquiring existence but subsistence. Necessary subsistence may be taken as the standard of the wages of common raw labour, but the standard itself is extremely fluctuating, comfort having immense influence in the scale of human wants. What is necessary subsistence, then, depends partly upon the habits of the nation to which the workman may belong. His ordinary wages are generally low, and the product of his labour cheap, in proportion as the value he consumes is small or large. If his condition be improved and his wages raised, either his product becomes more expensive to the consumer, or the share of his fellow producers becomes less.

The wages of the labourer are always a matter of adjustment between the constantly conflicting interests of employer and employed, the former endeavouring to give as little, and the latter to get as much as possible. The advantage, however, lies in the hands of the employer, whose wants are fewer, although both are actually necessary to each other.

OF THE REVENUE OF CAPITAL.

Capital, when employed in production, renders a service which creates a further demand for other capital, to be employed in a similar manner, and enables the holders of it to charge more or less for its use.

It is no matter whether the capitalist employs his means himself, or loans it to another for that purpose; it still yields a profit, which is entitled the profit of capital, distinct as distinct can be from that of the industry using it. Where the capitalist employs his capital himself, the profit so gained is the *revenue* of his capital, which is added to that of his personal talent, industry, &c., and frequently confounded with it. Where he loans it to another, the revenue of his capital is exactly the sum paid for its use.

1. *Of loans at interest.*—The interest of capital lent, erroneously called the interest of money, is nothing more than rent for its use and enjoyment.

In ordinary cases the loan of capital is no longer what it once was, a resource in the hour of distress, but an agent and instrument which is beneficial both to society and individuals.

In common cases of exchange the transaction is finished when the exchange is completed, but in the matter of a loan, the lender always calculates the risk of recovering the whole, or, perhaps, only a portion of his capital. This risk is usually practically estimated and indemnified by the addition of interest.

The ratio of the premium of insurance, or, in other words, of the addition of interest, depends entirely on the degree of security presented by the borrower. This security consists in three circumstances—the safety of the mode of employment, the personal ability and character of the borrower, and the good character of the government he happens to reside in. Hazardous purposes, to which loans are sometimes applied, always enhance the premium of insurance.

Among other circumstances incident to the nature of the employment of money, that influence in a great degree the rate of interest, is the duration of the loan, the lender always being willing to loan for a less return when he can withdraw his funds either at pleasure, or what is nearly the same thing, in a very short period of time.

It may be taken as a general principle that the more abundant is disposable capital, the lower will the interest of borrowed fall; and that capital in search of employment, and industry in search of capital, to be fully satisfied, must have an entire liberty of dealing allowed in all matters relating to loans at interest. Any interference of government on the subject, in the shape of laws regulating the rate of interest, are always of little or no avail, for emergency compels their evasion. Interest nevertheless, in cases where there is no previous agreement about it, should be regulated by law as in the case of a legal recovery of a sum with interest, but no further. The word usury should become an exploded term.

2. *Of the profits of capital.*—In the first place, in investigating the causes of the profit derivable from the employment of capital, whether by a borrower or the proprietor personally, it is necessary to divide it from the profit of industry that turns it to account. This is always a matter of difficulty, and the best writers have become confused upon the subject.

Perhaps an approximation may be made towards the exact appreciation of the portion of the aggregate profit which pertains to capital and that which pertains to industry employing it, respectively, by comparing the mean ratio of total profit with the mean ratio of the difference of profit in the same line of business, a course which will afford a sure index of the difference of the skill and labour engaged. Suppose two firms, printers for example, to work each on a capital of $50,000, and to make, on the average, a yearly profit, the one of $12,000, the other of only $3000, a difference of $9000, fairly referable to the different extent of skill and labour, the mean of which is $1500; this may be considered as the gain of industry, which, deducted from $7500, the mean profit of the business, will leave $3000, the profit of the capital embarked in it.

Without any index to the precise line between the profits of capital, and those of industry employing it, we may take it as a rule that the first will always proportion themselves to the risk of total or partial loss, and to the duration of the employment. The profit of capital is always high in proportion to the hazard of the adventure, and the length of time it occupies. The profits also of a new employment are greater than those of an old; for in the one, competition is deterred by the uncertainty of success; in the other, allowed by its security of employment. In a word, in this, as in every thing else, the ratio is determined by the relative demand and supply for each manner of employment respectively.

3. *Of the employment of capital in ways most beneficial to society.*—The best employment of capital by the capitalist, says Saye, "is that which, with an equal division of risk, produces the largest proportion of profit." With the community at large, however, the case may be different, for what may be beneficial to the one may be the converse to the other. Capital has a particular faculty, that, besides producing a revenue distinctly its own, it is a means by which land and labour may create an additional revenue.

Capital, when embarked in domestic agriculture, is productive of most good to the interests of a nation, for it enhances the productive power of the land as well as of the labour of a country. It increases the profits of labour as well as the profit of real property.

For like reasons capital cannot be better employed than in aiding and strengthening the productive capabilities of nature, as in the creation of well-contrived and useful machinery for that purpose.

After this comes the employment of capital in manufacture and internal commerce, for the profits of the industry they set in motion are earned at home.

All these distinctions, however, are very subtle, and

may be questioned whether they really have any existence—whether, indeed, there can be any dividing line between the different channels into which capital may be directed. We think not.

OF THE REVENUE OF LAND.

1. *Of the profits of landed property.*—Land has the power of transforming and adapting to human use an immense variety of substances, which, without the assistance of mankind, would be of little or no service to them. Its agency in the production of various commodities may be called the productive service of land. Thence it is that the profit of the owner originates.

He may also derive a benefit from substances taken from its entrails, as in mining stone, coal, the precious metals, &c.

Land, as has been seen before, is not the only natural agent possessing the property of production, for the wind may turn our mill, or drive our vessels across the ocean, while water may propel our machinery, but it is the only one which man can claim an exclusive proprietorship of. If it were otherwise, capital and industry would never be employed on it, for no one would be foolish enough to make an outlay where he could reap no benefit.

Let us now look into the profit of land in the abstract, and the origination of that profit, without asking who may be the cultivator, whether the proprietor himself or a tenant under him.

The productive power of soil is possessed of no value unless its products are objects of desire, as in lands lying in an uninhabited district. As soon, however, as a settlement is made in the neighbourhood, those products, finding a market, become valuable, and cultivation immediately ensues. If any circumstance, however, should occur to increase the demand beyond this point, then the value of the products will exceed the ordinary rate of interest on the capital invested, when the actual cultivator, not himself the owner, is enabled to pay a rent to the proprietor after having first received the interest on his own advances and the profits of his own industry. From these products of the soil thus raised in value by the demand, and these only, can accrue to the owner thereof that profit which has been called the profit of land.

The rent of land nearly always depends on the situation of the land itself. Where it is distant from a market, the rent is low; where near, proportionably high. It may be asked, what is the difference between the profit and the rent of land? It consists in this: profit is great or small, according to the quality of the product: rent, according to the quantity of the purchase-money or price. An acre of land, producing a profit of $5 only, will bring as high a rent as another yielding a profit of $250, if fifty times more has been paid for the one than the other.

Landed property of all kinds nearly always yields a less rate of interest than money invested in other ways. The reason why so much capital is annually invested in it, is because of the superior stability of the investment, besides the accession of dignity which always appertains to one who is known as a landed proprietor.

The only thing which actually varies the amount of the productive agency of land in circulation, is the amelioration of the soil.

2. *Of rent.*—A farmer, leasing land, pays to the proprietor whatever profit accrues from its productive means, reserving to himself the wages of his own industry and the profit on the capital he embarks in the business. This profit, thus paid, is called rent.

Rent is generally placed at the highest rate of the profit of land, and for this reason:

Agriculture requires a smaller capital than almost any other class of industry; of course a greater number of persons are ready to embark in it. This creates a greater competition of bidders for the land on lease. Besides, the supply of land fit for cultivation is limited in all countries. Land owners are thus enabled to enforce a kind of monopoly against the cultivator. The number of acres to be rented in each section of country cannot be increased, but the number of persons desirous of renting them may be infinite. In such a case the bargain between the proprietor and tenant must be greatly in favour of the former. In case any portion of the soil should yield the latter more than the interest of his capital, and the wages of his industry, a higher bidder would soon offer himself.

Whenever a proprietor of land expends capital in the improvement of land, in draining, irrigation, sowing, building, &c., the rent then includes, in addition to the profit of the land, the interest of the capital thus expended. The farmer, however, may make these improvements himself, but he can only receive an interest on his outlay during the continuance of his lease, after which they belong to the landlord. The farmer, therefore, should only engage in such improvements as would be sure to repay him for them in that space of time. It is in this way that long leases operate to increase the products of the land. The effect, however, will always be found greater when the proprietor farms his land himself, for he is rarely liable to lose the benefit of his advances; on the contrary, every proper improvement yields him a permanent profit, and the original outlay is amply repaid when the land is ultimately disposed of.

OF THE EFFECT OF REVENUE DERIVED BY ONE NATION FROM ANOTHER.

One nation can never deprive another of the revenues of its industry. A French tailor establishing himself in the United States, makes a profit there in which his mother country has no participation. Should he, however, after the lapse of years, and the accumulation of a fortune, return to France, he injures America in the same proportion that an American would, who might emigrate with a similar amount of capital.

A nation, receiving a stray citizen back into its bosom, acquires what may be considered a real treasure; for it obtains with him a considerable accession to the profits of its national toil, and an increase of capital as well as an accession to its population.

Where capital is loaned by one country to another, the effect on their national wealth is exactly the same with that arising from the loan of money from one person to another. If America borrows from England, and devotes the money so obtained to a productive purpose, she gains the profits, whatever they may be, arising from the use of the capital so derived, in the same way that a manufacturer or merchant borrows for his own use and gains a profit after paying the interest of his loan.

When one state, however, borrows from another for the mere purpose of expenditure, and not for the purpose of production, the capital so obtained yields no return, and the national revenue is compelled to disburse a yearly interest to the foreign creditor. In such a case it is always better to borrow from a stranger than from a nation's own citizen, because the amount of the loan is not withdrawn from the national productive capital. In the one case they would only be compelled to disburse the yearly interest: but in the other, having lent the capital, they would be compelled to pay the interest too, at the same time being *minus* the benefit which their industry and land might have derived from its employment and agency.

Whenever any portion of the landed property of a country belongs to a foreigner, the revenue arising from it is an item of foreign and not of national revenue. The foreigner, however, could not have obtained it without having given its equivalent in money, which capital

is an acquisition in any case, but more so if the country is possessed of an abundance of land without a sufficiency of capital to employ it in production. There is nothing to be apprehended from the purchase of land by foreigners.

The mere form in which one nation receives revenue from another is a matter of no consequence. It may be sent in specie, bullion, or commodities. It is, however, necessary that it should have the choice of the mode of receipt, for whatever suits it will be the best for both countries. The exportation of specie for this purpose is sometimes but always erroneously checked. Nothing can be more absurd than to see a government prohibiting the export of national specie as a means of checking the emigration of wealth.

OF THE MODE IN WHICH QUANTITY OF PRODUCTS AFFECTS POPULATION.

1. *Of population as connected with political economy.*—Nature in her treatment of all organic objects seems to neglect the individual and afford protection to the species. The most powerful means which she employs for their perpetuation is the increase of germs in such immence profusion, that, notwithstanding the myriad things which occur to prevent their proper development, or to destroy them before they reach maturity, there is still sufficient left for subsistence. The same faculty of infinite increase obtains with man as with other organic bodies.

Animal existence depends only on the gratification of one want—food and sustenance—but man is enabled by the faculty of communication with his kind, to exchange one commodity for another. The owner or producer of an article of $10 value, may deem himself possessed of as much human food as he may be able to procure for that sum; for it is an established principle that when any exchange occurs, what is given on one side is of equal value to that given on the other, and the one is procurable for the other.

Trade, it has been seen, adapts products to the nature of the demand. Those for which the most desire is felt, are most in request, and the wants of every one are more or less satisfied in proportion to his ability to obtain them, which ability depends, in plain terms, on his revenue. Thus, in the end, families and nations, which are only organizations of families, subsist wholly on their own products, while the amount of the product in each instance necessarily limits the numbers of those who subsist on it.

Notwithstanding the forethought of man and the various restraints imposed on him, population always increases with the means of subsistence, indeed generally goes beyond that point. The consequence is, that even in the most thriving countries, a portion of the population perishes from not having at command all the necessaries of life, which, to be sure, are not denied; yet, nevertheless, are not afforded. It may be laid down as an established fact, that the population of a state is always proportionate to the sum of its productions, and that nothing tends so much to permanently increase population as the encouragement and advancement of production.

It will no doubt be asked by some, if the population of a country keeps pace with its means of subsistence, what will become of that population in times of scarcity and famine?

The result is unhappily too plain: despite every precaution, in times of great scarcity, some portion of the lower class must perish.

In fine, national population is uniformly proportionate to the quantity of national production, varying locally, however, within the limits of each state, according to the favourable or unfavourable operation of local circumstances.

2. *Of the influence of the quality of a national production or the local distribution of the population.*—For the cultivation of the earth, population should extend over its surface; for the growth of industry and commerce, it is also desirable to associate together in those places where there can be the greatest subdivision of labour. The dyer by this means is brought near the cloth manufacturer, the druggist near him, while the owner of a vessel employed in carrying drugs will naturally get as near the latter as possible. This association, when extended, in time naturally forms a city.

A city is always the focus of every kind of luxury, pleasure and amusement, and those who live without labour, on the interest of capital or the rent of land, naturally flock where they can find all these requisites.

There are, however, many country residents employed in manufacturing industry, besides others who make it their abode in preference. Local conveniences, running water, the neighbourhood of an extensive forest, or mines, will draw machinery and labourers from the precincts of a city. There are many kinds of work, too, which can only be performed in the vicinity of consumers, as shoemaking and tailoring. The number of these, however, is trifling, compared to the amount of industry exercised in the same branches in populous cities.

A prosperous country is capable of supporting in its cities a population equal to, if not greater than that of the country; but its industry must be conducted with skill, and its agriculture with intelligence, and without waste. But towns, when they create a product for foreign consumption, are enabled to draw provisions from abroad in return, and thus may sustain a much larger proportion of inhabitants than the country.

Where pasture land is extensively cultivated, as in Flanders and Holland, a greater portion of the inhabitants can devote themselves to other kinds of industry than they possibly can in corn countries, for pasture-land requires much less labour.

After all, nothing tends so much to advance the agricultural interests of a country as the growth of cities. Stud a country with cities, towns, and villages, and you will soon find it reaching its highest point of agricultural production. The towns then find subsistence on the agricultural products of the district, while the farmers are enriched by the productive industry of the town.

CONSUMPTION.

OF THE VARIOUS KINDS OF CONSUMPTION OF WEALTH

We have already touched, somewhat slightly to be sure, on the subject of consumption, but in the present, the last portion of our tract, we shall consider it separately. We have shown over and over again that the production of utility cannot take place without the consumption of the same, and that as production means the creation of utility, so consumption signifies its destruction. When the utility of any thing is once destroyed, the article itself becomes valueless, and, ceasing to remain an object of desire, is no longer an item of wealth. "Consumption, then," says Saye, "being the destruction of value, is commensurate, not with the bulk, the weight, or the number of the products consumed, but with their value."

Products of all kinds are not only capable of consumption, but liable to it, for the value which can be added may be afterwards subtracted from the object. When it has been added by industry, it may be subtracted by use, or in a hundred other ways. But it can only be destroyed once; when an article is once consumed, it cannot be consumed again. Consumption is either *rapid* or *gradual*, rapid, where a product is destroyed at once, or gradual, where the time of its destruction is of longer duration. A mansion or a vessel is as consumable as a piece of meat or a coat. Consumption, too, may only be *partial*. As, for instance, when an article is sold by its possessor, when a residue of value is left, for which

an equivalent is received at the time of the sale. It may also be *voluntary*, or *accidental*, as when goods are thrown overboard to lighten a ship in a storm in the first case, or when the ship itself with its cargo is wrecked, in the second. The latter case, however, is also one of involuntary consumption.

Value may be consumed either in the act of its production, or at some subsequent time. Time and labour are also capable of consumption, for both, when applicable to the creation of utility, are objects of value which, once consumed, can never be consumed again.

Whatever is incapable of being divested of value can never be consumed,—as landed property, for example. Its annual product, however, may, as may improvements expended on the estate itself. So, likewise, with any faculty of industry.

Products are created for the purpose of consumption, and are sooner or later consumed. Whenever, however, this is delayed after they have reached absolute maturity, their value becomes inert and neutralized for the time. The reason is plain. Value of every kind is reproductive and capable of continuing to yield a profit to its possessor; its non-use, therefore, is the loss of whatever might have been made by it, had it been properly employed.

All products being destined for consumption in the most speedy manner, it may be asked if an accumulation of capital, or rather of values produced, can ever take place? It can. Value may be accumulated, without its being always vested in the same particular product, but it must be perpetuated in some product or other, values, when employed as capital, being always continued by reproduction. All the products of which capital consists, as has been seen, are as much capable of consumption as other products, but just as soon as their value is destroyed by consumption, it reappears in another and generally an improved form. Manufactories, too, cannot be kept up without a considerable consumption of articles of food, as well as of the raw material employed in the manufacture itself. Nevertheless, however, while one value is undergoing consumption in these forms, another makes its appearance in the object manufactured. The various items that formed the capital are gone, but the capital, itself, still exists in another shape, like the former, liable either to consumption or reproduction.

The yearly consumption of any human being is the aggregate amount of all the values consumed by him in that space of time, understood, of course, as the gross and not as the net amount.

All the commodities which a nation imports must be considered as a part of its yearly product; all its exports as a part of its annual consumption. The French trade consumes all the value of the silk it sends to America, and produces, by way of balance, what cotton it receives in return.

There is a wide distinction between the retail annual consumption of a nation, or a person, and the aggregate consumption of capital. Capital may be consumed either wholly or partially again and again in that time. When a tailor buys cloth and manufactures it into garments, so much capital is consumed and reproduced. Suppose he expends $100 in the purchase of material and repeats the operation twenty times in a year, there will have been a yearly consumption of $2000 on a capital of only $100. On the other side, the implements with which he works may be only partially consumed, and their consumption may not amount to more than one-twentieth, or the one-fortieth of his capital.

Everywhere the desire of the consumer determines the character and quality of the article produced. Whatever is most desired is most in demand, and yields the largest proportion of profit to the producer, and the converse.

Total annual consumption may be either public or private; the former when it is effected by the public, or in its service; the latter when it is effected by individuals or families. Either class may be productive, or the contrary.

The members of every community are consumers—indeed, they could not be otherwise, for no one can exist without some want which must be gratified. On the other hand, all who do not subsist on mere charity contribute in some way to production either by their capital, their industry, or their estates, who thus may be said to be both consumers and producers. The great bulk of consumption takes place among the poorer portion of society, whose majority more than counterbalances the minuteness of their individual shares.

Wealthy and industrious nations consume more than poor ones, because they produce more, generally re-consuming their capital frequently in the year. Besides, they consume unproductively the greater proportion of their revenue, no matter how it may be derived.

OF THE EFFECT OF CONSUMPTION GENERALLY.

The invariable effect of consumption is the destruction of value, and consequently of wealth, for a product consumed is a value lost to the world for ever. The after consequences, however, depend on the character of the consumption.

If the consumption be productive, a creation of new value, equal, inferior, or superior to that consumed, arises; if the converse, the general result is the gratification of some want, but the production of no value whatever.

Consumption, therefore, may be regarded as an exchange of value, either for some fresh value, generally of a superior character to that destroyed, or for the gratification of some personal desire. The latter branch of consumption, it may be remarked, requires no talent in the consumer, but the former requires a combination of labour and skill—what we have heretofore spoken of as industry.

OF THE EFFECT OF PRODUCTIVE CONSUMPTION.

Productive consumption has been defined. The value employed in its operation is called *capital*. The merchant, manufacturer, and cultivator purchase the raw material (which denomination comprises all products bought with a view to the creation of additional value), as well as productive agency, which they consume in the creation of some new utility. The immediate effect of this is entirely similar to that of unproductive consumption, that is, it creates a demand for the objects which they consume, operating upon their price and production, and causing a destruction of value. The ultimate effect, however, is different; no immediate satisfaction of any human want arises, no resulting gratification, excepting the result which accrues to the adventurer from the production of a fresh product, the value of which replaces that of the products consumed, and which generally affords him a profit in the bargain.

A saving of productive agency, whether it consist of industry, land, or capital, is equally real and effectual with the saving of a corresponding amount of raw material, an effect practicable in two ways; either by making the same productive means yield a greater agency, or by obtaining the same result from a smaller amount of means.

Such savings always operate to the benefit of the community; they reduce the charges of production; and in proportion as the economical process becomes more thoroughly known and generally practised, the competition between producers brings the price of the product gradually to a level with the charges of production.

OF THE GENERAL EFFECT OF UNPRODUCTIVE CONSUMPTION.

Unproductive consumption we have before defined to be such a one as is effected simply for the mere satisfaction of some want, or for the sake of enjoying some pleas-

ing sensation; and it has no ulterior effect other than the satisfaction of that want by the destruction of some existing value. It is the simple exchange of a portion of wealth for a corresponding amount of human gratification—nothing else. Wine cannot be drank and distilled into brandy at one and the same time; neither can an object consumed unproductively be a means of establishing a fresh demand, or serve to stimulate productive exertion. It is impossible that it should.

The sole object of our present inquiry, therefore, must be the degree of gratification arising from the act of unproductive consumption itself. The sole point, then, is to balance the loss accruing to the consumer by his consumption against the amount of gratification it produces him. The correctness with which the balance is struck between the two, will determine whether the consumption be judicious or otherwise. The most judicious kinds of consumption are, first, those which conduce to the satisfaction of actual wants, on which depend the health, well-being, and indeed existence of the human race; secondly, such as are the most gradual, and absorb objects of the best quality. The gratification of real wants is more important to mankind than that of artificial ones, for the luxury of comfort affords a more solid pleasure than the luxury of ostentation. Besides, it is less costly. In the second view, nations, as well as men taken individually or collectively, are wisest when they direct their consumption only to those products that are most frequently used, and less liable to wear and tear; as good houses and furniture, for example.

The pleasures which may be considered as among those of the shortest duration are excessively injudicious, even though they may be more pungent while they last.

There are also other kinds of judicious consumption,—the collective consumption of numbers for instance, when a cook dresses a dinner for ten with the same facility that he had formerly dressed one for two, and lastly, on other grounds, such kinds of consumption are judicious which are entirely consistent with moral rectitude, while the contrary are always be attended with public as well as private suffering.

Among the most prominent in the list of injudicious consumption are those things which produce disgust and displeasure instead of the desired gratification. Excesses of all kinds, intemperance, and war when undertaken for the mere purpose of vengeance, may be quoted as examples.

OF INDIVIDUAL CONSUMPTION.

The consumption of individuals is such as is made with the object of satisfying the wants of individuals or families, which wants are principally those of food, raiment, and lodging. They are supplied with these wants out of the respective revenues of each family, no matter how derived. The wealth of an individual or family declines or increases in proportion as its consumption equals its revenue, exceeds it, or falls short of it. The entire amount of individual consumption added to that of the government for public objects, forms the total of national consumption.

OF PUBLIC CONSUMPTION.

1. *Of the nature and effect of Public Consumption.*—The satisfaction of the wants of individuals associated together as a community, and considered as a nation, is the object of national, or public consumption. These wants, when viewed with those of individuals, are of a novel character, and arise from the circumstances accruing from such an association. The United States buys and consumes the service of the President and his various subordinate officers, as well as those of the judges that protect the rights and interest of its several members, and the soldier who defends it from outward injury. How it derives the values with which it purchases these agents will be considered directly.

Government exacts from a tax-payer the payment of a given thing in coin. To meet this demand the tax-payer sells a portion of his products and pays over the proceeds to the tax-collector. Another set of officers are employed in buying with that coin other necessaries for the support of the government and its soldiery. Up to this point no value is consumed, for the proceeds of this money still exist in the shape of stores and supplies. In the end, however, it is consumed, and then the values which have accrued are annihilated. The sum of money itself, however, must not be understood to have been destroyed—that has only passed from one hand to another, and still exists. The same course of conduct obtains with all other kinds of public consumption.

2. *Of the leading objects of National Expenditure.*—These are generally of what have been termed *immaterial* products, or, in other words, products destroyed as soon as created—the services or agency of human beings, or of other objects whether animate or otherwise.

It consumes the personal service of all its officers, whether civil, judicial, or military, and the agency of land and capital.

When government maintains and carries on establishments of productive industry, and they produce more than their expenses, then these institutions furnish a part of the national revenue, and are by no means to be considered as a portion of national charge. Such, however, is rarely the case.

3. *Of the charge of Civil and Judicial Administration.*—The charge of both of these kinds of administration is made up in this country of the specific allowances of magistrates and other officers. In others some allowance is made for the pomp and parade which may be necessary in the execution of their duties. Here, however, every thing is more simple.

Causes entirely of a political nature, as well as the nature and forms of the government, have an influence in apportioning the salaries of its officers as well as its other expenses. The salaries of inferior officers depend not only on their individual importance, but on the general plan of the government, and the services of such men are dear or cheap in proportion not only to what they actually cost, but likewise in proportion as they are well or illy executed. A duty badly performed is highly bought, no matter how little be paid for it; it is also dear when it is superfluous or unnecessary. On the other hand, a public duty may be cheap, however liberally paid, for there is real economy in procuring the best of every thing, even at a higher price. Integrity, too, has its value; like talent, it cannot be obtained without paying for it.

4. *Of Military and Naval charges.*—War is invariably considered as a national curse, although nations are sometimes compelled to engage in it. The soldier at such a time, and indeed at all times, is an unproductive labourer, but in time of war a destructive one. The vast increase of national expenditure during war over the same in time of peace, ought always to deter nations from engaging in combat, and never, except by the express will of the people, which would never be given could they know, as in time they will, their real interests. A national military and naval establishment ought to be reduced to as low an ebb as possible, and such troops retained as can only be made effective after long training and exercise. For the rest, nations ought to rely on their militia and the excellence of their internal polity, for it is next to impossible to conquer a people, unanimous in their attachment to their institutions, as is the case with those of the United States.

5. *Of the charges of Public Instruction.*—It has always been a question in political economy, whether the public were interested in the cultivation of the sciences, and, if so, whether it ought to be at the expense of teaching them?

Every advance of science is succeeded by an increase of social happiness, for man is necessarily dependent on the fixed laws of nature for his subsistence. The better those laws are understood, the better will be his situation. The superiority of enlightened over barbarous nations, in wealth and influence, are sufficient proofs of this fact, and the immense growth of America in so short a space of time may and ought to be attributed in a great degree to the universality of its educational system. The public are undoubtedly interested in the mental cultivation of all its citizens.

6. *Of the charges of Public Benevolent Institutions.*—Individual distress has no title to public relief, except when it is a necessary consequence of the existing institutions of society, and only then when it can be shown that the social system itself affords no means of prevention or cure. Institutions of the kind, however, exist, and are, in fact, kinds of social banks to which every one contributes a portion of his income, that he, himself, may claim a benefit in case of accident or misfortune. Some of these establishments are supported by their power of production, and when their product exceeds their outlay, they are no longer charges upon society. This, however, rarely occurs. The principal benefit they do society is the fact, that they partially relieve the poorer classes from supporting the aged and infirm, and thereby allow population to increase more rapidly than it otherwise would.

7. *Of the charges of Public Works.*—These are generally heavy, consisting of rent, of the interest of the capital employed in their erection, and of the annual charge for their maintenance. Some of these items may be curtailed—rent, for instance, or the charges of maintenance when they are at all productive. Roads and canals are costly examples even under the most judicious management; but the business facilities they afford society fully compensate for their cost. Public works of no real utility are only items of national luxury, and are as indefensible as private prodigality. They never compensate for the loss or the misery they often occasion.

OF THE ACTUAL CONTRIBUTORS TO PUBLIC CONSUMPTION.

Sometimes a portion of the objects of public consumption are furnished by private individuals, but the mass of the resources of a government are drawn directly or indirectly from its people. The government, however, from the sale of public lands, or by leasing them, and thus forming a revenue for its own support, may maintain itself in part; it can never do so entirely. Neither is it right that it should, for it is but fair that the people of a nation should pay for the protection, tranquillity, and safety they enjoy, both in person and property, under a well-balanced administration. The products thus obtained are generally taxes, the nature of which we shall consider hereafter.

OF TAXATION.

Taxation, as has been seen, is the transfer of a portion of the products of a people from their hands to those of the government. Its object is to provide funds. The name of the tax is unimportant, for whether it be called an aid, custom, subsidy, or gift, it is still a burden imposed on the people, considered as individuals, by the government for the purpose of supplying the consumption it may think proper to direct at their expense.

The object of taxation is not the commodity, but its value. Its being paid in coin, goods or personal service is an accidental circumstance more or less advantageous, as the case may be, to the government or the individual. The essential point is the value, which, the moment it leaves the tax-payer, is lost to him, and when it leaves the hands of the government is lost to the world eternally. Taxation serves to deprive the payer either of the gratification he might have in consuming his product, or of preventing its increase, for that part which is lost cannot produce to him again. Taxation, of course, then, tends to lessen, instead of increasing the wealth of a nation, and when pushed to an extreme, impoverishes the individual without enriching a state. History furnishes thousands of examples of this fact.

The best kinds of taxes are, 1. Those which are most moderate in their ratio; 2. Such as are attended with the fewest vexatious circumstances; 3. Such as fall equally on all classes; 4. Such as do the least injury to production; and, 5. Such as are most favourable to the formation of a healthy national morality.

Taxation is either direct or indirect—direct when a specific portion of an individual's revenue is absolutely demanded; or indirect when the demand is made for a specific sum on each act of consumption of any object to which individual revenue may be applied. The latter is the easiest collected and least felt.

Taxation in kind is the specific appropriation of a portion of the gross product to the public service.

OF NATIONAL DEBT.

The distinction between an individual borrower and a government in the same situation is this, that the first seeks for capital for the sake of beneficial employment, and the latter for barren consumption and expenditure. A nation rarely borrows except to satisfy some unexpected demand, or to meet some equally unexpected emergency. The loan in either case may prove effectual or otherwise. At any rate, the whole sum borrowed is so much value lost to the world, while the national revenue continues burdened with the interest yearly accruing on it.

National loans of all kinds are attended with the disadvantage of converting capital, which would otherwise be employed in production, into a means of barren consumption, and in countries where the credit of the government is low, of elevating considerably the interest of capital. Public prosperity can never be advanced by borrowing, except where the capital, so obtained, is employed in safe and certain modes of successful production, which can rarely if ever be the case.

ZOOLOGY.

THE branch of Natural History termed ZOOLOGY, is that which treats of the beings composing the *Animal Kingdom*. The general aspect of these, and the characters by which they may be ordinarily distinguished from plants, are under the observation of every one, and they need not here, therefore, be dwelt upon. It is only when we descend the scale, and arrive at the lowest and simplest of each kingdom, that the characters upon which we have been accustomed to rely successively disappear, and we meet with several tribes which it is very difficult to assign with certainty to either natural division. Thus, there are many animalcules in which no structure characteristic of the Animal Kingdom can be discovered; and yet they exhibit an activity of motion, evidently influenced by the sensations they experience, which shows them to be far removed from plants. It is when the characteristic structure of animals, and the manifestations of sensibility and power of spontaneous movement disappear together, as is the case in the sponge, that the naturalist is the most perplexed in regard to the place he shall assign to such beings; and he can only solve the question, by ascertaining whether the *general resemblance* is the greatest to beings of distinctly *animal* or of distinctly *vegetable* character. By this criterion, the sponge will hereafter be found to deserve a place in the Animal Kingdom.

The differences of structure which are most universally found to separate animals from plants, are those which are connected with the mode in which food is assimilated (or converted into the materials of their own fabric) by the beings of the two kingdoms respectively. Thus, it may be constantly noticed that plants imbibe their nourishment either through their external surface or by prolongations of this into roots and leaves. On the other hand, animals nearly always possess an internal cavity, the *stomach*, into which the food is received, and where it undergoes a preparation; and the absorption of it into the system takes place by vessels distributed on the walls of this cavity. Plants require nothing but a regular supply of water, with carbonic acid, ammonia, and a small quantity of saline matter dissolved in it; and the conditions of their growth generally afford them a constant supply of these, which they can imbibe by means of their roots and leaves, without moving from the place in which they are once fixed. But animals can only be supported by materials previously organized, all their food being derived from vegetable or animal substances; this is nearly always in a solid state, and has to be reduced to a fluid form in order to be imbibed into the tissues.

The life of every animal presents a number of facts for observation; and these may be separated from each other according to their character. Thus, we might consider their *structure* only—the department of science which is termed *anatomy*. Or we might examine their *actions* or *functions*—in fact, the history of their lives—which is termed *physiology*. In pursuing either of these, however, we might restrict our inquiries to a single animal, though it would not be advantageous to do so. The objects of the zoologist are different. He sees that the several beings included in the Animal Kingdom may be regarded not only in their individual aspect, but in their relations to each other; that they form parts of one vast plan, as harmonious in itself as that of a beautiful building made up of a vast number of subordinate parts; and that, while the diversities of form and aspect seem almost infinite, they are evidently subordinate to certain general principles, which produce not only the manifest conformity, but the apparent departures from it. The grand aim of the scientific zoologist being to discover this plan, he employs *classification* as a means by which to facilitate his acquaintance with the vast number of beings that claim his attention.

CLASSIFICATION.

On looking at the variety of animal forms around us—such as we are familiar with as inhabitants of this country, or as natives of other climates collected for our observation—the mind naturally associates together those which have the greatest general resemblance, and separates these (although differing in some degree among themselves) from those with which they have greater dissimilarity. It is by pursuing this plan, from one stage or degree of resemblance and difference to another, that classifications are formed; and these will be correct according to the amount of knowledge upon which they are founded, respecting not only the external form but the internal structure of the objects they include.

Experience teaches that the offspring of any kind of animal is similar to its parents, though slight variations may be often traced between them; but a succession of beings having this general conformity is called a *race*. Now, the first object which the naturalist has to determine is, whether two races, such as the Negro and European races of man, or any two breeds of dogs, *might have* had a common origin. If he finds reason to believe that their differences are not greater than may be accounted for by the influence of accidental causes, and especially if he finds one race ever producing the form of another, he considers them as springing originally from a common stock, and as of one *species*, but if he cannot thus account for their differences, he regards them as of different species. This division of all the existing forms of animals into *species* is that on which the naturalist has to found all his subsequent classification; and it is necessary to take great care to avoid errors arising from variations in the forms of animals at different periods of their existence.

A number of species, differing from each other in trivial points, but having a strong general resemblance, are said to belong to one *genus*. The genera most

nearly allied are united into one *family*; several families into an *order*; and several orders into a *class*. The class, therefore, contains a very large number of species, many of them differing widely from each other, but all agreeing in some prominent and important character. And the classes composing the Animal Kingdom are arranged under four groups, on account of their correspondence in certain general particulars, and their difference in others: these are called *sub-kingdoms*. This is the alphabet of the science; and when this has been acquired, the student will proceed to his grammar, which consists of such a knowledge of the principal divisions of the animal kingdom, as will enable him to read the language of nature with understanding, so as to learn from the simple *name* much respecting the structure and character of the particular specimen, of which he would otherwise be ignorant.

PRIMARY DIVISIONS OF THE ANIMAL KINGDOM.

In considering the primary subdivisions of the Animal Kingdom, it is desirable to view them at first in their most simple aspect, and to regard merely the points of agreement among all the beings contained in each group, and their most striking differences from the members of other groups. The subordinate differences among the forms contained in any one of the primary groups, will be subsequently attended to. Following the arrangement of Cuvier, which in this respect is unexceptionable, we divide the animal kingdom into four sub-kingdoms—VERTEBRATA, ARTICULATA, MOLLUSCA, and RADIATA. The principal characteristics of these will now be pointed out.

The VERTEBRATA derive their name from the peculiarity of their skeleton, which essentially consists of a back-bone or spinal column, formed of a number of separate pieces, so united as to combine great strength with flexibility. These are termed *vertebræ*. Each is perforated with a large aperture; and, when all are united, a continuous tube is formed, in which is lodged the *spinal marrow*, a very important part of the nervous system (this is quite different from the *marrow* of other bones, which is an oily substance, subservient to their nutrition). At one extremity, the spinal column is extended into a large bony structure, the *skull*, which is especially designed for the protection of the *brain* (a large nervous mass, which may be regarded as an expansion of the spinal marrow) and of the organs of sense connected with it. At the other extremity it is contracted into a *tail*, the size and prolongation of which are usually greater in proportion to the small size of the skull. Connected with this spinal column are a series of *ribs*, which pass off from it on each side, and generally meet again in a breast-bone, enclosing a cavity (that of the chest), in which are contained some of the organs of nutrition. Appended to it are two pairs of *members* or *extremities*, which are usually the instruments of locomotion. Although these are very differently formed in the different classes, they are essentially the same in all. The arms and legs of man, the four legs of a quadruped, the wings and legs of a bird, and the fins of a fish, are all exactly alike in their position, and in the elements of which they are composed. The skeleton of the Vertebrata is *internal*, being clothed with the muscles by which its various parts are moved; and, from what has been said, it is evident that it is particularly destined for the protection of the nervous system, which, from the high place of this group in the scale of animal beings, is the organ of the greatest importance in the whole structure. Vertebrated animals are endowed with all the *special* senses—sight, smell, hearing, and taste—the organs of which are situated in the head; besides the *general* sense of touch, which is common to the whole body. They have all *red* blood, which is propelled through the system by a muscular heart. The mouth is furnished with two jaws, which are placed one *above* or *before* the other; there are never more than two, and they open sideways as in the Articulata. They are usually armed with teeth, which are in structure very analogous to bone.

The Vertebrata are characterized by a higher degree of *intelligence* than is possessed by any other group. The animal powers of sensibility and spontaneous motion are also greatly developed; and in accordance with these, a complete symmetry or correspondence between the two sides of the body is observable externally. But this symmetry does not extend to the organs of vegetative life, which are irregularly disposed in the cavities which they occupy.

In the ARTICULATA, the skeleton is *external*, enveloping not only the nervous system but the entire body, with the muscles which move it; these, as is well seen in the crab or lobster (which are the largest animals of this group), being attached to the interior of the firm casing. This skeleton is formed of a number of pieces or *segments*, jointed or *articulated* together—whence the name of the group. The centipede is a very characteristic illustration of this structure. The legs, as well as the body, are here seen to be enclosed in a firm envelope, of which the pieces are connected together by a flexible membrane; and the segments of the body are nearly alike along its entire length. But in the higher classes of this sub-kingdom, where the movement is performed entirely by the legs, as in Crustacea, or by the legs and wings, as in Insects, the segments of the body to which these are attached are firmly united together, in order to give their muscles a fixed point from which to act. But, in the lower classes, such as the leech and worm, where the extreme flexibility of the body, and the change of its dimensions, are the only means of locomotion (no members being present), the whole envelope of the body is so soft, that the division into segments is scarcely perceptible. The nervous system of the Articulata is not by any means so highly developed as that of the Vertebrata; in general, the organs of taste and vision are all that can be detected in them; those of hearing and smell being possessed only by a few of the higher tribes. The number of legs, when these are present, is often very great; they are never less than six. More than one pair of jaws usually exist, and they open laterally. The blood is white, and only in the highest classes is propelled by a powerful heart. The Articulata have their whole structure adapted to great activity of locomotion, and to the performance of *instinctive* actions of a high character. The class in which this is most evident—that of Insects—is by far the largest in the whole animal kingdom. The body, which is usually of small size, derives its principal bulk from the organs of *animal* life, especially the muscles which move the extremities; and the *lateral symmetry* is even more remarkable in them than in the Vertebrata, extending in part to the organs of nutrition as well as to those of sense and motion.

The group of MOLLUSCA must be described more by its negative than its positive characters. The body, as the name imports, is here soft, and destitute of any distinct skeleton. It is enveloped in a loose elastic skin, which is termed the *mantle*, and the outer surface of this has often the power of secreting a shell. But this shell is by no means adapted to the form of the animal; it has no regular series of joints for the purpose of facilitating the movement of the body, and it has no prolongations for giving protection and support to locomotive appendages. Moreover, of two species closely allied in general structure, it is often present in one and absent in the other, as in the snail and slug; and, when present in both, often differs much in form; so that it cannot be regarded as a part of the structure essential to our idea of a molluscous animal. That idea is principally founded upon the softness of the body, the high development of the organs of digestion, nutrition &c.—in fact, of the

system of *vegetative* life, which constitutes the bulk of the body; and, on the contrary, the low development of the powers of sensation and locomotion, and the organs of *animal* life. Many of them are entirely fixed to one spot during all but the very earliest period of life; and in the lowest species there is a tendency to aggregation into a compound structure, like that which is seen in the zoophytes. The number of Mollusca possessing *active* powers of locomotion is comparatively small; and of those which are not entirely fixed, the general character is *sluggishness*. The blood is generally white; and is often propelled by a powerful heart, and distributed through a complex system of vessels, even where the animal seems almost inert. Where any correspondence between the two sides of the body exists, it is usually restricted to those parts which are concerned in the functions of animal life; especially the head, on which the organs of special sense (when they exist) are placed.

The division RADIATA includes the lowest members of the animal kingdom, and those, therefore, which most nearly approximate to vegetables. There is a great tendency in the animals of this group to associate into compound structures, in which each individual has a certain degree of connection with the rest. Thus are formed those assemblages which, from their general resemblance to plants, are commonly called *Zoophytes* (animal-plants). But as, in investigating the characters of a tree, we study the separate flowers and leaves, so, in studying the zoophytes, we consider the individual polypes which form them. These polypes, in common with the higher kinds of radiated animals, which are formed to exist separately (such as the star-fish), are distinguished by the *circular* arrangement of their organs around a centre, in which their mouth is placed; and from this arrangement the name of the group is derived. There is thus a repetition of similar parts; and, as in most other instances where this is the case, a great power of reproducing those which have been lost. In many of the Radiata there is no distinct skeleton; in others a very firm support exists, almost always partaking of the circular arrangement of the soft parts. The sea-anemone is a good example of the lower forms of this group; the star-fish, or sea-urchin, of the higher: very few species belonging to it possess much sensibility or power of locomotion. In many instances there are no distinct blood-vessels, but the nourishment is conveyed to the tissues by direct absorption from the external surface and from the walls of the stomach.

SUB-KINGDOM—VERTEBRATA.

Setting off with the idea of a *vertebrated* animal as one possessing an internal bony skeleton, essentially composed of a jointed spinal column, containing the spinal marrow, and expanded at one extremity into a bony case for the reception of the brain, having usually members or appendages for locomotion, which never exceed *four* in number, endowed with all the five senses, and in general with considerable activity, having red blood, and altogether a more complex organization than the lower classes possess, as well as a higher degree of intelligence—we next proceed to consider upon what principles this extensive group may be subdivided into others, which, agreeing in all these particulars, shall yet differ in other important characteristics.

The ordinary observer would readily establish three subdivisions or classes, upon the three well-marked types of form which he perceives to be adapted to existence in the three different elements. He sees that one large group is entirely confined to the water; that the form of its body is peculiarly adapted for motion in that medium; that its members are constructed for most advantageous propulsion in it; and that it is incapable of existing, at least for any length of time, out of it. This group he calls by the name of FISHES; and he naturally associates with it some of a higher class, which resemble it in external appearance and mode of life. Another large group he observes to be formed to pass a great part of its life buoyed up only by the air; that the form of its body, the construction of its members, and the peculiar covering with which these are invested, specially adapt it for this peculiar mode of support, and for rapid motion through the element it inhabits; and that it is incapable of existing for more than a few minutes under water. This is the class of BIRDS; and with it, also, the ordinary observer associates a portion of a superior class, which is adapted in part to a similar mode of existence. A third group would consist of animals possessed of four legs, adapting them to a residence on the earth, and to motion on its surface; these would also be found to agree in their incapability of living beneath water like fishes, or of rising into the air like birds. But further examination of these *quadrupeds* would disclose some important differences in structure and vital actions, which separate them into two great divisions, very widely apart from each other. It is soon observed that some are *warm-blooded*, maintaining a constant and elevated temperature, while the others are *cold-blooded*, their bodily heat varying with that of the atmosphere, and in general being but little above it; that the former are covered with hair or something analogous to it, while the latter are coated with scales; and that the former produce their young alive, or are *viviparous*, and nourish them afterward by suckling, while the latter rear them from eggs, or are *oviparous*. Hence this group is subdivided by the naturalist into two, of which one—that of MAMMALIA—is superior in its general organization to birds, while the other—that of REPTILES—is intermediate between birds and fishes. The scientific characters of these groups will next be considered.

FISHES are oviparous vertebrata, inhabiting the water, and respiring that element by means of *branchiæ* or gills, which are filamentous prolongations of the surface, into which the blood is propelled, in order to be brought into relation with the air contained in the surrounding water. The heart only contains two cavities; one of these receives the blood which returns from the system, and the other propels it through the gills, from which it is conveyed by the blood-vessels to the body at large. They are in general cold-blooded, but few of them maintaining a temperature above that of the surrounding medium. Living habitually in an element which is nearly of the same specific gravity with their bodies, fishes have no weight to support, and have only to propel themselves through the water. Accordingly we find their structure adapted for great freedom of motion, rather than for firmness and solidity; progressive motion is chiefly accomplished by the lateral action of the spine, which is endowed with great flexibility. The vertebræ, instead of being articulated by a flat surface, as in the Mammalia, or by a ball-and-socket joint, as in serpents, have each of their surfaces concave, and these glide over a bag of fluid, which is interposed between each pair of vertebræ. The tail is flattened vertically; and it is by its movement from side to side that the fish is urged forward as a boat by a sculler. The *pectoral* fins, which answer to the hands of man, and the *ventral* fins, which represent the feet, serve rather as *steering* than as *propelling* organs, and they also assist in raising and depressing the animal in the water. In a large proportion of this class, the skeleton is cartilaginous only; and in a few of the lowest the vertebral column is not divided into distinct portions, but forms one continuous tube of gristle, or even of membrane only. The surface of the body of fishes is almost always covered with scales; and these are sometimes quite bony, and fitted closely together, especially where the internal skeleton is soft.

REPTILES are also oviparous, cold-blooded vertebrata

but in their adult state they breathe air, which is introduced into *lungs* or internal cavities; and they mostly are formed to live on land—those which inhabit the water being obliged to breathe at the surface. Their heart possesses three cavities, one of which receives the blood from the lungs, and another from the system at large; the pure and impure blood are mixed in the third cavity, and the fluid is propelled by it partly to the lungs and partly to the body. Thus only part of the blood expelled from the heart is exposed to the influence of the air at each contraction; and this deficiency is accompanied by a general inertness of the other functions. Their motions are chiefly confined to crawling and swimming; for though a few at times can run and leap very quickly their general habits are sluggish, their sensations obtuse and their digestion slow. Hence they can exist for a long time with a very feeble exercise of these functions, under circumstances that would be fatal to animals in which they are performed with greater activity. In cold and temperate climates they pass the whole winter in a state of torpidity. There is greater diversity of form and structure among the members of this class, than in any other division of the vertebrated series. The *tortoises*, *lizards* and *serpents* appear so different, that a common observer would separate them widely; and yet they not only agree in all the foregoing characters, but pass into each other by links of transition so gradual that it is difficult to classify them. There is one group which, in its adult condition, bears a general correspondence with reptiles, and has been commonly associated with them; but which only arrives at this condition by passing through a kind of metamorphosis, like that of insects: this is the *frog* tribe, which includes several animals bearing the form of lizards and serpents, but differing, from them in having a soft naked skin, instead of a scaly one, and in passing the early part of their lives—that which, in the frog, is called the *tadpole* state—in a condition like that of fishes in all essential particulars. These differences have been regarded by some naturalists as establishing their title to rank as a distinct class, to which the term Amphibia has been given.

Birds are, like fishes and reptiles, oviparous vertebrata, and, like the true reptiles, they breathe air during the whole of their existence; but they are warm-blooded, having a heart with four cavities and a complete double circulation, by which all the blood returned from the system is transmitted to the lungs, before being distributed to it again. This high amount of oxygenation of the blood is accompanied by great activity and energy of all the organic functions, acuteness of the senses, and rapid and powerful locomotion. The class is further distinguished by the position of the body upon two legs only, and by the modification of the anterior members for wings; by the covering of the body with feathers, or something analogous to them; by the deficiency of teeth, in place of which the jaws are furnished with a horny covering or bill; and by various other characters of less importance. There is a peculiar conformity in the general structure and aspect of all the members of this class, with which scarcely any other animals are liable to be confounded. Birds have been not inappropriately termed the insects of the vertebrated classes.

The Mammalia agree with birds in possessing a complete double circulation and warm blood; and with reptiles in breathing air, and generally living on the surface of the earth; but they differ from all other vertebrata, not so much in producing their young alive (which is the case in a few species of reptiles and fishes), as in their subsequent nourishment of them by suckling—from which circumstance the name is derived. This class is placed at the head of the animal kingdom, not only as being the one to which man belongs, but also because it is that which enjoys the most numerous faculties, the most delicate sensations, the most varied powers of motion; and in which all the different faculties seem combined to produce a more perfect degree of intelligence; the one most fertile in resources, most susceptible of perfection, and least the slave of instinct. Although principally adapted to motion on the ground, we find one tribe possessed of the power of rising into the air like birds, and another formed to inhabit the water like fishes; but both these agree with other Mammalia in all essential characters, and differ very widely from the classes with which their habits seem to associate them. To the Mammalia is confined the protection of the body by hair or fur; the nearest approach to it being in the hair-like feathers of a few species of birds. But the presence of this covering is by no means universal in the Mammalia.

Class I.—Mammalia.

The Mammalia are universally regarded as constituting the highest group in the animal kingdom; not only from being the one to which man belongs (so far, at least, as his bodily structure is concerned), but also as possessing the most complex organization, adapted to perform the greatest number and variety of actions, and to execute these with the greatest intelligence. The contrast is here extreme between the *reasoning* and the *instinctive* powers. When we compare the sagacity of a dog, and the great variety of circumstances in which he will display an intelligent adaptation of means to ends, with the limited operations of the insect, over which the judgment and will seem to have no control, we cannot help being struck with the difference. The one is *educable* in the highest degree next to man; the other could not be made to change its habits by the most prolonged course of discipline. In ascending the animal scale, we observe the instincts gradually becoming subordinated to the reasoning powers; and this may be particularly noticed among the members of the class under consideration, which exhibit much variety in this respect.

If we regard intelligence as the chief characteristic of the Mammalia, we should perhaps rest upon the principal varieties in the degree in which this is possessed by the several subordinate groups, as the groundwork of our division of the class into orders. But for the sake of convenience the naturalist seeks for other characters, and more particularly aims to establish his classification upon such as are external and easily recognised. Such a classification will be *natural*, that is, will most nearly associate together the animals that have the greatest general resemblance, and will most widely separate those which have the least, in proportion as the characters which are selected for the purpose may be regarded as indicating the general conformation of the several animals. In this respect, the structure of the extremities, and the arrangement of the teeth, are found to be the most valuable.

From the general structure of the extremities, we may learn much of the habits of the animal, and the adaptation of its whole organization to a particular mode of life. These, for example, would be at once determined by an inspection of the wing of a bat or the flapper of a whale. Hence we shall not be far wrong if we throw into distinct groups all the Mammalia possessing one or other of these modes of conformation. But among those which are adapted to walk upon land, we must seek for some slighter differences; and such we may in the first place look for in the organs of touch, since on these will depend much of the address of the animal, and a number of differences connected with the amount of its intelligence. The degree of perfection of the organs of touch is estimated by the number and mobility of the fingers, and the greater or less extent to which their extremities are enveloped by the nail or hoof. When the fingers are partly absent or consolidated together, and a hoof envelops all that portion which touches the ground, it is

obvious that the sensibility must be blunted, while at the same time the extremity becomes incapable of prehension or grasping. The opposite extreme is where a thin nail covers only one side of the extremity of the finger, leaving the other possessed of all its delicacy; and where several such fingers exist, of which one can be opposed to the rest, so as to render prehension more perfect, and to perform a great variety of actions.

Another important series of characters is furnished by the teeth, which are varied in structure and arrangement according to the nature of the food; and it is obvious that, as to each kind of food the means of obtaining it must be adapted, certain forms of the extremities and of the teeth will be found together. Not only will the correspondence extend thus far, but to the whole interior structure of the animal also. The organs of the senses, and the digestive system—the one employed in obtaining the food, and the other in assimilating it—will in particular exhibit this adaptation; and thus we should find that the structure of the whole animal is so far connected with that of its teeth and extremities, that it might be predicted from the inspection of them. The extended application of this general fact to the determination of the characters of the animals whose fossil remains are so abundant in many parts of the crust of the earth, is the labour which will chiefly render the name of Cuvier immortal.

A primary division of the class Mammalia, however, may be founded on a character more important than any of the foregoing. As already mentioned, the animals of this group are distinguished from most others by producing their young alive—that is, having nearly their adult form, and being capable of executing spontaneous movements, and, to a greater or less degree, of seeking their own nutriment, from the time of birth; and they differ from all others in affording their young a subsequent nourishment secreted from their own bodies. But there are several among them, which produce their young in a state so immature, having so little of the form of the species, and so nearly motionless, that they can be scarcely called alive; and it is only after having been for some time nourished by suckling, that they attain a degree of development corresponding to that at which other young mammalia are born. Now, it is a general law that, the higher the grade of development a being is ultimately to attain, the more it requires to be assisted in the early stages of that development by its parent; and accordingly, the animals in which the intimate connection between the parent and the offspring is separated at the earliest periods, are those which attain the lowest permanent condition. In this case, the inferiority in the general organization of the mammalia thus produced, to that of the others, is sufficiently evident to the naturalist; and it is manifest in their low amount of intelligence, as well as in their bodily structure, which presents many points of affinity with birds and reptiles. We may accordingly divide the class Mammalia into two sub-classes, the truly *Viviparous* and the *Ovo-viviparous** Mammalia. The first comprehends by far the largest proportion of the whole, and nearly all the best-known animals. The latter contains comparatively few.

The truly Viviparous Mammalia may then be subdivided, according to the structure of their extremities, into the *Ungulated*, or hooted, and the *Unguiculated*, or clawed. Hoofed animals are necessarily herbivorous, inasmuch as the conformation of their feet precludes the possibility of their seizing a living prey; and they have flat-crowned grinding teeth for triturating their food. These teeth have irregular ridges on their surface, occasioned by the slower wearing of their harder portions; and by these, aided by the lateral motion of the jaws, tough vegetable substances are reduced to a pulp. Animals with unguiculated fingers are susceptible of more variety; their food is of different kinds; but it may at once be known from the form of the grinders, and from the degree of mobility and delicacy of the fingers. In some, the grinders are formed, like those of the hoofed animals, to triturate vegetable substances by elevated ridges; and in these the extremity has the least power of varied movement, the habits of the animals assimilating to those of the Ungulata. In others, the grinders are very narrow, and are formed with sharp points and edges, cutting like the teeth of a saw; these are adapted for dividing animal flesh, and the jaws are fitted together like the blades of a pair of scissors, having no action but a vertical one. In others, again, the summits of the grinders are raised, not into cutting edges, but into conical points; and they are thus adapted for breaking down the hard envelopes of insects, upon which such animals prey. Finally, in mammalia which are adapted to a variety of food, but which employ rather the soft and pulpy than the tough and stringy parts of plants, the summits of the grinders (which are covered entirely with enamel) are raised into flattened knobs or tubercles, adapted rather for crushing and bruising than for grinding or cutting. This is the case in man and most of the monkey tribe. Thus, by the form of the grinders, the nature of the food may be at once known.

In front of the grinders or *molar* teeth, we find in all the tribes that subsist entirely or in part on animal food, and in some of the vegetable-feeders also, a single pointed projecting tooth on each side, which is termed *canine*, from its large size and prominence in the dog. It is very large in all the truly carnivorous animals, and it enables them to lay a firm hold of their prey. It is also large, however, in some animals which are chiefly herbivorous, as the boar; and in these it seems chiefly intended as an organ of offence and defence. Between the canines, and occupying the front of the jaws, are the *incisors*, or cutting teeth, the purpose of which is nearly the same in all animals which possess them, namely, to divide the food that is to be introduced into the mouth. When they are altogether absent, the food is obtained by the tongue. In the truly Viviparous Mammalia there are never more than six incisors in each jaw.

I. The variations in the form and arrangement of the teeth, taken in conjunction with the differences in the structure of the extremities, enable us to subdivide the *Viviparous* Mammalia into ten orders. In the first place, they may be separated into the *Unguiculated*, containing eight orders, and the *Ungulated*, containing two only. Of the former group, some have all three kinds of teeth, whilst others are deficient in one or more of them.

A. The *unguiculated* animals having three sorts of teeth may be divided into the six following orders:—

1. Bimana.—This contains man only, who is characterized zoologically by the adaptation of his frame to an erect posture, supported upon his posterior extremities only, and by possessing *hands* (that is, feet with opposable thumbs) on the superior extremities only.

2. Quadrumana.—This order includes the apes, monkeys, &c., which have hands on all four extremities.

3. Cheiroptera.—In this order, known as the bat tribe, the anterior extremities are formed into wing-like organs, which enable the animals to rise into the air like birds.

4. Insectivora.—The animals of this tribe, which includes the hedgehog, mole, &c., have the peculiar adaptation of their teeth to insect food, just now described.

5. Carnivora.—In this very extensive group, of which the cat tribe may be taken as an illustration, the teeth manifest, in the most remarkable manner, the adaptation to devour animal flesh.

* This term is perhaps not altogether scientifically correct, but to employ any other would involve explanations unsuited to the character of this work.

6. Cetacea.—This order, properly restricted to those members of the whale tribe which feed on animal substances, follows very naturally on the aquatic forms of the Carnivora; since its digestive system exhibits the same general character, although the adaptation of the extremities for swimming prevents them from showing the same form.

The two other orders of Unguiculated Mammalia are adapted partly to vegetable, and partly to animal food. They are—

7. Rodentia.—In these the toes differ but little from those of the Carnivors; but the jaws are deficient in true incisors, their place being supplied by the canines, which are brought very much forward (so that a wide interval exists between them and the molars), and are adapted to gnawing. This order includes the beaver, rat, hare, &c.

8. Edentata.—This order is so named from the absence of front teeth, sometimes also of canines, and even of molars. The extremities of their toes are nearly included in large nails, which approach in character to hoofs. To this order belong the sloth, ant-eater, armadillo, &c.

B. The *Ungulated* Mammalia form two orders only—those which *ruminate* (or chew the cud), and those which do not. The latter differ much among each other, but are associated into one order:—

9. Pachydermata.—In some of these the toes are still partly separated, in others they are entirely united. The food is mostly vegetable; all three kinds of teeth are sometimes present; in some the canines, and in others the incisors, are deficient. Besides the elephant, horse, hog, &c., this order properly includes certain aquatic forms, which have been commonly associated with the Cetacea, but which are strictly herbivorous, and approach very nearly to the hippopotamus.

10. Ruminantia.—This order, containing the ox, sheep, deer, &c., is a very distinct one, and is characterized by its cloven feet, the absence of incisors in the upper jaw, and the complex arrangement of the stomach, by which rumination is effected.

II. The sub-class *Ovo-vivipara*, is easily divided into two orders—the one having a pouch, or *marsupium*, in which the young are received and nourished for some time after their birth, and the other being destitute of it.

11. Marsupiata.—The animals of this order, which includes the opossum, kangaroo, &c., differ considerably among each other in their food and habits; and the arrangement of their teeth, or their *dentition*, varies accordingly. They have mostly three kinds of teeth, the incisors more than six in number, and their feet are unguiculated, with an opposable thumb, in some instances, on the hind foot.

12. Monotremata.—This is unquestionably the group which approaches most nearly to oviparous animals. It contains only two genera, in one of which the teeth are altogether absent; and in the other nearly so, the jaws being covered with a horny bill. In addition to five claws on each foot, the males have a peculiar spur on the hind ones, like that of a cock.

The foregoing arrangement, founded entirely on external characters, does not give an altogether accurate representation of the relative intelligence of the different orders. If this be taken as the guide, we should first arrange the Viviparous Mammalia into a *Zoophagous* (or animal feeding) and a *Phytophagous* (or vegetable-feeding) series, of which the former will rank highest on the whole, although the highest of the latter may surpass its lowest forms.

The *Zoophagous* subdivision will include the Bimana, Quadrumana, Carnivora, Insectivora, Cheiroptera, and Cetacea.

To the *Phytophagous* belong the Pachydermata, Ruminantia, Rodentia, and Edentata.

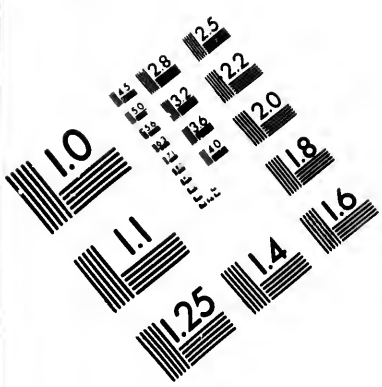
These last approach most nearly of the *Vivipara* to birds in the structure of their brains; but a still lower type is exhibited by the *Ovo-vivipari*, which are unquestionably the lowest of the Mammalia in point of intelligence.

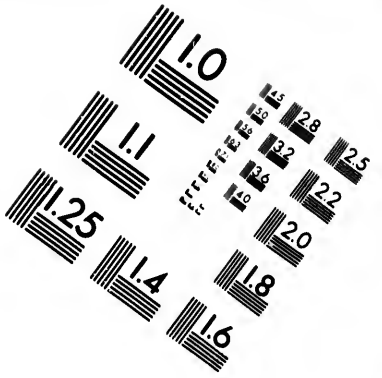
Order I.—Bimana.

If we regard the possession of intelligence as the peculiar characteristic of the class Mammalia, we can have no hesitation in selecting the order Bimana, to which Man alone belongs, as the *type* of the group, being the form most unlike that of any other groups on which this class borders. It has been already pointed out, that there is an important connection between the high development of the bodily structure and of the intelligent powers of this class, and that peculiarity which distinguishes it from all others, namely, the prolongation of the period during which the young is dependent on its parent for support. And this prolongation is greater in the human species, in proportion to the whole length of life, than in any other; and it has evidently a direct connection with the ultimate high development of the mind and body of the offspring, and also a most important indirect influence on the social condition of the human race. Thus man, presenting in the highest degree the characters which have been stated as distinctive of the Mammalia, is rightly placed at the head of the class, although, as will presently appear, he is in many other animals in particular portions of their organization.

The order Bimana includes only the single genus *Homo* or *Man*. Man is the only one of the carnivorous animal to which the erect position is natural, and in which there is an essential difference in the organization and function of the two pairs of extremities. In those of the monkey tribe whose form approaches most nearly to his, the erect posture is not natural but constrained; and none of those agile movements so peculiar to the group can be exhibited, unless the body is supported in front as well as behind. All the extremities of these animals are alike formed as organs of prehension; in the Carnivora, all are alike organs of prehension and support; in the hoofed animals, all are organs of support alone; in man, the anterior or upper extremities are entirely for prehension, and the posterior or lower entirely for support. When we examine these more particularly, we observe that each pair is adapted to its respective use in a higher degree than the extremities of the monkey or any other animal. The foot of man is broad, and its surface expanded; and the leg bears vertically upon it, the heel resting upon the ground. In the monkeys it is a sort of oblique continuation of the leg, as the hand of the arm, and supports the body chiefly by its powers of prehension. The whole structure of the body is adapted to being exclusively supported by the feet. The legs are so long, that man could not, if he wished it, walk on all fours; his short and nearly inflexible foot, and his long thigh, would bring his knee to the ground; whilst his widely-separated arms, and his shoulders, which are but loosely attached to the trunk, would ill support the fore part of his body.

But by the adaptation of his whole frame to the erect posture, his upper extremities are left at entire liberty, while his organs of sense are most favourably situated for observation. The hand of man is adapted to a far greater variety of purposes than that of the monkeys, in which it is most perfect. Its power consists chiefly in the size and strength of the thumb, which can have its tip brought into opposition with that of any of the fingers; and all these are capable of being moved separately. In none of the monkeys can the thumb be opposed to the fingers with any degree of force, and in many their tips cannot be brought into contact; so that, though admirably adapted for clinging round bodies of a certain size, such as the small branches of trees, their hands can neither seize very minute objects nor support large ones. To the hand of man some have attributed his superior





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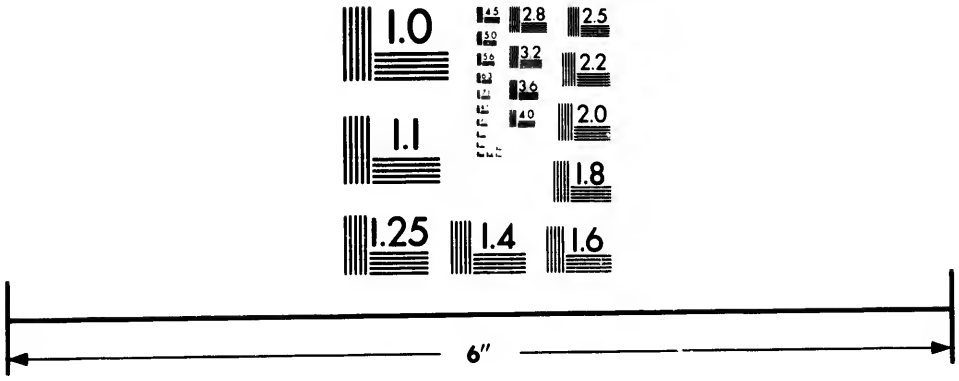

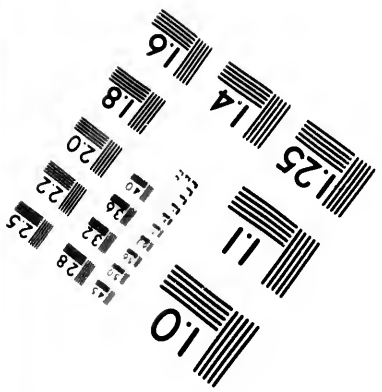

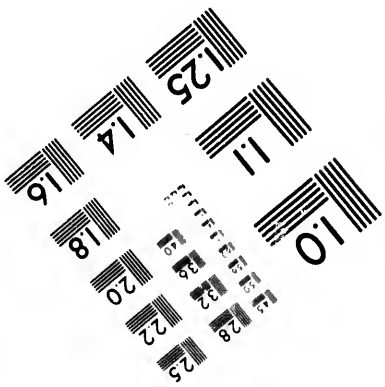

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lity; but it may be safely said that he owes this to his mind and its instruments conjointly. The hand would be useless without the mind to direct it; and mankind, if handless, would soon be reduced to a very subordinate kind of existence, if not speedily extinguished altogether.

Man, possessed of so remarkable a means of executing that which his mental ingenuity devises, is less provided, in regard both to acuteness of sensibility and to muscular power, than many other mammalia. His swiftness in running is inferior to that of other animals of his size. The smallness of his face, compared with that of the cranium, shows that the portion of the nervous system connected with the external senses is less developed in him than in most other animals. Accordingly, he is surpassed by many in the acuteness of his sensibility to light, sound, &c. But he stands alone in the power of comparing his sensations and drawing conclusions from them. Moreover, although none of his senses are very acute in his natural state, they are all moderately so, which is not the case in other animals; and they are capable (as is also his swiftness of foot) of being much improved by practice, especially when circumstances strongly call for their exercise.

This improvability is one of the most remarkable characteristics of the bodily as well as the mental constitution of man. It is to a gradual advance in both, that the civilized races now enjoy so much of comfort, and of means of still further elevation. In the processes by which these are attained, we observe a remarkable difference between the character of man and that of other animals. The arts of which these are capable are limited and peculiar to each species; and there seems to be no evidence of a power of invention, or of construction for any purpose, beyond that to which the original and instinctive powers are adapted. Hence it would appear that there is no proof of any species or race among the lower animals ever making an advance towards an improvement or an alteration in its condition; and where a particular adaptation of means to ends, of actions to circumstances, is made by an individual (as is often the case where some amount of intelligence or rationality exists), the rest do not seem to profit by it.

Man is as much distinguished, then, from the lower animals, by his mental as by his corporeal endowments. Yet they are not of a *kind* altogether different from that which we may elsewhere see. In common with the inferior tribes, he possesses strong instinctive propensities, which are kept under control, however, in a well-balanced mind. But when the reasoning powers are undeveloped, as in early childhood and idiotcy, the exclusive sway of the instincts is obvious. The more violent passions and emotions are nearly akin to these; and whilst they give great activity to the operations of the mind, it is requisite that they should be duly restrained by the intellect and will. This power of internal regulation is one of the most striking characteristics of the human mind above that of animals, which possess like it reasoning faculties, often to no mean extent, and are actuated by emotions and moral feelings. One of the most important aids to the use and development of the human mind, is the power of producing articulate sounds, or language; of which, as far as we know, man is the only animal in possession. There is no doubt that many other species have certain powers of communication among individuals; but these are probably very limited, and of a kind very different from a verbal language.

The more we study the physical and mental constitution of man, the more are we led to the belief, that it is in the adaptation of the whole to a great variety of circumstances that its great perfection consists. There seems scarcely any condition in which he cannot support himself. He is capable of sustaining the lowest as well as the highest extremes of temperature. His diet is naturally of a mixed kind; but he can support himself in health and strength on either animal or vegetable food exclusively. At the same time, it is by the demands which his peculiar condition makes upon the exercise of his ingenuity, that his mental powers are first called into active operation; and, when once aroused, their development has no assignable limit.*

Order II.—Quadrumana.

The order Quadrumana, which takes its name from the peculiar conformation of the extremities of the animals composing it—all four of them having one of the toes opposed to the rest, like the thumb of man to his fingers—are remarkable for their facility in climbing, which they gain by the *grasping* power conferred upon them by the possession of *four hands*. Their anatomical structure refutes the common idea, that the upright position is natural to them; and it is certain that, though they may be taught in a state of captivity to walk erect like men, they usually support themselves by their anterior as well as their posterior limbs. It may be observed, that those species which approach the nearest to man rest upon the outer side of the foot only, and not upon its sole, when imitating his position; and that they are very insecure in it. And to those which are intermediate between the higher Quadrumana and the succeeding orders, the maintenance of the erect position without support, for any length of time, is impossible. It might be supposed that the possession of "four hands" is a character which raises the animals possessing it above two-handed man; but a little reflection will show that this is not the case, since the hand even of the highest Quadrumana is very inferior to that of man in complexity of structure and in the variety of movement to which it is adapted, whilst that of the lower shows but a slight advance upon the foot of the Carnivora. A corresponding series of gradations may be traced in the aspect of the face; for while, at one end of the series, the muzzle (at least in the young animal) is not much more prominent than it is in some races of man, at the other it nearly resembles that of other mammalia. Nevertheless, throughout the order, a certain degree of resemblance to man may be perceived, in the gestures as well as in the general aspect of these animals. All of them, like man and the Carnivora, possess three sorts of teeth; the canines, in the full-grown animal, are much more developed than in men; and there are intervals between them and the other teeth, which are not present in his jaws, but exist in all other mammalia.

Monkey.

The Quadrumana may be divided into three families—the Simiadæ, or Monkeys of the Old World; the Cebidæ, or American Monkeys; and the Lemuridæ, or Lemur tribe, which supply the place of monkeys in Madagascar and some parts of Africa and India. This restriction of distinct types of structure to different portions of the surface of the globe, is not a little remarkable; and it may be traced even in the subordinate divisions.

The Simiadæ include all the animals of the Old World known as apes, monkeys, and baboons—names which are commonly bestowed according to the development of the tail, the apes having none, the monkeys having a long one, and the baboons a short one. All these have ten molar teeth only in each jaw; and they have the partition between the nostrils very slender, so that the apertures are close to one another, as in man. On the other hand, all the Cebidæ are possessed of a tail, which is an extremely important organ to them,

* For a detailed inquiry into the characters of the different races of mankind, see PHYSICAL HISTORY OF MAN.

having great prehensile powers; they have *twelve* molar teeth in each jaw; and the partition between the nostrils is thick, so that the apertures are wide apart, as in the lower animals. The thumb of the hand, or fore foot, is not opposable; and it is entirely wanting in some of the genera. The LEMURIDÆ are distinguished from the monkeys, partly by the greater prolongation of the muzzle, the possession of a large bushy tail, (which is not, however, prehensile,) of opposable thumbs on all the feet, and of a crooked and pointed claw on the first hind finger. In their teeth, they present an approach to the type of the Insectivora.

1. The SIMIADÆ must be regarded as the types of the Quadrumanous order; and amongst these the *Apes* manifest, in the most striking manner, the peculiar characters of the group. These are distinguished from the other subdivisions, in part by the absence of a tail, but also by the want of the cheek-pouches and of the callosities, or hard spots on their haunches, destitute of hair, which the monkeys and baboons possess; and further, by the predominance in length of the fore feet or arms over the hinder ones. The most remarkable species of this group are the *chimpansee* and *orang-outang*; the former a native of equinoctial Africa, and the latter of the peninsulas and islands of Eastern Asia. Contrary to the general opinion, it is in the first of these that the greatest number of points of resemblance to man are to be found. Both these animals attain considerable size when full grown; probably in their native climate the former rising to five feet, and the latter to seven; but no living specimens of those sizes have ever been seen in this country. In both, there is a remarkable difference between the young and the adult form of the skull—the young bearing the greatest resemblance to that of man, while in the adult, the muzzle is so much prolonged, and the canine teeth are so much developed, as to give the face much more the aspect of that of the baboon. This difference, together with a change in the colour of the hair, has caused specimens of the orang-outang, at different ages, to be accounted distinct species. The character of the animal also changes, being mild and gentle when young, but having a good deal of baboon-like ferocity when come to its full development. In the *Gibbons*, or long-armed apes, the length of the anterior members is so great, that they touch the ground when the animal is in a semi-erect attitude; these present an approach to the monkeys, in the possession of callosities on the buttocks by some of the species.

The *Monkeys* of the Old World are distinguished (in addition to the characters which separate them from the Cebidæ) by the possession of cheek-pouches, callosities, and a tail, which separate them from the apes; the tail is longer than in the baboons, the muzzle less protuberant, and the aspect less ferocious. The group contains, however, some species which present an approach to the apes, and others which form a transition to the baboons. The true Monkeys are also remarkable for the shortness of the arms in proportion to the legs, which causes some species to walk on all-fours with difficulty, climbing being their usual mode of locomotion; but, by common observers, they are still more noticed for the beauty of their colouring, their activity of movement, and gentleness of demeanour. Their character is much changed, however, by confinement. They are found in almost all the tropical countries of the Old World, and particular genera have a peculiar local distribution. Many of them live in societies, chiefly inhabiting the woods, but committing great devastations on any cultivated ground in the neighbourhood. In several species the aspect of the head is extremely grotesque, as are also the attitudes of the animal. The number of species is altogether considerable. Their food seems to be rather vegetable than animal; and in one genus this is distinctly indicated by the structure of the teeth and of the stomach. One genus, restricted to Africa, is destitute of thumbs on the anterior extremities, and the deficiency is partly supplied by the great development of the tail, which is not, however, prehensile, as in the American monkeys.

The *Baboons* have usually a short tail, or none at all; but there is much variation in this respect. They are rather distinguished from the apes and monkeys by the protuberance of the muzzle, and the ferocity of aspect which is partly dependent upon this; the canine teeth are generally large and strong. The Baboons have also a large bag connected with the organ of voice, by the resonance of which the power of their loud and discordant cries is greatly increased. In a state of captivity, the Baboons exhibit less docility than any others of the order. They are by no means devoid of intelligence; but they do not seem capable of being steadily attached by kindness, and generally exhibit an alternation of moody sullenness and violent outbreaks of passion. Their resentment of injuries is often manifested for a long time afterwards.

2. The Monkeys of the New World, composing the family CEBIDÆ, differ from those of the Old, not only in the number of their grinders and the disposition of the nostrils, already mentioned, but in the entire absence of the cheek-pouches and callosities, and also in the conspicuous character, and the importance as a member, of the tail, which is usually prehensile in these monkeys, and capable of being twisted round branches so firmly as entirely to support the animal. In general, the thumbs of the anterior members are not opposable; and they are sometimes scarcely developed at all. The Cebidæ are generally of smaller size than the Simiadæ, none of them attaining nearly the dimensions of the chimpansee, orang-outang, or mandril; they are also less malicious, more easily tamed, and susceptible of a more constant attachment; but they seem to possess less intelligence. They are found in very large numbers in the woods of South America, where they chiefly subsist on vegetable food, to which their teeth show a peculiar adaptation. The largest of them are the *Myceti*, or howling monkeys, which derive their tremendous powers of voice from a sort of hollow drum connected with the larynx (somewhat resembling that of the baboons), which is peculiar to them among the Cebidæ. They are shaggy animals, about the size of a fox. The *Ateles*, or spider-monkeys, are remarkable for the length and prehensile power of their tails, and for the absence (in some species entire, in others nearly complete) of the thumb; whence they are called four-fingered monkeys. A large number of other genera, including many species, might be enumerated; some of these are remarkable for their nocturnal habits; and others for their carnivorous propensities.

3. The third family of Quadrumana, that of LEMURIDÆ, has in many respects the general aspect of the American monkeys; but the muzzle is much prolonged resembling that of insectivorous or carnivorous animals, the teeth, also, are modified for animal food, presenting sharp tubercles, locking into each other; and the grinding motion of the lower jaw is reduced, so that its action possesses more of the scissors-like character of that of the animal-feeders. The four thumbs of these animals are well developed and opposable; the claw-like aspect of the nail of the first hind finger has been already noticed as one of the most easily recognised characters of the family. The canines in the lower jaw have the character of additional incisors; and the first molars resemble the ordinary canines. The total number of teeth in each jaw is eighteen, as in the American monkeys. The *true Lemurs* are distinguished by their very large and handsome tails, which are elevated when the animals are in motion, and not trailed after them. They average the size of a large cat, but have longer limbs. They are nocturnal or twilight animals, passing the day in sleep, rolled up in the form of a ball; at night they rouse them-

selves, and spring with the greatest activity in search of their food, which principally consists of fruits. These are entirely confined to Madagascar, where at least thirteen species are known to exist, differing from each other but little except in colour. On the other hand, the *Galagos*, which are found in the neighbourhood of the river Senegal are pre-eminently insectivorous.

This group is connected with the Cheiroptera by a very remarkable animal—the *galeopithecus*, or flying-lemur, which so much resembles the bats, as to have been placed with them by many naturalists. It is, however, a *lemur* in all its essential characters, but it has its limbs connected by thin skin, which they stretch out, as the framework of an umbrella supports its covering. By this singular structure the animal is supported in the air, as by a parachute; but it has not the power of sustaining a continued flight, though it can leap a distance of a hundred yards with a gradual descent. Like the bats, it feeds on insects, and sleeps with its head downwards, suspended by its hind legs. It is a native of the Indian archipelago.

Order III.—Cheiroptera.

The order Cheiroptera (formerly arranged by Cuvier as the first family of the order Carnaria) is perhaps the most distinctly circumscribed group of the whole class Mammalia; for all the animals composing it agree in the possession of a pair of wings, formed by an extension of the skin over the very elongated fingers of the fore legs, and connected also with the hind legs, by which they are adapted to raise and sustain themselves in the air, and also to propel themselves through it by regular continued movements, in precisely the same manner as birds. Now, although in other groups we may observe a tendency towards the same adaptation, it is never carried farther than to give to the animal possessing it the power of partially supporting itself in the air, so as to prolong its leaps, as is the case with the flying-squirrel, the flying-lemur, and flying-opossum. None of these animals can really *fly*, like bats and birds.

We see in the bats a very interesting modification of the whole character of the mammal, to enable it to lead the life of a bird, just as in the whale tribe we see a similar adaptation to the life of a fish. The insectivorous bats bear a strong analogy to the swallow, in the character of the food itself as in the mode in which they obtain it—by the rapid pursuit of insects on the wing; the chief difference in habit being the time at which they respectively go forth in search of their prey.

The whole structure of the Cheiroptera is obviously adapted to the fulfilment of the object which is the distinguishing character of the group. All the bones of the upper extremity, as well as those which give attachment to its muscles, are very largely developed. The member itself, although consisting essentially of the same parts as in man, has its aspect greatly changed by the extraordinary prolongation of the finger bones, upon which chiefly the skin of the wings is stretched. This skin is extremely thin, and is generally devoid of hair on both sides. It extends not only between the fingers, but from the last finger to the posterior extremity, and from this to the tail, where one exists. This expansion of the tail probably serves as a rudder, enabling the animal to change its course rapidly in pursuit of its insect prey—an idea which is supported by the fact, that in the bats which feed on vegetable substances, or on animals which require less activity of pursuit, this part is either wholly wanting or is much circumscribed in extent and power.

The four fingers of the anterior extremity being involved in the expansion of the membrane, only the thumb is left free; this is of moderate length, and is furnished with a crooked nail, which is of great use to the animal in climbing and making its way along the ground. The toes of the hind feet are short, and furnished with claws, by which the bats suspend themselves from the trees or walls on which they rest, hanging with the head downwards. They walk with slowness and difficulty when placed on the ground; the wings are folded up; and they rest upon the hind feet, and upon the claw of the thumb, by which they crawl forwards, pushing on first one side and then the other. But they can climb up perpendicular surfaces with considerable agility. The expanded skin of the wings appears to be endowed with a sensibility of a peculiar kind, enabling the animals to perceive their proximity to solid bodies without the assistance of sight. That they have a very accurate perception of this kind was long ago shown by the experiments of Spallanzani, who found that bats deprived of sight, and, as far as possible, of hearing also, were still capable of directing their flight with security and accuracy, finding their way through passages only just large enough to admit them without coming in contact with the sides, and even avoiding numerous small threads which were stretched across the room in various directions—the wings, never, even by accident, touching them. It is probably through the vibrations of the air, which will differ according as the wing strikes it in the neighbourhood or the absence of any solid body, that the knowledge of the proximity of such is communicated to the delicate and expanded organ of touch. The use of this curious power to animals intended to execute rapid and varied movements in the dark, and among trees, buildings, &c., is sufficiently evident.

This tendency to a great extension of the skin is manifested in other parts of the body. In many bats, especially of the insectivorous kind, the external ear is enormously developed; being, in the long-eared bat of this country, nearly as long as the body. In the frugivorous bats, it is of ordinary size. The organ of smell, too, in many of the insectivorous bats, is furnished with curious leaf-like appendages, formed of the integument doubled, folded, and cut into the most curious and grotesque forms. The group in which these are most remarkable, is one which avoids the light of day even more than others; the animals composing it exist almost constantly in the darkest recesses of caverns; and it is probable that, by this peculiar conformation, they gain increased power and delicacy of the sense of smell, which in part compensates for the inutility of the organs of vision.

The families composing this order may be arranged under two principal divisions, which are strongly connected with each other in regard to the nature of their food, the conformation of their teeth and digestive system, and the peculiarities of structure which are connected with the mode in which food is obtained. One of these groups, which may be regarded as typical of the order, is insectivorous; the molar teeth are furnished with pointed tubercles, as in the order Insectivora; and the stomach and digestive system are evidently adapted to animal food. The other group is probably omnivorous, like many of the monkeys—feeding chiefly on fruits, but pursuing small birds, or large insects, that may be obtained without much difficulty; their molar teeth have flattened crowns, adapted for bruising and grinding their food; and the complex structure of the stomach and intestinal canal shows its adaptation to a vegetable diet. The proportional length of the intestine, in specimens of these two groups, is a remarkable illustration of this difference of adaptation. In the great bat of this country, belonging to the former group, it is only twice the length of the body; while in the frugivorous *pteropus* of the tropics, it is seven times.

The insectivorous group may be distributed into four families:—1. Rhinolophinæ: in these, the nose-leaf is of complicated structure, and is membranaceous; the index or forefinger has but one joint; the wings are

large and broad. 2. PHYLLOSTOMINÆ, which have the nasal appendage simple and fleshy, and an index-finger of two joints. 3. VESPERTILIONIDÆ, which are destitute of nasal appendages, and have a single joint in the fore-finger. 4. NOCTILIONINÆ, which are also destitute of nasal appendages, but have two joints in the index-finger.

1. To the first of these families, the RHINOLOPHINÆ, belong the greater and lesser *horse-shoe bats*, which are found in the darkest and most secluded retreats of Great Britain; their name is derived from the peculiar form of the anterior nasal appendage. The family contains many other genera and species, most of which are inhabitants of the Old World.

2. To the second family, the PHYLLOSTOMINÆ, belongs the celebrated *vampire*,-of the blood-thirsty propensities of which such marvellous stories have been told. The wound inflicted by its teeth is very small; but its tongue is endowed with a peculiar power of suction, by which a considerable amount of blood may perhaps be drawn. There are no well-authenticated accounts of the death of any animal having been occasioned by this creature; and the story of its fanning its victim with its wings to keep him cool, and render his sleep more profound, is probably a fiction of the imagination. Some of these bats have the tail very short, and in others it is altogether absent. They appear to feed in part upon succulent fruits; but there is one genus, the extreme shortness of whose intestine indicates that it must derive its food from animal matter almost exclusively. One of these has been taken in the act of sucking blood from the neck of a horse. The vampires are confined to South America; but other members of this family inhabit the eastern hemisphere. Many of them attain considerable dimensions; the body being equal in size to that of a magpie, and the wings, when expanded, measuring between two and three feet across.

3. The third family, VESPERTILIONIDÆ, is by far the most numerous, and includes most of the bats of temperate climates. At least thirteen species exist in this

Long-eared Bat.

country, the largest of which is the mouse-coloured bat, the expansion of whose wings measures fifteen inches; but this is of rare occurrence. A more common one is the noctule, or great bat, which is but little smaller; this is often met with in considerable numbers, seeking its retreat sometimes in the hollows of trees, at others under the roofs and eaves of houses. Probably the most abundant is the long-eared bat, which is easily distinguished by the character implied in its name. Its ears are folded downwards during hybernation or profound sleep. It is easily tamed when in confinement, and may be brought to considerable familiarity, so as to eat from the hand. It has an acute and shrill but not loud cry.

4. The bats of the fourth family, NOCTILIONINÆ, are almost exclusively confined to tropical countries. The number of species belonging to this group is very large, but few of them present any important peculiarities.

5. The frugivorous or omnivorous group contains but one family, the PTEROPINÆ. This is widely diffused throughout warm climates, and contains some of the largest species of the order. It is not improbable that the fabulous harpy may have had its origin in some of these. None of them have the tail much developed, and in many it is entirely absent. The *pteropus Javanicus* is a very characteristic example of this family. It is probably the largest of the bats—its expanded wings measuring five feet across. It is extremely abundant in the lower parts of Java, and uniformly lives in societies. They suspend themselves from trees during the day; and, from their motionless aspect and contracted bodies, they might be mistaken for parts of the tree, or for fruit suspended from its branches. When night comes, they begin to move, and go in search of food to the forests, villages, and plantations, in all of which they do great mischief, attacking indiscriminately almost any kind of fruit, of which they devour a large quantity. In their turn, they are eaten by the human inhabitants of some of the countries where they abound, who consider them as delicacies. The flesh of the common roussette of the Mauritius has been compared to that of the hare and partridge.

The Cheiroptera, inhabiting temperate climates, all remain in a torpid state during the winter. Some of them make their appearance, however, in mild days; but as casual revivals during the season of repose are injurious to them, they usually betake themselves to places of which the temperature is not readily affected by external vicissitudes. The office of this group in the economy of nature, is evidently to assist birds in restraining the too rapid multiplication of insects, and to keep down the luxuriance of tropical vegetation.

Order IV.—Insectivora.

The order Insectivora forms a group which is intermediate between the Cheiroptera and the Carnivora. Like the greater part of the first-named of these orders, the animals composing it are formed to live upon insect food; their molar teeth are beset with pointed conical tubercles, adapted to crush the hard envelopes of their prey; and they are, for the most part, like the bats, nocturnal animals—like them, too, passing the winter of temperate climates in a state of torpidity. But they are completely destitute of the wing-like expansions which enable those animals to rise into the air in search of their prey; it is *their* function to seek it upon the ground, or even by burrowing beneath it. Hence, in their general organization, they more resemble the Carnivora; but they retain the clavicle (collar-bone) of the higher orders, which in the Carnivora is reduced to a ligament, and this affords, in the burrowing species, a very important attachment to the powerful muscles by which their anterior members are put in action.

The teeth in this order are extremely variable, and cannot be so safely followed as guides to classification as the general structure and habits. All the animals belonging to it possess the peculiar conformation of the molars already described; the front molar, however, is usually of a form adapted for cutting, like those of the Carnivora; but posterior to this, there are generally three with conical tubercles. The disposition of the incisors and canines is very variable; in some species they are long, and in others short, and the forms of all the teeth are often so much changed that it is difficult to assign them to their respective classes.

This order may be divided into four families, which are characterized by their habits as well as by their external form and internal structure. 1. TALPIDÆ, or *Mole* tribe. These are pre-eminently subterranean, and are distinguished by their extraordinary habits of for

long and complicated burrows under ground, passing their whole lives in these retreats, in which they are born, feed, breed, hybernate, and die. 2. Soricidæ, or *Shrews*. These are a sort of carnivorous mice, which, though they do not actually burrow, retreat during the winter, and in their ordinary repose into holes; they feed, however, on the surface or in the water, several of them being partially aquatic, diving with facility after aquatic insects, and remaining without difficulty a long time under water. 3. Erinaceadæ, or *Hedgehogs*. Here we have still hybernating animals, but instead of burrowing or descending into deep excavations, they conceal themselves at or near the surface, where they find their food. The hair is converted into spines of considerable firmness. 4. Tupaiadæ, consisting of a single genus, the *Tupaia*. These partake of the character of the Insectivorous Quadrumana, living in trees, which they climb with the agility of a monkey or a squirrel.

It is remarkable that, as far as yet known, no species of this order exist in South America or Australia. In the former continent their place seems to be supplied by the Edentata, of which many species are similar in their food and habits; and in New Holland they are replaced by numerous small Marsupialia, having the same general adaptation of their structure to insect food and to an underground residence.

1. Of the Talpidæ, the common English *mole* is a very characteristic example. The whole structure of this animal is beautifully adapted to the subterranean life which it leads, and to the mode in which it seeks its food. A very short arm, attached to a large shoulder-blade, supported by a stout clavicle, and provided with enormous muscles, sustains an extremely large hand, the palm of which is always directed either outwards or backwards. The hand comes to a sharp edge below, and though the fingers are scarcely perceptible, the nails which terminate them are long, flat, strong, and sharp. This forms a most admirable spade, by which the earth is at the same time dug away and thrown behind the animal. The sternum (breast-bone) possesses, in common with that of bats and birds, a ridge or keel, for the attachment of the large pectoral muscles which are necessary to endow the anterior member with the required power. To pierce and raise up the ground, the animal employs its pointed head, of which the muzzle is greatly prolonged, and terminated by a little bone which serves as a borer. This prolonged snout is also used as an organ of prehension, for by it the food is seized and conveyed to the mouth. The hinder part of the body is feeble, and the animal advances above ground so awkwardly as to convey the impression of pain; but when placed in its gallery, or in a tube of the same size, it pushes itself forwards by its hind feet with great activity. The arrangement of the hairs composing the fur is such, that they will lie smooth in any direction; by which provision, the surface is prevented from offering any impediment to the motion of the animal either forwards or backwards.

The mole has been supposed to be deficient in the sense of sight, the eyes being so small, and so hidden behind the hair, that their existence was long denied; it has been ascertained, however, to be tolerably sharp-sighted. (There is a species inhabiting the south of Europe, very closely resembling the common mole, which is certainly blind; the eyelids of which are totally closed.) The sense of smell is extremely acute, and its organ largely developed; it is probable that to this almost entirely the mole is ordinarily indebted for the perception of its food, of its enemies, and of its mate. At the same time it appears to be assisted by that of hearing, which is certainly acute, although aided by no external ear. The burrows of the mole are of a beautifully complicated construction, and are formed with the utmost art. Its food chiefly consists of earth-worms and the larvæ of beetles. When hungry, however, it will attack mice, lizards, frogs, or small birds, that may fall in its way; and it is said that if two moles are confined together, they will fight until one is vanquished, and that the victor will then devour his fellow. Besides these forms of animal matter, vegetable substances, especially the roots of plants and the smaller roots of trees, are found in the stomach of the mole; but it may be doubted whether it eats these as food, or whether it does not simply tear them for the purpose of extracting the larvæ and worms which may be entwined among them.

Much controversy has taken place as to whether moles are on the whole injurious or beneficial to the agriculturist; some parties maintaining that they injure crops of various kinds by the destruction of their roots, and dig up and scatter the plants in ploughing their superficial furrows, besides rendering the ground dry and sterile by their subterranean roads; whilst others point to their destruction of earth-worms and grubs, and to the lightening of the soil produced by their operations, in proof of their beneficial character. The truth probably lies between the two extremes; the animal being neither prejudicial nor useful to the extent attributed to it by its enemies and friends respectively; but pretty certainly counterbalancing its mischief by the good it effects.

2. In the Soricidæ, or *Shrews*, all the feet are formed for running. These animals are usually small, but are very numerous and widely diffused. The fur is short, soft, and silky, and the tail long; so that the common shrew bears a strong general resemblance to a mouse, except that the snout is long and slender. The general habits of this family have already been mentioned.

3. The Erinaceadæ, *Urchins* or *Hedgehogs*, are remarkable not only for their covering of spines, but for the great development of the muscular envelope of the body immediately beneath the skin (especially on the back), which in most other animals is scarcely perceptible. By this they are enabled to roll themselves into a ball, presenting a panoply of sharp spines to their enemies. These are not only strong enough to resist attacks, but are sufficiently elastic to enable the animal to throw itself down upon them from considerable heights. So that, although destitute of all means of attacking its enemies or of defending itself by force, and not able to seek safety in flight, the hedgehog is endowed with a safeguard more secure and effectual than the teeth and claws of the wild-cat or the fleetness of the hare. In its natural state the hedgehog is nocturnal, remaining coiled up in its retreat by day, and moving about all night in search of food. Its run is quick and shuffling, and as it were by starts. Insects, worms, slugs, and snails, form the usual food of the hedgehog, but it will also devour frogs, toads, mice, and even snakes; and has been known to feed on eggs and vegetable substances. It is easily rendered familiar with man and with other animals. Other species of this family connect it with the previous and succeeding groups, the spines not differing so much in size and strength from hares, and the power of rolling up the body being absent.

4. The last family, that of Tupaiadæ, or *Banxrings*, is a very remarkable one. It is confined to the Indian archipelago, and has not been long known to exist. Their teeth chiefly resemble those of the urchins, with a slight tendency towards the lemurs; and, like this last group, their eyes are large and prominent. They are covered with hair, which is soft and glistening, but not fine in texture, and have a long bushy tail. Contrary to the habits of other Insectivora, they ascend trees with the agility of a squirrel; from which animal, however, their pointed muzzle renders them easily distinguishable, even at a distance. They are readily tamed

running freely through the house, and coming of themselves at every meal for fruit or milk.

Order V.—Carnivora.

The animals composing the order Carnivora are, like the four previous orders, separated from the other Mammalia possessing distinct fingers by the presence of three kinds of teeth; and from those orders they are distinguished by characters which point them out as especially formed for the pursuit and destruction of large animals. They possess in the upper and lower jaw six incisor teeth; a large, strong, and pointed canine tooth on each side; and molar teeth, which are evidently formed for cutting and tearing rather than for bruising or grinding. The form of these teeth varies, however, in the different genera, in accordance with their several habits. These molars consist of three kinds: the anterior, immediately following the canines, which are always more or less pointed, and are termed *false molars;* the next class, formed especially for cutting the flesh upon which the animals feed, are termed *carnivorous teeth;* and the posterior are tuberculated, with flattened summits.

The proportion which these different classes bear to each other in number and development, accords with the degree of the carnivorous propensity of the animal, and furnishes important characters in the subdivision of the order. The more the surface of the molar teeth is raised into points and edges, and the more the action of the jaws is restricted to the scissors-like movement by which these edges are made to meet and pass each other, the more purely carnivorous is the regimen of the animal: this is well seen in the Cat tribe. On the other hand, the more the molar surfaces are flattened, and the greater the lateral grinding motion of which the jaws are susceptible, the greater is the probable admixture of vegetable food: this is seen in the bears. The general structure of the body, and especially that of the extremities, is modified in a corresponding manner, in accordance with the habits and propensities of the animal. In all, the toes are furnished with claws, which are peculiarly sharp in the cats, and are in them kept ready for use within a sheath, from which they can be projected at the will of the animal. The stomach of the Carnivora is very simple in its form, and the intestines are short, in accordance with the easily digested character of their food.

The whole bony and muscular system exhibits a similar modification. Thus, whilst the powerful yet active and flexible movements of the purely carnivorous animals are adapted only to the pursuit and destruction of living prey, the more sluggish habits of most of the Bear tribe, their peculiar mode of progression, and the modified structure of the skull, the teeth, and the limbs, are all equally applicable to the mixed nature of their food. The difference in the conformation of the extremities, and in the mode of using them, is very striking in these two antagonized groups. In the former, the ends of the toes only touch the ground, the heel being considerably raised into the air; in this way, the limbs can be used to much greater advantage in running and springing: the animals possessing this conformation are termed *digitigrade* Carnivora. In the latter, the whole foot rests on the ground—a structure more favourable to the maintenance of a firm position, but preventing great activity of progression: these are called *plantigrade* Carnivora. There is a third very remarkable variety of conformation in the extremities of this order; and this is exhibited in the Seals. Here the anterior as well as the posterior feet are formed for swimming, being spread into fin-like paddles; and the whole arrangement of their organs is admirably adapted to the pursuit and capture of their scaly prey.

The Carnivora may be subdivided into five families each containing a well-known form. 1. Felidæ, or *Cat* tribe. In these the destructive power is most highly developed. They are characterized by their short powerful jaws, their retractile claws, and the peculiar adaptation of their teeth for cutting. They have but one small flattened molar tooth above, and no corresponding one below. 2. Canidæ, or *Dog* tribe. These, like the cats, are digitigrade; but their claws are not retractile; and they have two flat tuberculated molars behind the great flesh-cutter. 3. Mustelidæ, or *Weasel* tribe. These are mostly semi-plantigrade, a portion of the sole touching the ground. They are distinguished by their long narrow bodies, and by the presence of only one tuberculated molar. 4. Ursidæ, or *Bear* tribe. These are the only true plantigrade Carnivora. Most of them possess several tuberculous teeth. 5. Phocinæ, or *Seal* tribe. These are at once distinguished by the adaptation of their form and structure to a residence in the water; and of their teeth for holding the slippery surface of fish, and crushing them before they are swallowed.

1. The *Cat* tribe includes a large number of animals very closely resembling each other in structure and aspect—so closely, indeed, that many of the species can only be distinguished by their size, and by the markings of their skin. They all agree, too, in the mode of catching their prey, which is to steal upon it unawares, and seize it with a sudden spring, in which they expend their energy, often slinking off when once baffled. It is very difficult to subdivide the family, on account of the strong general resemblance of its members. Most of them are sufficiently well known to render any peculiar description of them unnecessary. It may, however, be remarked, that some species are found in almost all tropical and temperate countries, and that those of different parts of the globe *represent* each other in a remarkable manner. Thus, the *lion* and *tiger* are inhabitants of Africa and tropical Asia; in America they are replaced by the *puma* and *jaguar*, which are confined to that continent. In the same manner, we find the *panther* and *leopard* spread over tropical Asia and Africa; the *ounce* inhabiting the Asiatic mountains; the *caracal* in Turkey and Persia, and the *lynx* of Northern Europe. These are represented by the *ocelot* in South America, the *lynx* of Canada (differing from the European species), and other less known species. The Felidæ, like the noble falcons, will only eat the flesh of animals they have themselves killed, except when in a state of domestication or confinement, or when compelled by hunger.

Lion.

2. The family of Canidæ includes a much larger number of different forms, some of which approximate to the Cat tribe, and others to the weasels and bears. This tendency to variation from a typical form is most remarkably shown in the races of the common dog, which are believed to have all had the same origin, although the commencement of most of them is entirely unknown. The animals of this family agree in their greater or less adaptation to a mixed diet. Although animal flesh naturally constitutes the principal food of all, they do not attack living animals with a degree of boldness proportional to their strength, and many of them feed upon carrion, sometimes even when it is much putrefied. The *wolves*, *foxes*, and *jackals*, are the animals which most nearly approach the dog; and with the first of these it is regarded by many naturalists as being really identical.

The *Hyænas* constitute a group remarkably distinct from the true Canidæ, and yet bearing enough of their

characters to require to be associated with them. They are more purely carnivorous than the dog tribe, and approach in the deficiency of tuberculated molars to the cats. But they differ from these, not only in general aspect, which is much more nearly allied to that of the dog, but also in the absence of the retractile power of the claws, and in their propensity to feed on carrion. The teeth are peculiarly adapted for crushing bones, and their jaws are shorter than those of the dog, but longer than those of the Felidæ. In many other points of structure, the hyænas are intermediate between the two groups. They are peculiarly ferocious animals, combining the persevering *doggedness* of the one tribe with the furious bloodthirstiness of the other. Their habits are nocturnal—more so than those of most other Carnivora. Hyænas are now chiefly confined to Africa and the south of Asia; but there is no doubt, from the abundant remains of them which are preserved to us, that they must have formerly lived in large numbers in this country, and in other parts of Europe. With the Hyænas may be associated the *Civets*; and the *ichneumon* of Egypt, which restrains the multiplication of crocodiles by feeding on their eggs.

3. The Mustelidæ are the most *bloodthirsty* of all the Carnivora; but they are not so much adapted for devouring *flesh* as are the Felidæ. These animals, on account of the length of the body and the shortness of the limbs, which permit them to pass through very small openings, are called *vermiform*. All the members of this family are semi-plantigrade; and they thus conduct us to the truly plantigrade Carnivora. The *weasel* of this country is a very characteristic example of the family; it is one of the most sanguinary of any, but confines itself chiefly to small animals, destroying large numbers of mice, rats, moles, &c. The *ferret*, which is an allied species, is bolder, having been known to attack man; and the *polecat* is a great enemy to the farm-yard, game-preserve, and warren. All these animals have a strongly and disagreeably odorous exudation from a pouch under the tail; but it is most disgusting in the last. The *Otters* constitute an aquatic form of this family, having the same general aspect and dentition with the weasels, but being readily distinguished from all other genera of the family by their webbed toes and horizontally flattened tail. They subsist on fish.

4. The true plantigrade Carnivora, constituting the family of Ursidæ, participate in the comparative slow motion and nocturnal life of the Insectivora; and like them, too, the species which inhabit cold countries pass the winter in a dormant state. In the *Bears*, the cartilage of the nose is elongated and movable, somewhat resembling that of the Shrews. These animals possess a great facility, from the structure of the sole, of rearing themselves up on their hind feet; and this may be especially noticed in such as are, like the bears, fruit-eaters, becoming carnivorous only from necessity; they are thus enabled to climb trees in search of food. The bears are the largest of the family; and some species of them are pretty widely diffused over the globe. The *raccoons*, which resemble bears in miniature, with the exception of the greater length of the tail, are confined to the new world.

The *Badgers*, *Taxels* or Badgers of America, and the *Wolverines*, form a tribe connecting the Bears with the Mustelidæ. The *badger*, for example, is only semi-plantigrade, and has a dentition very like that of the weasels and otters, but adapted for a less carnivorous regimen. But it has the tardy gait and nocturnal habits of the other plantigrades; it does not, however, become torpid in winter. All these animals, like the weasel tribe, have the power of emitting a fetid odour at will.

5. The last family, that of Phocidæ (the Amphibia of Cuvier), is sufficiently distinguished from all the rest by the peculiar adaptation of the animals composing it to a marine residence. Their feet are so short, and so enveloped in the skin, that they are of little use in progression on land. In fact, the seal employs them only when clambering, wriggling itself forward along a plane surface by the action of the abdominal muscles. The intervals between the toes are occupied by membranes, so as to convert the feet into oars. The body is lengthened, and the spine very flexible, as in the Cetacea and Fishes; and the animals are covered with a short close fur, sitting flat upon the skin. All these adaptations combine to render them able swimmers; and they pass the greatest part of their time in the water, which they only quit to bask in the sunshine and to suckle their young.

Of the two genera, the *Seal* and the *Morse*, which this family contains, the former presents the least departure from the general type of the order, being adapted, as to its teeth and digestive organs, for animal diet; the latter group is chiefly herbivorous.

Order VI.—Cetacea.

In the order Cetacea, or *Whale* tribe, the adaptation of the mammiferous structure to the life of a fish is most remarkably displayed. The whole body is formed for an exclusive residence in the water. The posterior extremities are no longer present, as in the seal, to assist in progression on land; nor are the toes of the anterior furnished with claws. The trunk is prolonged into a thick tail, which terminates in a horizontal cartilaginous fin, by the vertical movement of which the propulsion of the body is effected. The head is very large, and is connected with the body (as in fishes) by so short and thick a neck, that no diminution of its circumference is perceptible; and the cervical vertebræ, which are still (as in all Mammalia) seven in number, are very thin, and partly united together. The bones of the arm and fore-arm are very short; and those of the hand are flattened, and enveloped in a tendinous membrane, which reduces them to the condition of fins. Hence their whole aspect is that of fishes, except that they are not covered with scales, and that they have the tail-fin expanded in the contrary direction. The object of this last provision is to enable them more readily to come to the surface to breathe, which they are obliged frequently to do. The largest species can remain, however, for an hour under water. Their blood, like that of other Mammalia, is warm; and to prevent the animal temperature from being rapidly lowered by the conducting power of the water, they are furnished with a thick coating of fat over the whole body. There are never any external ears, nor hairs upon the body. In these general characters, some other whale-like animals, now separated from the true Cetacea, agree; but they differ in being adapted for vegetable food, while the true whales are all animal-feeders, and are, therefore, properly associated with the Carnivora, to which they make a near approach through the seal. It is evident that the want of claws should not exclude them from this division of the Mammalia, since these are rendered useless by the adaptation of the animal to an exclusively aquatic residence. Some of them, which feed upon large marine animals, seize their prey with their jaws, whilst others, which derive their support from the smaller kinds, engulf them, with a large quantity of water, in their capacious mouths.

The true Cetacea are further distinguished from those herbivorous forms which are now associated with the Pachydermata, by the remarkable conformation from which they receive the name of *Blowers*. As with their prey they necessarily take in a great volume of water, a means of getting rid of this is required, and it is accordingly transmitted through the nostrils, and expelled by a strong muscular action through a narrow aperture pierced at the summit of the head. It is thus that these animals produce the jets by which they are observed

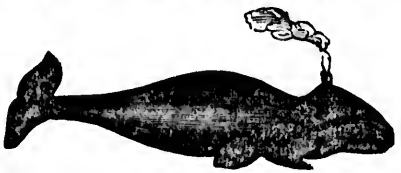
at a great distance. Their nostrils, being continually bathed in water, are not adapted to a delicate perception of odours; and their organs of hearing, being deficient in the external ear, and otherwise formed on a lower type, are also probably incapable of very acute perception of sound. But what is deficient in these respects seems to be compensated by a very high degree of sensibility of the general surface; and there is reason to believe that, by this diffused sense, whales are enabled to take cognizance of what passes in the water at a considerable distance, through the medium of the vibrations excited in the fluid.

In subdividing this order, the *dentition* does not afford much assistance, for the teeth are frequently absent altogether; and among the species which possess them, they often exhibit great differences, when the animals are closely allied. Where they exist, they are mostly small, numerous, and of a conical form, similar to each other. These animals do not chew their food, but swallow it whole. The stomach is usually of a rather complex form. The order may be divided into two families, according to the relative size of the head and body. In the first, DELPHINIDÆ, or the *Dolphin* tribe, the head is not out of the usual proportion; in the second, the BALENIDÆ, or *Whale* tribe, it is immoderately large.

1. The DELPHINIDÆ have teeth throughout both jaws, all simple, and nearly always conical. They are the most carnivorous, and, in proportion to their size, the most cruel of their order. The common *dolphin* has its snout prolonged into a kind of beak. It is extremely agile in its movements; and a number are often seen sporting together on the surface of the water. Nearly allied to the dolphin is the *porpoise*, which has a short muzzle. This is one of the smallest of the Cetacea, not exceeding four or five feet in length, and is very common in various parts of the Atlantic, assembling in vast herds. Allied to the porpoise is the *grampus*, which has large conical teeth, and is the most powerful of this family, attaining the length of from twenty to twenty-five feet. It is a cruel enemy to the whale, which it attacks in troops. Other species of this family are known on our coasts by the names of *white whale*, *bottle-nose*, *narwhal* or *sea-unicorn*, &c. This last animal is remarkable for the enormous development of a single tooth or tusk, commonly reputed to be a horn, whence the name commonly given to the species. In the general form of the head and body it agrees closely with the porpoises; but it possesses no other teeth than this tusk, which projects forwards, apparently from the centre of the upper jaw, to the length of ten feet. The animal really possesses, however, the germs of two tusks, of which only one is generally developed. That on the left side usually attains its full growth, while the other remains permanently concealed within its socket.

2. The remaining Cetacea, constituting the family BALENIDÆ, have the head so very large as to constitute one-third, or even one-half, of the entire length; but neither the cranium nor the brain participate in this disproportion, which is entirely due to an enormous development of the bones of the face. This family contains several remarkable and important animals, among which the following may be noticed:—The *catodon*, or spermaceti whale, receives its technical name from possessing teeth in the lower jaw only; these are of considerable size, and lock into cavities in the upper jaw when the mouth is closed. The superior portion of the enormous head consists almost entirely of large cavities, separated and covered by cartilages, and filled with an oil that concretes in cooling, and is known by the name of spermaceti. This is commonly, but erroneously, reputed to be the brain of the animal; the cavities which contain it, however, are very distinct from the true cranial cavity, which is rather small, and lies at the posterior portion of the head. Cavities containing spermaceti are found in various parts of the body, even ramifying through the external fat or blubber, and these communicate with those in the head. This whale is extensively distributed through various seas, but chiefly abounds towards the antarctic region. It sometimes attains the length of seventy feet.

The *balæna*, or Greenland whale, equals the catodon in size and in the proportional length of the head, which is not, however, so much enlarged in front. Instead of teeth, the mouth is provided with a number of vertical plates, terminating in fringes, which are composed of a sort of fibrous horn, and may be regarded as a kind of prolongation of the gum. These fringed plates, commonly known as whalebone, serve to retain, by straining from the water, the minute animals on which these enormous beings subsist. Their food consists partly of fishes, but chiefly of soft mollusca, acalephæ, &c. The blubber is of immense thickness, and furnishes a large quantity of oil—a hundred and twenty tons being sometimes obtained from a single individual. The whalebone also is an important object of pursuit. This animal was formerly not very uncommon in our seas, but has now retired to the far north, where its number, in consequence of the attacks of man, is constantly diminishing. The *rorqual*, an allied species, attains to still greater size, having been seen of the length of a hundred feet.



Whale.

Order VII.—Rodentia.

The order Rodentia bears a striking contrast to the last in the size as well as habits of the animals composing it, which are, for the most part, very diminutive, but they are very widely diffused, and are often extremely numerous. One species or another is found in every part of the world except New Holland, and sometimes their numbers are so great as to render them very destructive to vegetation. Some of the order are the most gentle of the Mammalia, while others are so ferocious that, if their size and strength were proportional, they would be extremely formidable. This order contains also some of the species most remarkable for their instincts, as the beaver. Generally speaking, the Rodentia are the most prolific of the Mammalia, the period during which they go with young being shorter, and their litters more numerous.

But though the animals differ much from one another in size and external appearance, the order is a very natural one; all the species contained in it being remarkable for the peculiar adaptation of their teeth to gnawing hard vegetable substances, and of the stomach and intestinal canal to the digestion of them. The mouth of a rodent animal is at once recognised by the two long teeth which project forwards from each jaw, working against one another, and separated from the molars by a wide interval. These are usually regarded as incisors; but they are really the canines, the direction of which has changed in consequence of the absence of the incisors. In the hare, the small true incisor teeth may be seen behind them. These gnawing teeth have enamel in front only; so that, their posterior edges being worn away faster than the anterior, they constantly retain a sloping or chisel-like edge. They continue to grow at the root as fast as they wear away at their points; so that, if either be lost or broken, its antagonist in the other jaw, having nothing to wear it down, becomes developed to an enor

mous extent. The mode in which the lower jaw is articulated to the skull, allows of no horizontal motion except backwards and forwards; and the flat-crowned molar teeth have enamelled ridges arranged transversely, so as to be in opposition to the horizontal movement of the jaw, and the better to assist in trituration. In a few of the genera, the structure of the molars more approaches that of the Carnivora.

The form of the body of the Rodentia is generally such that the hinder parts exceed those of the front, so that they leap rather than run. In some of them this disproportion is as excessive as in the kangaroos. The inferiority of these animals to those of the orders already considered, is perceptible in many details of their organization; the brain is less complex in structure; the forearm loses the power of rotation, its two bones being often united; and the eyes are directed sideways, showing their tendency to retreat from their enemies rather than to pursue them. In some the clavicles (collar-bones) are nearly or entirely absent; the anterior extremity being then usually deficient in strength.

The Rodentia may be divided into seven families, the technical distinctions between which are founded upon minute particulars in the structure of the cranium and of the lower jaw. 1. Sciuridæ, or *Squirrel* tribe, comprehending a large number of light and agile animals, chiefly distinguished by their long bushy tails, and by their adaptation to a residence in trees, and to live upon their produce. 2. Muridæ, or *Rat* tribe. 3. Castoridæ, or *Beaver* tribe, including the voles, lemmings, &c. 4. Hystricidæ, or *Porcupine* tribe. 5. Caviidæ, or *guinea-pig* tribe. 6. Chinchillidæ, the *Chinchilla* tribe. 7. Leporidæ, the *Hare* tribe. The rodents of the fourth, fifth, and seventh families are destitute of the clavicle, which those of the three first and the sixth possess.

1. Of the family Sciuridæ, the common *squirrel* of this country may be taken as a characteristic illustration; and its form and habits are sufficiently well known to render particular description unnecessary. It lives entirely upon vegetable food, in search of which it leaps with great agility from branch to branch. In taking these leaps, when it is once thrown off by an effort of its long and powerful hind legs, it is in a measure sustained by the horizontal spreading of its limbs and bushy tail, the hairs of which are directed laterally, so as to resemble a feather. In the *pteromys*, or flying-squirrel, this sustaining power is much increased by an extension of the skin of the flank between the fore and hind legs, which serves as a parachute. The *marmots* are allied to the squirrels in the number and structure of their teeth, which are partly adapted, however, to insect food. In other respects they are almost the reverse of squirrels, being heavy, with short limbs and a moderate-sized tail, and living on the ground, or even in burrows beneath it. More allied to the squirrels in the size of their tail and active habits, but differing in their dentition, are the *Dormice*, the structure of whose teeth shows them to approximate with the next family. They chiefly subsist on vegetable food; but some species of them attack small birds. All the members of this family pass the winter in cold climates in a state of lethargy, which is most profound in the marmots and dormice.

2. The family of Muridæ contains the smallest and at the same time the most numerous of the Mammalia. No undomesticated animals are better known than mice and rats. Of the common *mouse*, Cuvier thus concisely speaks—"known in all times and in all places." The house *rats*, abundant in this country, are almost as universally diffused; but the time of their introduction into many parts of the globe can be distinctly traced. The *brown* (commonly, but erroneously, called the Norway) *rat* made its first appearance in Paris about the middle of the eighteenth century, and in England not many years earlier; it is believed to have originally come from Persia. The brown rat is now speedily replacing the *black* or *old English rat*, which is becoming rather a rare animal in England, and which, from its smaller size, is an unequal match for the usurper. There is reason to believe, however, that even this is not a native of England, and that it was introduced from France about the middle of the sixteenth century. From Europe these two rats (which infest vessels equally with houses) have been sent to America, the islands of the Pacific, and many other places, in some of which they have now become a serious inconvenience. The only strictly indigenous British species of Muridæ are the *harvest-mouse*, and *long-tailed field-mouse*, both of them very beautiful little animals, and very interesting to the naturalist, although highly injurious to the agriculturist. A great number of species exist in various parts of the world, which do not differ widely from each other.

3. Of the Castoridæ, the *beaver* is probably the type; but this family contains many genera having a close resemblance to the rats. The beaver is distinguished from all other rodents by its horizontally flattened tail, which is of a nearly oval form, and covered with scales. The hind feet are webbed, by means of which and the tail, these animals obtain considerable swimming powers. They chiefly subsist on bark and other hard substances, and can fell trees of considerable size, of which they use the bark and twigs as food, employing the stems in the construction of their remarkable habitations. The flattened tail is employed by them as a kind of trowel, with which they plaster the walls of their houses. The beavers are connected with the previous family by the *Arvicolæ*, or *Voles*, many of which bear a strong general resemblance to rats, but differ in their dentition. Most of them are in some degree aquatic in their habits; such is the common *water-rat* of this country, the food of which, like that of the beaver, is (contrary to the general opinion) almost exclusively herbivorous. To this group also belong the *lemmings* or Scandinavian rats, which are remarkable for their occasional migrations in immense bodies. They are stated to advance in a straight line, regardless of rivers and mountains; and while no insurmountable obstacle impedes their progress, they devastate the country through which they pass. Most of this family lay up a winter store of food, upon which they subsist in the intervals of sleep, and do not go abroad during that season.

4. The animals which are characteristic forms of the family Hystricidæ are recognised at the first glance by the stiff and pointed quills with which they are armed, somewhat similar to those of the hedgehogs, but usually much larger. Besides the *Porcupines* and their allies, however, to which this description more particularly applies, this family contains several forms which connect it with the two preceding. The name porcupine is corrupted from the French *porc-epin*, a term expressive of the pig-like aspect and grunting voice of these animals, as well as of their spiny covering. They live in burrows, and have very much the habits of rabbits. The best known species inhabits the south of Italy, Sicily, and Spain. It is nearly the largest of the Rodentia, measuring almost three feet in length. There is an American genus nearly allied to the true porcupine, which has a long prehensive tail, like that of the opossums, and lives in trees.

5. The next family, that of Caviidæ, contains the largest-sized animals of this order, although, when compared with ordinary quadrupeds, they would be termed small. They are naturally restricted to tropical America, where they replace the hares and rabbits of cold climates. But the *guinea pig* is now extremely common in Europe, and is quite domesticated. The *capybara* is an inhabitant of the sides of nearly all the great rivers of South America, and is the largest known animal of the order

being about three feet in length, and of the size of the Siamese pig. It has a large thick and blunt muzzle, is destitute even of the rudiments of a tail, and is scarcely covered with bristly hairs. Its semi-aquatic habits are

The Capybara.

shown by the webbing of the feet. By this structure it can both swim and dive with much activity. Upon land it makes but little progress, running badly, and generally diving in the water to avoid danger. It lives in small societies, and seems to be a nocturnal feeder. Another of the Caviidæ is the *agouti*, which is an inhabitant of the Antilles and tropical America. It is about the same size as the European hare; but, in regard to its food, and its manner of feeding, it rather resembles the squirrel, preferring nuts to herbage, and sitting upon its haunches while eating.

6. The animals of the small family Chinchillidæ were until recently known only by their skins, which constitute an important article of commerce. In their general organization they seem intermediate between the cavies and rabbits, but differ from both of them in possessing clavicles. They are all natives of South America, chiefly inhabiting the range of the Andes, and they live socially, in extensive burrows.

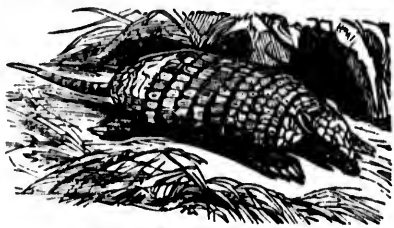
7. The Leporidæ constitute the last family of the Rodentia, and are distinguished from the rest by the presence of two small incisors behind the rodent teeth. The form and habits of the typical genus, *Lepus*, are sufficiently well known in the *hare* and *rabbit* of this country. A large number of species exist in the different parts of the northern hemisphere, and some are inhabitants of the Arctic regions. There is one species in England, in which the brown fur, that forms its summer coat, changes to white at the approach of winter. The hare is a ruminating animal, though without the peculiarly complex stomach of the Ruminantia.

Order VIII.—Edentata.

The animals composing the order Edentata cannot be described by any general positive characters which separate them from other groups; for there is a considerable dissimilarity in the entire structure and habits of the different species. The chief point of agreement among them is a negative one—the absence of incisor teeth, and the termination of the extremities in long claws. These claws are usually four in number, and partially embrace the extremities of the bones from which they are prolonged, so that each forms a kind of pointed hoof; and we have thus an approximation towards the unguiculated division of the Mammalia. The order may be separated into two distinct groups; one consisting of the Edentata-proper, and containing the Ant-eaters, Armadillos, &c., all of which are insectivorous; the other, denominated Tardigrada, from the slowness of movement of the animals composing it, and containing the Sloths.

1. The true Edentata are distinguished, like other insectivorous Mammalia, by their pointed muzzle. This is particularly remarkable in the *Ant-eaters*, which are peculiar to the warm and temperate regions of South America. They are destitute of any teeth; but possess a very long thread-like tongue, which they insinuate into ant-hills and the nests of the termites (or white ants), whence these insects are withdrawn by being entangled in the viscid saliva that covers it. Their fore-nails, strong and trenchant, enable them to tear open these nests, and also furnish them with an effective means of defence.

Most of the other true Edentata are burrowing animals, and are covered with a dense armour, composed of hard scales arranged in a *tesselated* manner, or fitted together like stones in a pavement. Between the different bands of these, there are narrow rings of membrane, which allow the body to bend. They have claws adapted for digging, seven or eight cylindrical molars on each side, and a tongue but little extensible. Of these animals the *Armadillos* are the chief, and are the forms best known. They subsist partly on vegetables and partly on insects and carcasses. Some of them appear to prefer putrefying animal matter; and many are nocturnal feeders.



Poyou, or Six-banded Armadillo.

2. The animals belonging to the family Tardigrada are at once known from the true Edentata by the peculiar shortness of the muzzle. The name of the family is derived from that commonly applied to the animals composing it. In the *Sloths*, according to Cuvier, "nature seems to have amused herself with producing something imperfect and grotesque." And if we consider the peculiarities of their organization in reference to the ordinary habits of mammiferous animals, this appears to be true. Both the fore and hind legs, by their form and proportions, and the manner in which they are joined to the body, are quite incapacitated from acting in a perpendicular direction, and of supporting the body from below; so that, when the animal is placed on the floor, his belly touches the ground. Moreover, he has no soles to his feet, and his claws are very sharp, long, and curved backwards; so that he has no firm support, and can only move forwards by laying hold of some fixed object, and dragging himself on by his hooked claws. But when placed on a branch, his aspect is altogether different. In the wild state, the sloth passes his whole life on trees, and never leaves them but through force or accident, or to pass from one to the other, which, in the densely tangled forests of South America, where alone it exists, is not frequently necessary. But, though appointed to spend its whole life in trees, it is not adapted to live *on* the branches, like the squirrel or monkey, but *under* them. It moves suspended from them; it eats suspended from them; it sleeps suspended from them. And, when its structure is considered in its adaptation to this extraordinary position, it is seen to be most admirably devised to meet the wants of the animal. The muscular system seems capable of prolonged action without effort; and this may perhaps be aided by the peculiar disposition of the arteries already noticed as possessed by the lori. The sloth remains upon a tree until it has stripped it of every leaf, and then it proceeds to another. It has been observed that, in the more open places, where the trees are

less contiguous, the sloths take advantage of windy weather to effect their transits, when the boughs are blown together and commingled. The peculiar conformation of these animals ought, therefore, no more to excite our pity and compassion, than the circumstance of fishes being destitute of legs. Their elevated habitation removes them out of the reach of the carnivorous animals, by which the race might otherwise be extirpated.

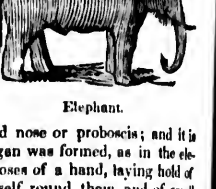
There have been found in South America—the country to which the existing Edentata are almost confined—remains of some enormous extinct animals, belonging evidently to the same group. Of one of these, the *megatherium*, nearly the whole skeleton has now been studied, by comparing different imperfect specimens; and there can be little doubt that it belonged to a gigantic animal intermediate between the sloths and ant-eaters. Its haunches must have been more than five feet wide; and its body fourteen feet long and eight high. Its feet were a yard long, and terminated by gigantic claws. Its whole structure seems to have been adapted to digging the earth in search of the succulent roots which probably constituted great part of its food. Another extinct animal of the same description is known by little else than its claws, and fragments of bones and teeth. From the form of the claw, the *megalonyx* (as it has been named) was at first supposed to be a carnivorous animal; but Cuvier satisfactorily proved it to belong to the Edentata. It seems nearly allied to the megatherium. Remains of tesselated bony armour have also been found, which indicate the former existence of a large animal allied to the Armadillos, to which the name *glyptodon* has been given; and other remains of gigantic ant-eaters have lately been discovered in the same locality.

The Edentata terminate the series of the *unguiculated* or *clawed* true Mammalia; and, as has been just seen, there are some among them with the claws so large, and so enveloping the ends of the toes, and these reduced to so small a number, as to approximate to the nature of hoofs. Nevertheless, they have still the faculty of bending their toes round various objects, and of grasping with greater or less force. The entire absence of this faculty characterizes the *hoofed* animals. They use their feet only as supports, and the fore-arm has not the power of rotation, its two bones being frequently consolidated into one, or one of them greatly enlarged at the expense of the other, like those of the leg of man and of most Vertebrata. The hoofed animals in no instance possess clavicles, and they are entirely vegetable feeders. Their forms and mode of life present, therefore, much less variety than is found in the unguiculated animals, and they can hardly be divided into more than two orders—those which ruminate and those which do not. The former constitute a very natural and easily circumscribed group, the animals which compose it bearing a strong general resemblance to each other, and being easily distinguished from other groups. The latter contains a number of different forms, the connection of which with one another by any very important peculiarities common to all is not very obvious. On account of the general thickness of their skins, they are called PACHYDERMATA.

Order IX.—Pachydermata.

The order Pachydermata, consisting of hoofed animals which do not ruminate, may be divided into three groups, each of which shows a tendency towards some other order. The first of these, PROBOSCIDEA, containing only the *elephant* and its extinct congeners, approaches in several particulars to the Rodentia. In both we find two large front teeth developed at the expense of the rest, and the grinders are formed of parallel plates of enamel and bony matter. There are also many points of resemblance in the form of the bones, and more particularly in those of the extremities. For the elephant has not a complete hoof, but five toes to each foot, which are very distinct in the skeleton; but being enveloped in a callous skin, which surrounds them all, the only external indication of their separate condition is in the nails at their extremities. The second group, that of TRUE PACHYDERMATA, contains those which have four, three, or two toes to their feet. Those in which the toes make even numbers, as the SUIDÆ, or *Pig* kind, have feet somewhat cleft, and approximate to the Ruminantia in various parts of the skeleton, and even in the complication of the stomach. Of the others, which have not cloven feet, some approach the Proboscidea, with which they are connected by forms now extinct, but of which the bony remains are sufficient to determine their character. The third group of Pachydermata, the SOLIDUNGULA, consists of quadrupeds with only one apparent toe, and a single hoof to each foot, as in the *horse*. These also, in their general form and manner of life, approach the Ruminantia, with which they are particularly connected by the camel and an animal now extinct. Another group should also probably be associated with this order, holding the same rank in it as the Amphibia or Seal tribe among the Carnivora. This is the small family of aquatic herbivorous animals, termed MANATIDÆ, which were placed by Cuvier among the Cetacea, but which differ from the true whales in several important particulars, and are found to be closely connected with the hippopotamus by links now extinct.

1. The first group, PROBOSCIDEA, contains only one living genus, the *elephant*, of which the *mammoth*, which has become extinct within a comparatively recent period, is an allied species.



Elephant.

Another extinct animal of this group is the *mastodon*, which, in the conformation of its teeth, appears to have some affinity with the hippopotamus. All these animals agreed in possessing a pair of enormous tusks or front teeth, and a very elongated nose or proboscis; and it is probable that this last organ was formed, as in the elephant, to answer the purposes of a hand, laying hold of large objects by coiling itself round them, and of small by means of the finger-like organ at its extremity. The magnitude of the sockets necessary to hold the tusks, renders the upper jaw so high, that the nostrils, which are prolonged through the trunk, are placed in the skeleton near the top of the face. By means of its trunk, the elephant not only lays hold of its food, but sucks up its drink, which it makes to fill its capacious nostrils, and then discharges, by bending its trunk, into its mouth. By this admirable organ, the shortness of the neck, rendered necessary by the weight of the head, is fully compensated. The cavity for the brain by no means corresponds with the external form of the skull; for, in order, as it would seem, to give a larger surface for the attachment of the muscles of the trunk, the outer layer of bone is widely separated from the inner, and between the two are a number of large bony cells.

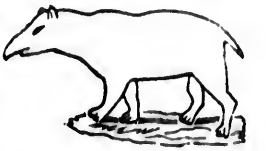
In none of the Proboscidea has the lower jaw of the adult any front teeth. The arrangement of the grinders differs in the various species; but in all they are composed of alternating plates of hard *enamel* and softer *bony* matter, cemented together by a third substance, which is termed the *cortical*. These grinders are in constant progress of renewal; but they succeed each other, not by rising from below upwards, as in man, but by being pushed forwards from behind, in proportion as the tooth before each is worn away. There is never more than one *perfect* molar on each side; but in proportion to the age of the animal there may be two, three, four, or more of the front ones being the worn-down remains of

those at first formed. It is stated that the molars are thus renewed eight times. The tusks, however, are only changed once; but, like the cutting teeth of the Rodents, they are constantly being renewed at the roots. Two species of elephants exist at the present day, both of which inhabit tropical climates, one in Asia the other in Africa. Remains of the mammoth are chiefly found in the north of America and of Siberia; and, from a nearly perfect specimen, which was discovered frozen in the ice near the mouth of the River Lena, it appears that this species was adapted to live in cold climates—the skin being densely covered with hair of two kinds. The habits of the elephant are sufficiently well known to render it unnecessary here to dwell on them. Its food is entirely vegetable; and, in its undomesticated state, it consists chiefly of the leaves and young branches of trees, and of the long herbage of the ground, both of which it gathers with its trunk. The tusks serve not only as weapons of offence and defence, but to root up small trees and tear down cross branches, either to obtain their leaves, or to make a passage for the bulky body of the animal through the tangled forest.

2. Of the true Pachydermata the first family is that of SUIDÆ, the *Pig* kind. It is characterized by the peculiar thickness of the skin, and by the presence of four toes on each foot. They have three sorts of teeth in each jaw; the canines are usually long, and project forward as tusks; the anterior molars are more or less narrow and conical, whilst the posterior are tuberculated. The food is principally vegetable, but admits of considerable variation. The domesticated pig is well known to be quite an omnivorous animal. In the true pigs, the foot has two toes furnished with large hoofs, and two much shorter ones that scarcely touch the ground. The *wild-boar*, which abounds in some parts of the continent of Europe, is well known to be a very ferocious animal; and the domesticated race which is derived from it often exhibits indications of the same character. One of the most curious animals of this tribe is the *babyroussa*, a native of the Indian archipelago; the upper canines of which are very long, and grow spirally upwards and backwards. These serve as defensive weapons of a very powerful description, inflicting severe lacerations by an upward stroke of the head.

With the family of Suidæ is probably to be placed the *hippopotamus*, or river-horse, which seems in many respects intermediate between the pig and the elephant; whilst its aquatic habits, and the conformation by which it is adapted to these, approximate it to the Dugongs. Only one species is known, which is now confined to the rivers of middle and south Africa. But for its short, thick, and very blunt muzzle, it might be compared to a gigantic pig; the body is extremely massive, and the legs so short that the belly almost touches the ground; and it is destitute of any covering but a few weak and scattered bristles. The canine teeth are long; the upper ones straight, and the lower curved backwards, so that they rub against each other. Although ferocious, or rather courageous, when attacked, these unwieldy inhabitants of the waters are in their nature shy, and feed entirely on roots and other vegetables, seeming to prefer those which are partially decomposed by the action of the water.

3. The second family of true Pachydermata, to which the name of TAPIRIDÆ, or the *Tapir* tribe, may be given, resembles the first in the thickness of its skin, but differs in the arrangement of the toes, of which there are only three on each hind foot, and sometimes also in front, without any central cleft. There is considerable variation in regard to the teeth; but the whole family is exclusively herbivorous. No members of it exist in Europe at the present time; but fossil remains of very large species are abundant in some localities. The *tapir* of America is about the size of a small ass, with a brown and almost naked skin, a short tail, and fleshy neck that forms a crest at the nape. It is common in humid places and along the rivers, and its flesh is eaten. The nose assumes the form of a short fleshy trunk—the rudiment, as it were, of that of the elephant. Other species have been recently discovered of a larger size; one of which has the bones of the nose still more elongated, approaching a very remarkable fossil genus, the *palæotherium*. This seems to have been an animal nearly allied to the Tapirs; remains of several species, varying in size from a rhinoceros to a small sheep, have been found in the gypsum quarries of Paris, the fresh-water deposits of the Isle of Wight, and other places.



Form of Palæotherium.

To this family belongs the *rhinoceros*, which is remarkable for its large size, and for the kind of horn, composed of a solid fibrous substance, resembling agglutinated hairs, which is supported on an arch formed by the nasal bones. Several species exist in different parts of the tropical portion of the Old World. They are naturally stupid and ferocious, frequenting marshy places, and subsisting on herbage and the branches of trees. In some species a second horn exists behind the first. The upper lip is generally elongated, and has some power of prehension. Rhinoceros' bones have been disinterred in many parts of Europe.

4. The third group of Pachydermata, the SOLIDUNGULA, contains only one family, that of the EQUIDÆ, or *Horse* tribe. Though there is only one apparent toe and single hoof to each foot, there are appendages beneath the skin which represent two lateral toes. The well-known animals of this tribe, the *horse*, *ass*, *zebra*, *quagga*, *onagga*, and *dzegguetai*, are commonly regarded as belonging to but one genus; but the first of these is probably to be separated from the rest, from the circumstance of its tail being wholly clothed with long hair, whilst that of the rest has long hair only towards the tip. On this point, however, there is much uncertainty, arising from our ignorance as to the original stock of the horse. In all the instances in which we at present know horses to exist in a wild state, the race appears to have been originally derived from a domesticated stock. This is certainly the case with regard to the wild horses which now spread over the plains of South America, all of which are descended from those first introduced there by the Spaniards.

All the animals just named agree in their dentition. There are six incisors to each jaw, which, during youth, have their crowns furrowed by a groove, and six molars on each side, above and below, with square crowns, marked, by plates of enamel which penetrate them, with four crescents. The males have, in addition, two small canines in their upper jaw, and sometimes in both; these are always wanting in the females. Between the canines and the first molar there is a wide space, which corresponds with the angle of the lips, where the *bit* is placed, by which alone man has been enabled to subdue these powerful quadrupeds. None of the species of this family are indigenous to America.

5. The animals associated in the family *Manatidæ*, may be considered as Pachydermata still more adapted than the hippopotamus to an aquatic residence. In their teeth and general organization they bear a close correspondence to this order; and the fish-like form which they exhibit is scarcely a greater variation than is seen in the order Carnivora. The posterior extremities of

these animals are entirely wanting, as in the true Cetacea. The type of this family is the *manati*, which grows to the length of fifteen feet, and frequents the mouths of the African and American rivers. It is called sea-cow, and its flesh is eaten.

Order X.—Ruminantia.

The order Ruminantia is perhaps the most natural and best determined of the whole class, for all the species which compose it seem constructed, as it were, upon the same model, the camels alone presenting any considerable exceptions to the general characters of the group. The first of these characters is the entire absence of incisor teeth from the upper jaw; whilst the lower appears to possess eight; of these, however, the two outer ones are really canines which have taken the form of incisors, so that the number of the true incisors is six, as in the other viviparous Mammalia. The molars are almost always six in number, both above and below, and have their crowns marked with two double crescentic ridges of enamel, which aid in triturating the food. The feet are each terminated by two toes and two hoofs, which present a flat surface to each other, appearing as though a single hoof had been cleft; hence the names that have been applied to these animals, of cloven-footed, &c. Behind the hoof there are always two small spurs, which are the vestiges of lateral toes.

The name of the order intimates the singular faculty possessed by these animals, of masticating their food a second time, or "chewing the cud." This faculty depends on the structure of their stomachs, which are four in number. The food which is cropped by the incisor teeth is swallowed almost without mastication, and is moistened in the stomach: and, after being compressed into little pellets or *cuds*, is returned to the mouth to be rechewed while the animal is at rest. When this operation has been performed, the food is transmitted to the true digestive stomach.* This remarkable provision has a very interesting adaptation to the general structure and characters of these animals. The Ruminantia, taken as a group, are timid, and destitute of powerful means of defence against their foes. They rather seek their safety in flight when attacked. Their food, consisting chiefly of the grasses of various kinds, requires to be thoroughly masticated before it can be properly digested. When feeding on the pastures they frequent, they are liable to many alarms; and if they were compelled to spend a considerable time in masticating their food before swallowing it, they would often be in danger of starvation, by being obliged to leave their pasture before their wants were supplied. But by their power of subsequent rumination, they are enabled to dispense almost entirely with the first mastication, and to feed with comparative quickness. They convey a store of food into the first stomach or paunch, as the monkey into its cheek-pouches; and then, retiring to a secure place, they prepare it for digestion at their leisure.

The whole structure of these animals corresponds with the account just given of their habits. Their legs are long in proportion to their body, and the spinal column is very flexible; both which conditions are favourable to great activity of motion. They are endowed with a very acute sense of smell, which seems to be their guide in the selection of their food. Their ears are placed far back, and are very movable; and these are well adapted to catch sounds from behind, so as to warn the animals of danger while feeding. The eyes are placed at the sides of the head, and the pupil is in the form of a horizontal oblong; so that the range of vision along the surface of the earth is very great, and the animals can easily look behind them when pursued. Their means of defence consist in the use of their horns to gore the enemy, and of their hind feet to kick it; but it is only when peculiarly courageous that single animals of this species will act on the offensive, or stand on the defensive, against others of proportional size and strength.

The Ruminants, of all animals, are those which are most useful to man. They supply him with a large proportion of his animal food. Some serve him as beasts of burden; others furnish him with their milk, their tallow, leather, horns, and other useful products.

The great resemblance which exists among the very numerous members of this order, renders the distribution of them into families, each characterized by some important peculiarity, a matter of some difficulty. These subdivisions are, probably, best erected upon the character of the horns, which are possessed by the males of all the species in their natural state, excepting such as (like the camel) connect this order with other groups. The horns are essentially bony prominences from the fore part of the skull. In some Ruminants, commonly termed *cattle*, such as oxen, sheep, goats, and antelopes, these prominences are covered with an elastic sheath, formed as it were of agglutinated hair, which continues to increase by layers during life. It is to the substance of this sheath that the name of *horn* is commonly applied, while the bony support is termed the *core*; this grows during life, and never falls. In the *giraffe*, again, the bony prominences are covered with a hairy skin, which is continuous with that of the head; and here, too, the bony part of the horn is permanent. But in the *deer*, these prominences, which are covered for a while with a hairy skin (commonly termed the *velvet*), like the other parts of the head, have at their base a ring of bony tubercles, which periodically enlarge, and compress the nutritive vessels of the horns. These accordingly die, and fall from the skull; and the animal remains defenceless. Others, however, are reproduced, generally larger than before, which are destined to undergo the same fate. These horns, periodically renewed, are usually styled *antlers*.

The Ruminants with horny sheaths to the bony prominences, may be divided into three families. Antelopidæ, or *Antelope* tribe, characterized by the lightness of their forms and the activity of their movements, and by the solidity of the bony core. Caprinæ, or *Goat* tribe: in these the bony core is partly occupied with cells, and the general form approaches that of the Ox tribe; but the horns are directed upwards and backwards. Bovidæ, or *Ox* tribe: these have the horns directed upwards and forwards; the form is robust, and the movements heavy. The division of the Ruminants in which the horns are periodically cast off, constitutes only one family, that of Cervidæ, the *Stag* tribe. Another family, including only the giraffes, and named Camelopardæ, is characterized by the shortness and permanence of the horns, which are covered with a skin. Of the Ruminants without horns there are two distinct families —the Moschidæ, or *Musk Deer*, which are remarkable for their elegance and lightness, and differ but little from the rest of the order save in the absence of horns; and the Camelidæ, or *Camel* tribe, which in their dentition and in the structure of the extremities, exhibit a transition to the Pachydermata.

1. The family Antelopidæ, remarkable for the slenderness of form and swiftness of foot of the animals composing it, contains above seventy well-ascertained species, bearing a strong general resemblance to each other. Most of these are natives of Africa; a few species, however, inhabit Asia; a still smaller number exist in America; and one only, the *chamois*, now remains in Europe. Among these numerous species we meet with forms that remind us of the other families o

* For a more particular description of this process, and the organization by which it is effected, see the article Animal Physiology

the Ruminantia—the ox, goat, stag, &c. They generally associate in large herds, which migrate together in search of pastures. A species well known to the colonists of South Africa is the *spring-bok*, which occasionally visit their cultivated lands, during seasons of drought, in innumerable herds, causing devastation wherever they pass. The antelopes may probably be regarded as the types of the Ruminantia, exhibiting the peculiar characters of the order in the most remarkable degree. They are extremely vigilant and timid: and the speed of the swiftest species surpasses that of every other mammiferous animal. Those which are adapted to live on rocks and mountains exhibit the most remarkable agility, and fearlessness of those dangers which their

Spring-bok Antelope.

habits would seem to involve; they walk with perfect composure along the giddy brinks of the most awful precipices, climb and descend with wonderful care and precision, and leap up or down to the smallest surface that will contain their collected feet, with perfect firmness; and yet they are so fearful of any supposed enemy, that it is difficult to get within gunshot of them.

2. The family of Capridæ is connected with the last by many antelopes which, like the chamois, approach the goats in form. It includes only the *goats* and *sheep*. The original stock of the domestic breeds of the former appears to be indigenous to Persia, where it inhabits the mountains in large troops. The goats of Angora, Thibet, &c., celebrated for the fine quality of their hair, are no more than varieties of the common species. The *ibex*, which inhabits the mountains of the old world, and especially the Caucasian chain, is distinguished by the size and strength of its horns. It is said that this animal fearlessly precipitates itself down precipices, always falling on its horns, the elasticity of which secures it from injury. The *sheep* appear to have extremely little real difference from the goats: a large number of races exist, the relation of which to each other is uncertain; and there is doubt as to the original stock of the whole. Of the domestication of this animal we have an earlier record than of any other.

3. The species of the family Bovidæ, or *Ox* tribe, are comparatively few. They are all large animals, with a broad muzzle, heavy and massive body, and stout limbs. Of the original stock of the domestic ox, we have no certainty, since, as in the case of horses, the existing races of wild-cattle are probably all descended from those which have been at some period subservient to man. Of all the animals which have been reduced to his service, the ox is, without exception, that to which he is most indebted, for the extent and variety of its means of usefulness. The universal utility of the animal appears to have been very soon detected; and we find, consequently, that its domestication soon followed that of sheep, and that it is mentioned in the most ancient records as a servant of man, long before either the horse or dog are noticed.

Among the undomesticated species of this family which have all a strong general resemblance to each other, and are the most powerful and savage animals of the whole order, may be noticed the European *bison*, which was formerly spread over Europe, but is now restricted to Lithuania and the Caucasian region; the American bison, commonly called *buffalo*, which inhabits all the temperate parts of North America; the *Indian buffalo*, of which there are several different races (in one, the horns include a space of ten feet from tip to tip), of which some have been domesticated; the *Cape*

Cape Buffalo.

buffalo, an extremely ferocious animal, with large horns, first directed downwards so as nearly to cover the forehead, inhabiting the woods of Caffraria; and the *musk-ox*, a species inhabiting the coldest regions of North America, with short legs, and long hair reaching the ground, which diffuses more strongly than the rest the musky odour common to the whole genus, and which is particularly noticeable in the European bison.

4. The family Cervidæ, or *Stag* tribe, includes, like that of antelopes, a large number of species differing but little among each other, very widely diffused over the earth's surface, and easily separated from others by the character of the horns. With the exception of the reindeer, however, the female is destitute of horns, save in a few rare individual cases, analogous to those in which the hen assumes the plumage of the cock bird. The substance of the horns, when completely developed, is that of a dense bone, without pores or internal cavity; their figure varies greatly according to the species, and even in the same individual at different ages. These animals are extremely fleet, and live mostly in forests, where they feed on grass, the leaves and buds of trees, &c.

5. Of the family Camelopardæ, only one species was for a long time known to exist; but there are probably two, or even three, kinds of giraffe, all of which are natives of Africa, frequenting chiefly the borders of the deserts. Its remarkable form, depending chiefly on the great length of its neck and fore legs, is familiar to every one. In its general structure, however, it closely resembles the deer; differing from them in the permanence of the horns. It has also some points of affinity to the camels; especially in the length of its neck, the existence of callosities, or hard surfaces, on the breast and knees, and the absence of the small spurious hoofs. It is the tallest of all animals; its head being frequently raised eighteen feet from the ground. Its disposition is gentle, and it feeds on leaves; browsing upon the young branches at a height much above that which any other animal can reach, and drawing them towards its mouth by its prehensile tongue. It lives in small troops of five or six individuals, and is very timid, although capable of powerfully defending itself by kicking. Not

withstanding the length of its neck, the number of vertebræ which this part contains is no greater than in other Mammalia.

6. The Moschidæ, or *Musk-deer*, are completely intermediate between the true *Deer* and the *Camel* tribe, which last connects the Ruminantia with the Pachydermata. They resemble the ordinary Ruminants in the lightness and elegance of their forms, and in the nimbleness of their movements; and differ chiefly in the absence of horns, and in the projection of the canine tooth on each side of the upper jaw, as in the camels. The name of this group has been derived from the common Musk, the males of which secrete the odoriferous substance so called. This species is almost without tail; and the hairs which completely cover it are so coarse and brittle that they might also be called spines. It is confined to the mountainous region between Siberia, China, and Thibet, from which most of the Asiatic rivers descend. Its habits are nocturnal and solitary, and its timidity extreme. The other musk-deer inhabit the warmer parts of Asia and the eastern archipelago; they have no musk-pouch. They are the smallest and most elegant of the Ruminantia, and are active and gentle in their habits.

7. The Camelidæ, or *Camel* tribe, approximate to the preceding order, and especially to the whole-hoofed division of it constituting the Horse tribe, more than do any other Ruminants—to such a degree indeed, that some naturalists prefer associating them with that group. They have always canines in both jaws, and two of the incisors have also the same pointed shape. The animals of this family are much less elegant in form and graceful in action than the other Ruminants; but their organization is, equally with theirs, most perfectly adapted to the circumstances in which they exist. The family contains two groups, the *Camels* and *Llamas;* the former are restricted to the Old World, and the latter correspond to them in the New.

In the true *Camels* the two toes are united below by a kind of horny sole, almost to their points, which terminate in small hoofs; and there is a soft cushion beneath the foot, by which it bears upon the sandy surface over which it is formed to move. Two species are known, one called the *Bactrian* or *two-humped camel*, and the other the *Arabian*, or *one-humped*. Both are completely domesticated. The first is employed chiefly in Central Asia, the latter in Arabia, North Africa, Syria, Persia, &c. The two-humped camel is the larger and stronger, being capable of sustaining above one thousand pounds' weight, and is best adapted for rugged ground; the other is the most abstemious, and the best

Dromedary.

fitted for the sandy desert. The *dromedary* is merely a lighter variety of it, possessed of greater fleetness and power of endurance. The flesh and milk of the camel serve as food, and the hair for the manufacture of cloth, to the people who possess it. Their humps, principally composed of fat, are provisions of super-abundant nutriment, which are gradually absorbed and disappear on the occasion of a scarcity of other food, as is observed at the end of a long journey. By resting on their callositics, they are enabled to repose on a scorching surface, and their stomachs are adapted to contain a supply of water sufficient for several days.

The *Llamas* of South America are much smaller than the preceding; they have the two toes quite separate, and are without humps. They were the only beasts of burden possessed by the Peruvians at the time of the conquest. They can only make short journeys, and the largest of the four species known cannot sustain more than one hundred and fifty pounds. Remains of a fossil species have been lately found, which must have equalled the camel in stature.

Order XI.—Marsupialia.

The two remaining orders of Mammalia, the Marsupialia and Monotremata, are now usually regarded as constituting a distinct sub-class, termed *Ovo-vivipara*, intermediate between the truly viviparous Mammalia and the oviparous Birds and Reptiles. Their most obvious peculiarity is the production of their young at a very early period of development, in a state incapable of motion, and barely exhibiting the rudiments of limbs; so that it is not until a long time after their birth that they acquire a condition parallel to that of a new-born animal of one of the higher orders, and they much more resemble the half-formed chick in an egg which has been but a few days incubated. In accordance with the lower grade of this important function, we find a general inferiority of the whole organization to that of the truly viviparous Mammalia, and approaches, in many points of structure, to birds and reptiles. The skeleton, the nervous system, the arrangement of the large blood-vessels, and the larger number of the incisor-teeth (which in the higher sub-class never exceed six), all show indications of this approximation; and this is also indicated in the deficiency of intelligence, which is manifest in their physiognomy as well as in their actions.

Of these two orders, that of Marsupialia is the one which exhibits the least departure from the general type of the Mammalia, and it is that, too, in which the provision for the continued nourishment of the young by its parent is the most remarkable. The new-born imperfect offspring attaches itself to the teats of the parent, in remains fixed there until it has acquired a degree of development comparable to that with which other animals are born. The skin of the abdomen of the parent is so disposed as to form a pouch in which these imperfect young are protected, and into which, long after they can walk, they retire for shelter on the apprehension of danger. It is from the pouch (*marsupium*) that the order takes its name, this being its distinguishing peculiarity. It is remarkable that, notwithstanding the general and usually very striking resemblance of the species to each other, they differ so much in the teeth, the digestive organs, and the feet, that, if we rigidly adhere to these characters, we should find it necessary to separate them into distinct orders.

The geographic range of this order is extremely peculiar. With the exception of the Opossum group, which inhabits America, its species are at present almost confined to Australia and the neighbouring countries, where they constitute, with the Monotremata, almost the only mammiferous animals.

The Marsupialia may be divided into families according to the nature of their food. Some of those inhabiting Australia are altogether carnivorous, and display considerable ferocity. The *Opossums* have a mixed diet; they are remarkable for possessing an opposable thumb, like that of Quadrumana. Another group is more formed to live in trees, where they feed upon insects and fruit; to this belongs the *petaurus*, or flying-opossum,

which is formed upon the same plan with the flying-lemur The Kangaroos, of which several species exist,

Great Kangaroo.

resemble the Ruminantia in food and habits. They are remarkable for the enormous length of their hinder feet, whence their generic name, *Macropus* (long-footed), is derived. The hind legs and tail are also very largely developed; while the fore legs and feet are very small. From this great inequality in the size of the limbs, they advance on all-fours very slowly; but they can make immense leaps with the hind legs, the tail probably assisting them. These are furnished with one large nail, almost like a hoof, which is a powerful weapon of offence and defence; for, supporting itself upon one leg and its tail, the animal can inflict a very severe blow with the leg which is at liberty. It will sometimes grasp its enemy with its fore paws, while it kicks it with its hind foot; but this it will only do when attacked, for it is naturally a very gentle animal. The largest species is sometimes six feet in height, having the bulk of a sheep, and weighing 140 pounds. Its flesh is used as food by the New Hollanders, and is described as being a little like venison.

Order XII.—Monotremata.

The order Monótremata is a very extraordinary one. It contains but two species, the *echidna* or spiny ant-eater, and the *ornithorhynchus* or duck-billed platypus; and these are found nowhere else than in New Holland and Van Diemen's Land. These were included by Cuvier (who regarded the absence of teeth as the chief character) among his Edentata; but zoologists have now generally agreed that the peculiarities of their structure and physiology fully entitle them to rank as a distinct order, even more dissimilar to the other Mammalia than are the marsupial quadrupeds just considered. Until recently, indeed, it was much doubted by many, whether they could be included among the class Mammalia at all, since their organization did not appear at all adapted for the nourishment of the young by suckling, which is the essential character of the group. The lips of both animals, in adult age, are of horny consistence, resembling the bills of birds; in the echidna they are prolonged into a narrow beak, and in the ornithorhynchus they form a wide flat bill like that of a duck. Moreover, the presence of glands for the secretion of milk appeared doubtful. But the late researches of Mr. Owen have shown that the lips, in the young state of these animals, are much softer and more flexible, and that mammary glands certainly exist; so that the question may now be regarded as decided.

The name and character of the order are derived from the fact of the excretory openings at the posterior part of the body being united into one, as in birds; and this is a point of very remarkable affinity with that class, which is borne out by their general organization. There is a sort of clavicle (collar-bone) common to both shoulders placed before the ordinary clavicle, and analagous to the *furcula* (merry-thought) of birds. Each foot possesses five claws; and, besides these, the males have a peculiar spur on the hinder ones, like that of a cock.

The *Echidna* is characterized by the slenderness of the prolonged muzzle or bill, which contains an extensible tongue, like that of the ant-eater. The feet are short, very robust, and adapted for digging. The whole upper part of the body is covered with spines, bearing some resemblance to those of the hedgehog; and when apprehensive of danger, and unable to escape from it by burrowing, the echidna can erect its spines, and roll itself into a ball.

The habits of the *Echidna* in a state of nature are but little known; for they do not exist in any large number, and they burrow so rapidly in the ground, that even when one is discovered it is not easily got hold of. To lift it from the ground, requires more force than would be supposed; for it firmly fixes itself to the earth in an instant, and but a few moments elapse before it is so far down, that its back is level with the surface. It feeds upon insects, principally ants, which it captures by its long extensile tongue; and this appears to be furnished with a glutinous secretion which causes them to adhere to it.

The *ornithorhyncus* (so named from its *bird*-like *bill*), is an animal of such extraordinary aspect, that the specimen first brought to this country, at the end of the last century, was supposed to have been *made up*, by the attachment of the beak and feet of a bird to the body of an otter-like quadruped. It was not until other specimens had arrived, and had been submitted to most careful examination, that naturalists were satisfied of the real existence of such an animal. Since that period, its true place in the scale, depending upon the mode in which it produces and nourishes its young, has been a most fertile source of controversy; but the question may now be regarded as set at rest by the inquiries of Mr. Owen, already alluded to.

The whole organization of this singular animal is evidently designed to adapt it for seeking its food in the water, and for chiefly inhabiting that element; and what is known of its habits fully confirms this view. It burrows in the banks of rivers, and seeks its food in precisely the same manner as the duck. River insects, small shellfish, and water-plants, appear to constitute its nourishment. The animal is very timorous, and, if alarmed while at the surface of the water, dives down head foremost, and does not ascend at the same spot.

CLASS II.—BIRDS

Birds have been denominated, and not inappropriately, the Insects of the vertebrated series. As in the animals of that class, we find the whole structure peculiarly adapted to motion, not in water, nor supported by solid ground, but in the elastic and yielding air. It is true that there are some birds whose wings are so slightly developed, as not to be able to lift them off the ground; and there are others whose natural element seems to be the water, through which they are more adapted to move than through the element above. But in looking at the general character of a group, the naturalist has to put out of view these exceptional cases, and to consider the structure and habits of the mass.

It is impossible to conceive of any more beautiful adaptation of structure to conditions of existence than that which is exhibited in the conformation of the bird with reference to its intended mode of life. To make a vertebrated animal capable of soaring through the air, sometimes moving with a swiftness which, in proportion

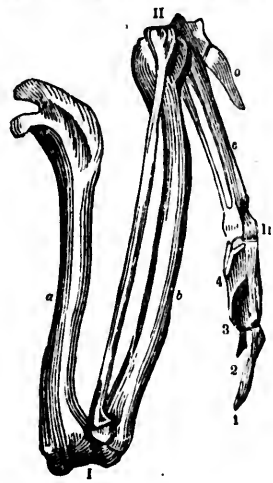
to its size, far surpasses that of any other beings but insects, and at others sustaining itself on the wing almost without motion for a considerable period, is a problem which human ingenuity, even with an unlimited command of materials and of power of construction, would almost certainly fail of solving—so many are the conditions necessary to be fulfilled, the slightest failure in any one of which would have marred the result. It is only after attentively studying the structure of these animals, as presented to our view by an all-wise Creator, that we become aware of the complex nature of these conditions, and of the variety of adaptations necessary to fulfil them.

In regard to the place of the class in the vertebrated series, this is easily determined to be between the Reptiles and Mammalia. Like the former, its members are oviparous, and, like the latter, they possess a complete double circulation and warm blood. In order to adapt the vertebrated animal to its aërial residence, it is obviously necessary that the body should be of as low specific gravity as possible, that is, should be as nearly as can be of the same weight with an equal bulk of air. It is further necessary that the surface should be capable of being greatly extended, and this by some kind of appendage that should be extremely light, and at the same time possessed of considerable resistance. The great degree of muscular power required for support and propulsion in the air involves the necessity of a very high amount of respiration, for which an express provision also exists in insects; and as the general activity of the vital processes depends greatly upon the high temperature which this energetic respiration keeps up, a provision is required for keeping in this heat, and not allowing it to be carried away by the atmosphere through which the bird is rapidly flying.

The first and third of these objects—the lightening of the body and the extension of the respiratory surface—are beautifully fulfilled in a mode which will be found to correspond with the plan adopted for the same purpose in insects. The air which enters the body is not restricted to a single pair of air-sacs, or lungs, placed near the throat, but is transmitted from the true lungs to a series of large air-cells disposed in the abdomen and in various other parts of the body. Even the interior of the bones is made subservient to the same purpose, being hollow and lined with a delicate membrane, on which the blood-vessels are minutely distributed. In this manner, the respiratory surface is immensely extended, and, by the large quantity of air introduced into the mass, its specific gravity is greatly diminished. There is another provision in the conformation of birds, having reference to the same objects. The ribs are connected to the breast-bone by bony instead of cartilaginous arches, and are fixed in such a manner, that a state of fullness is that which is natural to the chest and its contents, while that of emptiness is forced. And thus the body almost always contains as much air as its cavities can hold.

The other two objects—the extension of the surface and the retention of the heat within the body—are also accomplished in combination, by a most beautiful and refined contrivance, to which there is nothing parallel in the whole animal kingdom, namely, the covering of feathers. Like hair or scales, feathers are to be regarded as appendages of the cuticle or outer skin; and the apparatus by which they are formed does not differ in nature, although more complicated, from that which secretes hair. The feather consists chiefly of the *quill* and *vane*; by the former it is attached to the body, and the latter gives the expanded surface. The vane consists of a number of small *lamina*, or separate plates, which are formed between folds of membrane that serve as a kind of mould to them; and they are afterwards connected to the stem of the feather. When perfectly formed, they are connected by minute barbs at their edges, which hook into one another and thus give the necessary means of resistance to the air. The substance of which feathers are formed is a very bad conductor of heat; and when they are lying one over the other, small quantities of air are included, which still further obstruct, by their non-conducting power, its transmission. Thus the two chief objects are fulfilled—power of resistance and slow conducting properties being combined with lightness and elasticity.

The general adaptation of the bony frame-work to give effect to the purposes for which this remarkable covering is constructed, will next be considered. In



Jer Falcon's wing.

the accompanying wood-cut, I. represents the elbow-joint; II. wrist-joint; III. finger-joint; *a*, humerus or arm-bone; *b*, bones of fore-arm; *c*, bones of hand; 1, 2, 3, 4, rudiments of fingers; *o*, rudiment of thumb, or winglet. The feathers which form the wings are inserted into the skin covering the anterior extremities, which correspond to the arms of a man. In the bones of these may be recognised the chief parts which are elsewhere found; but those which form the hand, being only intended for support, and having no prehensile powers, are much consolidated together, but at the same time elongated. The quills adhering to the hand are called *primories*; from their greater distance from the centre of motion, they have the most powerful effect, and they are therefore constructed in the strongest manner; those attached to the fore-arm are called *secondaries*; and weaker feathers attached to the humerus are called *tertiaries*; while those that cover the shoulder are termed *scapulars*. These distinctions are very important in dividing the principal groups into subordinate sections.

The anterior extremities of birds being thus solely adapted to sustain them in flight, the posterior are necessarily modified for their support on the ground. These are usually placed rather far back, and the spine has a position more inclined than horizontal, so as to be balanced upon them. The trunk is supported on the thighs by very powerful muscles; and there is another series which pass from the lower part of the spine to the toes, turning over the knee and heel, in such a manner that the flexion of these joints shall shorten them: by this contrivance, the simple weight of the body flexes the toes, and birds are thus enabled to sleep perched on one foot. Most commonly the feet possesses four toes of which one is directed behind and three in front. This posterior toe opposed to the rest is not, however

analogous to the thumb of Quadrumana, which is only represented in birds by the spurs of the Fowl tribe. In some birds two of the toes are disposed behind, and two in front; in others the posterior toe is deficient; in others, again, it is brought forwards. The number of joints in the posterior toe is but two; in the external it is five.

The upper part of the skeleton of the trunk is peculiarly adapted to give power to the wings. The *sternum* or breastbone is made to project forwards with an elevated ridge or keel, to which the strong muscles which depress the wings are attached; and from the depth of this, the powers of flight may be in some degree judged of: in the ostrich tribe, where the wings are not sufficiently developed to raise the bird off the ground, it is quite flat. The shoulder-bones are connected with the sternum and with each other in a much stronger manner than in other vertebrata. The two *clavicles*, or collar-bones, are united together on the central line, forming the *furcula*, or merry-thought; and the use of this is to keep the shoulders apart, notwithstanding the opposing force exerted by the action of flying. It is generally

Sternal apparatus of the Common Hurrier;
a, furcula; *b*, keel of sternum.

firm, and its angle open, in proportion to the power of flight. Besides this, we find the sternum connected with the shoulder by two bones termed *coracoid*, which in man and the other Mammalia are scarcely developed, being merely short processes from the shoulder-blade, which do not reach the sternum.

In order to give as great firmness as possible to the centres of motion of the wings, the trunk of birds has but little flexibility; the vertebræ being firmly jointed to one another, and the ribs united to the sternum by bony prolongations of the latter, instead of by cartilages. But this want of flexibility of the trunk is counterbalanced by the length and flexibility of the neck. The number of cervical vertebræ (which in the longest-necked Mammalia is never more than seven) is very considerable, varying from twelve to twenty-three, the highest number being present in the Swan tribe. These are so jointed together that the head can be turned completely round (the position assumed when at rest) or moved in any direction. The jaws or mandibles of birds are not furnished with teeth; but are covered, like those of the Chelonia, with a horny envelope, which sometimes projects considerably beyond them, and forms the *bill*. This is occasionally furnished with little projections, which in some degree supply the place of teeth; but it is only in the birds of prey that these are supported by any corresponding projections of the bone beneath.

The reduction of the food is entirely performed in the stomach. The digestive process is extremely powerful in birds, and the demand for food very frequent. The gullet, before entering the stomach, is dilated into a large cavity, termed the *crop*, in which the food is stored up as in the cheek-pouches of monkeys, and from which it is transferred by little and little to the true stomach. This is composed of two parts, the *proventriculus*, or membraneous stomach, the walls of which are beset with glands; and from these a secretion is formed, by which the food is moistened. It is then transferred to the second division, termed the *gizzard*, which is furnished with thick fleshy walls; and by the muscular action of these it is ground down to a pulp. Gravel is swallowed by some birds, for the purpose of augmenting the triturating power of this organ. The gizzard is most powerful in birds which feed on grains, as the common fowl. In those which subsist on animal food, or on soft herbage, its muscles are reduced to extreme tenuity, so that it is scarcely distinguishable from the proventriculus. The dilatation of the craw is sometimes wanting. In parrots and pigeons it is an important organ in the nutrition of the young. It is furnished with numerous glands, which become developed in both sexes during the period that they alternately perform the duty of incubation; the function of these is to secrete a milky substance, with which a part of the food swallowed by the parent is impregnated, and this is then disgorged for the supply of the young.

The development of the senses of birds varies in different tribes according to the mode in which they are adapted to obtain their prey. The sight is almost always extremely acute, and is the chief means of seeking food. The powers of vision in the rapacious birds are probably the greatest. A hawk has been known to distinguish a lark, coloured like the clod of earth upon which it is sitting, at twenty times the distance at which it would be perceived either by a dog or man. The rapacious birds seem more remarkable, however, for their *length* of sight; those which, like the swallow, capture insect prey on the wing, must have a *quickness* of sight of which we can scarcely form a conception, since, while flying at the rate of three miles in a minute, they are constantly on the watch for their victims. The sense of smell does not seem to be in general highly developed in birds; even the vultures would seem to become cognisant of their food, at least as much by sight as by scent. The sense of hearing seems to be in general tolerably acute, especially in the nocturnal birds of prey, some of which possess—what the rest want—an external cartilaginous ear. The tongue of birds does not appear to serve as an organ of taste, except in a few species. It is employed in various ways as a means of obtaining food. The sense of touch appears to be generally very obtuse; but in such as the duck, which search for their food in mud, where neither sight nor smell can be of much avail, the bill is covered with a skin abundantly supplied with nerves of sensation, in order that the animal may feel about for its hidden sustenance.

Of all the endowments of this interesting class, none is more striking, or ministers more to the pleasure and delight of man, than their varied powers of *song*. It may safely be affirmed, that one, at least, of the reasons for which so much strength of voice has been given to the feathered creation is, that it may serve for mutual recognition and companionship, which would otherwise be difficult between individuals of so small a size, when separated by distance or intervening foliage; for this power has been bestowed upon the birds which make their habitation among trees, much more universally, and to a much greater extent, than upon any other part of the class. To this order of INSESSORES, or perching-birds, indeed, the *musical intonation* of the voice seems almost exclusively confined. The assertion that the song of birds is peculiarly an expression of love at the breeding season, is certainly erroneous; the use of the faculty is by no means confined to that season, and probably indicates general pleasure and contentment; the voice will consequently be most exercised at the time of

courtship, as well as during the period of incubation, when the male solaces the partner of his cares with his melody. For a combination of power, sweetness, variety, richness, and compass, the nightingale is generally regarded as entitled to the first place among singing-birds; but the vocal achievements of the mocking-bird, which can imitate "to the life" the song of every other bird, and the voice of almost every animal which it hears, while at the same time it possesses a rich and peculiar song of its own, are yet more extraordinary. Many birds which have no song, possess a remarkably expressive voice, obviously adapted to communicate their wants or desires; the common crow is an instance of this.

Not only do birds resemble insects in their general structure and mode of life, but also in the peculiar development of the instinctive powers. Under the direction of these, the place for their nests appears to be selected; their materials collected; the nests themselves built, and the young reared in them; the migrations are performed; and many curious stratagems are employed to obtain food. These it is sufficient thus to indicate in general terms; since it is well known that the habits of birds have something peculiar in each species, yet that in all the individuals of each species they are as precisely alike as their circumstances will admit. Nevertheless, there is observed in birds a degree and kind of adaptation to varying conditions, which insects do not possess, and which display an amount of *intelligence* superior to what is found in that class. And in the domesticability of many tribes of birds, we see an obvious approach towards that higher form of attachment to man, which is exhibited by many species among Mammalia.

There is a more striking conformity in the entire class of birds to one general type, than is probably seen in any other group of equal extent in the whole animal kingdom. The instances of any remarkable departure from it are very few; the chief is that exhibited in the Ostrich tribe, in which the development of the wings is very small. In no other instance are either of the extremities wanting; and thus birds never exhibit the irregularity occasionally presented by fishes, reptiles, and even Mammalia.

Owing to this general conformity of type, the subdivision of the class is a matter of some difficulty, since it is not easy to say what characters should be regarded as of most importance, and what are but secondary. And this difficulty extends also to the smaller subdivisions; in separating which, characters that appear very trivial are often necessarily employed from the want of others. The following orders may probably be regarded as constituting groups of species having a positive resemblance to each other, and a well-marked dissimilarity from the rest.

The Natatores, or Swimming-birds, are known by the union of the toes with a web, so that the surface by which the foot acts upon the water is greatly extended. The legs are short, and placed behind the point of equilibrium. The body is closely covered with feathers, and coated with a thick down next the skin. It is in this order that we find the nearest approach to reptiles which birds present.

The Grallatores, or Waders, are known by the length and slenderness of the legs, which are bare of feathers to a considerable height, by the elongation and straightness of the toes, the length of the neck and beak, the slenderness of the body, and the considerable development of the wings.

The Cursores, or Runners, were included in the last order by Cuvier, chiefly, it would seem, on account of the length of the legs. But these members, instead of being slender, are very strong, being the only locomotive organs; and the wings are very slightly developed, and not capable of raising the bird into the air. This last character is quite sufficient to separate the group from all others.

The Rasores, or Scratchers, receive their name from an action common to many of them, and particularly observable in our ordinary poultry. The character of the order is chiefly derived from the structure of the feet, which are furnished with three toes, united at their base by a short membrane, and with one behind, higher than the rest; and these are armed with short, blunt, and robust nails, for the purpose of scratching up their food.

In the first of these orders, the habitation is, more or less exclusively, aquatic; in the second, marshy places are chiefly frequented; and the third and fourth contain birds essentially adapted to live on the ground, and to seek their food without rising into the air. In the remaining orders, the habitation is more or less aërial.

The Scansores, or Climbers, pass most of their time in trees, clinging to the branches by means of their feet, which are specially adapted to that purpose. The external toe is turned backwards, as well as that which was posterior in the Rasores, so that they have two toes in front and two behind. This conformation prevents them from walking readily on the ground; and, their powers of flight not being usually great, they are not so active as the Insessores.

The Raptores, or Birds of Prey, constitute a group sufficiently well marked by the robustness and muscularity of the whole body, the strength of the legs, and of the bill and talons. The former is strong, curved, sharp-edged, and sharp-pointed; and all of the toes—three before and one behind—are armed with long, strong, and crooked claws.

There now remains a very extensive group of birds, presenting no very marked differences among its members, and not readily defined by any striking characters which separate it from the rest. Accordingly, it is usually made to constitute but one order, that of Insessores, or Perching-Birds. The principal character in which all these agree, is the slenderness and shortness of the legs; the feet have three toes in front and one behind, and the two outer ones are united by a very short membrane; they are all slender, flexible, and moderately long, with long and slightly curved claws. These feet are readily distinguishable from those of the other orders: they are destitute of the webbed expansion possessed by the Natatores; they have not the robust strength and destructive talons which characterize the Birds of Prey; nor do they present the very extended toes which enable the Waders to walk safely over marshy soils, and tread lightly on the floating leaves of aquatic plants. They are adapted to enable the bird to *rest* on the branches of trees, but not to *cling* to them; and, accordingly, the birds of this order pass a large proportion of their time on the wing.

Of all these orders, the Cursores present the nearest approach to the Mammalia in their conformation and mode of life; but it is among the Incessores that we find most developed those characters which have been mentioned as distinguishing the class—power of flight, beauty of plumage, and melody of voice. These, therefore, as the types of the class, will be first considered.

Order I.—Incessores.

This order, composed of the Perching-Birds, is the most numerous and varied of the whole class. Its character seems principally negative; for it embraces those birds which are neither swimmers, waders, climbers, rapacious, or gallinaceous. Nevertheless, by comparing the different tribes it includes, a great general resemblance of structure becomes apparent; and such insensible gradations are perceived between those that at first appear most unlike, that it is difficult to establish the subdivisions of the group. The foot, as the name denotes, is especially formed for grasping or perching—a peculiarly

evinced by the situation of the hinder toe, which is invariably placed on the same level or plane as those in front. The length of the tarsus or shank (that which appears the lowest division of the leg, but is really the higher part of the foot) is moderate, and often very short in comparison to what is seen in other orders; and, as these birds never seize their prey by their claws, these weapons are never retractile. The perchers are thus distinguished from the birds of prey properly so called; from the climbers they are separated by having three toes directed forwards; while the situation of the hind toe enables them to be readily known as neither gallinaceous, wading, nor swimming birds. Their food is various, but in general mixed, consisting of insects, fruit, and grain; those in which the beak is stout and strong feed more upon grain, some of them, however, even pursuing other birds; and those which have a very slender bill feed on insects, or on the juices of flowers. The proportional length of the wings and their powers of flight, are as various as their habits. In general the females are smaller and less brilliant in their plumage than the male; they always live in pairs, build in trees, and display the greatest art in the construction of their nests. The young come forth from the egg in a blind and naked state, and are wholly dependent for subsistence, during a certain period, upon parental care.

The *larynx*, or organ of voice, is always of complex structure in the members of this order, which contains all that are commonly known as singing-birds. There are few that do not either sing, or utter some peculiar note or chatter analogous to song, during the season of courtship; and even of those which in general utter only monotonous cries, or of which the notes are harsh, some are frequently capable of being taught to speak, to whistle airs, or to imitate other sounds.

The families composing this order may be distributed under four large groups or assemblages, characterized by the respective forms of their bills. The Conirostres have a stout beak, more or less conical, and with regular edges. The Dentirostres have the upper mandible notched, as in the Raptores, towards the point; but this notch only exists in the horny covering, and not in the bone. The Fissirostres have a short, broad, horizontally-depressed beak, so formed that the gape of the mouth is extremely wide; it is slightly hooked, but without any tooth at the edge. The Tenuirostres have the bill very slender and elongated; it is sometimes straight, and sometimes curved.

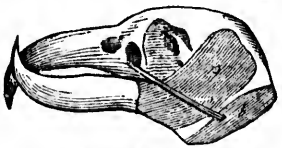
I. Conirostres.—The Conirostres are to be regarded as containing the types of the order, the species belonging to it having the most varied faculties. They feed indiscriminately upon insects and vegetables, and are therefore termed omnivorous. Their feet are so constructed that they can walk upon the ground with nearly the same facility as they perch upon branches. The families included in this tribe are the Corvidæ, or Crows; Sturnidæ, or Starlings; Fringillidæ, Finches; Bucerotidæ, Hornbills; and Loxiadæ, Crossbills.

Of the family Corvidæ, the common *Crows* are the most characteristic examples, and may be regarded as combining the general characters of the class in a greater degree than any other birds. In every climate habitable by man these birds are found; they are constructed for powerful and continued flight, as well as for walking firmly upon the earth; they feed indiscriminately on animals or vegetables, and, when pressed by hunger, do not refuse carrion: their smell is remarkably acute. They are bold but wary, live in common societies, and possess great courage; when domesticated, they possess a power of imitating the human voice nearly equal to that of the parrot; and, like it, show signs of greater intelligence than is found in the rest of the class. Under the general term *Crow* are included the raven, which is the largest of European perching-birds, and which is bold enough occasionally to carry off poultry; the corby crow, which is very destructive to eggs and young game; the rook, which chiefly feeds on insects, and especially devours the grubs of the Coleoptera, though it occasionally eats grain if its proper food be scarce; the hooded crow, which feeds upon molluscs, &c., on the sea-shore; and the jack daw, which is a very vigilant enemy of predatory birds. The *magpies* are nearly allied to the crows; as are also the *jays*, which live principally, however, in woods, and feed on acorns, &c. The Sturnidæ are best known by the European *starling*; the family seems like a smaller race of crows, which they greatly resemble in manners and structure, but are much weaker.

The Fringillidæ, or *Finches*, are the smallest of this group of perching-birds, and are readily known by the shortness and strength of their conical bills. They subsist generally on grain. The number of species is very great; and some among them are everywhere diffused. The sparrows, chaffinches, linnets, goldfinches, bullfinches, and larks, are the kinds best known in this country.

The Bucerotidæ, or *Hornbills*, are readily distinguished at first sight by the enormous size of their bills, which are swollen or enlarged at the base into protuberances resembling horns or knobs, which are sometimes as large as the beak itself. The form of this excrescence varies much with age; and in very young individuals there is no trace of it perceptible. It is not solid, except in one species, but composed of a fragile network of bony fibres. The use of this curious appendage is unknown. The Hornbills are gregarious noisy birds, of large size, and are peculiar to the Old World. They subsist on all sorts of food, devouring tender fruits, chasing mice, small birds, and reptiles, without disdaining carrion; and they breed in the hollows of lofty trees.

The family of Loxiadæ, or *Crossbill* tribe, contains a large number of genera, of which the common crossbill can scarcely be regarded as a characteristic illustration, the peculiarity from which it takes its name not being possessed by more than a few other species.



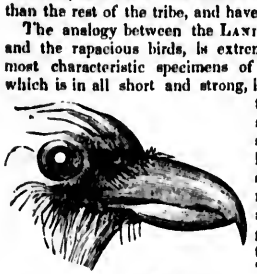
Bill of Crossbill: *a* and *b*, muscles which move it.

This peculiarity consists in the strong curvature of the mandibles, so that their tips pass each other; and not always on the same side; by this extraordinary bill the bird is enabled to extract the seeds from pine-cones with astonishing facility, and it is confined to localities in which these are to be obtained. The species common in Western Europe has of late years become more abundant than formerly in the British Isles, where it was previously chiefly known as an occasional straggler.

II. Dentirostres.—This group is the most allied of all the Incessores to the Birds of Prey. As its name imports, the species it includes are distinguished by a distinctly notched bill, and they are the greatest destroyers of insects among the Perchers. With very few exceptions, they either live entirely on insects, or resort to fruit only when insufficiently supplied with their favourite nourishment. The mouth is protected on each side by bristles, which defend the soft parts during the struggles of the prey; and the feet are generally adapted more for perching than for walking. The form of the beak varies in different species; in the shrikes, for example, it is stout and compressed, while it is flattened or depressed in the fly-catchers, which lead towards the Swallow tribe. This group includes the following families:—Laniadæ, or Shrikes, which most prominently manifest the peculiarities of the group. Merulidæ, or Thrushes, in which there is less restriction to peculiar kinds of food: Syl

VIADÆ, or Warblers, chiefly peculiar for the small size, delicate structure, and vocal powers, of the species it contains. AMPELIDÆ, or Chatterers, distinguished by the enormous width of their gape. MUSCICAPIDÆ, or Fly-Catchers, which are more exclusively confined to insects than the rest of the tribe, and have small and weak legs.

The analogy between the LANIADÆ, or *Shrike* tribe, and the rapacious birds, is extremely evident. In the most characteristic specimens of the family, the bill, which is in all short and strong, is abruptly hooked at the end, and the notch so deep as to form a small tooth more or less prominent on each side; by this conformation the bird is enabled to take a firm grasp of its food, and to tear it in pieces. The claws, also, are usually strong and sharp. Like many of the falcons, the shrikes will sit for hours watching for their prey, which consists of small birds, and, in the less powerful species, of insects; and will suddenly dart down upon such as come within their reach, seize it with their feet, and carry it home to be devoured at leisure. They not only pursue small birds, but successfully defend themselves against larger ones, even attacking them when they intrude in the vicinity of their nests. Many species feed also upon frogs and other small terrestrial animals. This family contains a large number of species, distributed through all quarters of the globe. They have the same general structure and habits, differing only in subordinate particulars. Some, which are superior in power of flight, pursue insects on the wing; others subsist entirely on soft caterpillars, which they search for among the foliage of high trees; and others prowl about among bushes and underwood, preying upon insects and young or sickly birds, and in the breeding season destroying great quantities of eggs.



Bill of Shrike.

The MERULIDÆ, or *Thrushes*, have an arched and narrow beak, but the point is not hooked, and the lateral tooth is not so marked as in the shrikes. Nevertheless, the transition from one form to the other is very gradual. This family is inferior to the shrikes, therefore, in the peculiar organization adapted to rapacious habits, but they possess a greater variety of powers. It is in this family that we find the birds most distinguished for the sweetness, compass, and versatility of their song. They are not confined to animal food, but live much on fruits and berries.

Of this family the common *thrush* (mavis or song-thrush), the *blackbird*, and *fieldfare*, are well known and also characteristic examples. These, as well as the *missel-thrush*, *redwing*, *ring-thrush*, &c., are closely allied species of the same genus, of which the other species are distributed over the whole globe. The *mocking-birds*, on the other hand, which probably stand unrivalled for their powers of voice, are restricted to America: some of them approximate to the shrikes in their habits. A few species of this family have somewhat aquatic habits.

The chief peculiarity which runs through the numerous family of SYLVIADÆ, or *Warblers*, is the very small size and delicate structure of the species which compose it. Excepting the Humming-Birds, we find among these elegant little creatures the smallest birds in creation. The diminutive golden crests, the nightingale, the white-throat, and the wood-wren, are examples of this family well known to the British naturalist; as are also the robins, stone-chats, wagtails, tit-larks, and tit-mice. Its different groups are spread over all the habitable regions of the globe, and appear to have a peculiar function in the economy of nature, being specially designed to keep down the multiplication of the innumerable minute insects which lurk within the buds, the foliage, or the flowers of plants. The small size of these insects causes them to escape the notice of the thrushes and the larger insectivorous birds; whilst their habits prevent them from being seized by the swallow and such as capture insects only on the wing. The Sylviadæ are for the most part migratory birds; appearing in spring, when the insect world is called into life and activity by the renewal of vegetation, and disappearing in the autumn, when their services are no longer required, and when their supply of food diminishes or ceases altogether.

Of the family of AMPELIDÆ, or *Chatterers*, the most characteristic examples belong to tropical America, and only one is found in Europe—the *wax-wing*. The birds of this family are distinguished from all the other Dentirostres by the enormous width of their gape, which in many extends beyond the eye, and in some is nearly as wide as in the goatsucker. This bill is not defended by bristles, however, at its corners; and the absence of these indicates that its wide opening is *not* for the purpose of catching insects on the wing, as in the swallow tribe. The chatterers live almost entirely on soft berries and small fruits, which they swallow whole; and this food naturally requires a very wide passage. They are perpetually hopping among fruit-bearing trees, and scarcely ever come to the ground. The species which may be regarded as the types of this family are very little known, being inhabitants of the deepest and most secluded forests of tropical America. They are oftener heard than seen; their notes being peculiarly loud, and uttered morning and evening from the deepest recesses of the forests. Many of them are clothed in a very rich and brilliant plumage, which rivals that of the humming-birds.

The MUSCICAPIDÆ, or *Fly-catchers*, are a family hardly less numerous than that of the warblers; and are composed, like that group, entirely of small birds. This family is more purely insectivorous than any other of the order, few of the species belonging to it ever partaking of fruits. These birds have a bill flattened at its base; and the sides of the mouth are defended with stiff bristles, to confine the struggles of their prey. The members of this family are distributed through the temperate and tropical portions of the Old World, and the temperate parts of the New. Between the tropics, however, they are replaced in America by the tyrant-shrikes and fly-catching warblers, both which groups are unknown in Africa and India. The *fly-catchers* of Europe are small birds, about the size of a sparrow. One species is common in Britain, usually arriving about May. It has been observed to take its station on the top of a stake or post, from whence it springs forth on its prey, catching a fly in the air, and hardly ever touching the ground, but returning to the same stand for many times together.

III. FISSIROSTRES.—The group of Insessores thus designated is a comparatively small one; but it is very distinct from all others in the beak, which is short, broad, horizontally depressed, slightly hooked, and very deeply cleft, so that the opening of the mouth is extremely wide. The birds possessing this kind of bill are adapted for capturing insects on the wing, receiving their prey in full flight into their mouths, which remain open for that purpose; and the victim is secured by a gluey exudation within, and a strong fence of bristles on the outside, which also serves to protect the soft parts of the head from its struggles. Although such is the typical or characteristic form of the bill in this group, it is not always seen. In some species the bill is stronger and longer; and these also are distinguished by having the external toe nearly as long as the middle one, and attached to it until nearly its end; to these the name of *Syndactyli* was given by Cuvier, who associated them into a separate group. The Fissirostres as a whole are peculiarly distinguished by having the powers of flight developed to the highest degree. All the energies of

their nature seem concentrated in this one perfection; for their feet are always very short and weak, and serve but for little else than to rest the body after flight. They may be separated into diurnal and nocturnal, like the birds of prey.

This group may be divided into the five following families:—Hirundinidæ, or Swallow tribe; Caprimulgidæ, or Goatsuckers—both these present, in a remarkable degree, the organization which has been described as characteristic of the order; the remaining families have a longer and narrower bill, and are syndactylous—Meropidæ, or Bee-eaters; Halcyonidæ, or King-fishers; Todidæ, or Todies.

The Hirundinidæ, containing the swifts and swallows, are diurnal birds, remarkable, like the diurnal Raptores, for their close plumage, the extreme length of their wings, and the rapidity of their flight. The *swifts* possess these characters in the highest degree, and surpass all other birds in the power of sustaining a rapid flight for a long time. They are distinguished from the swallows by having the hind toe directed very much forwards; and all four toes are armed with strong crooked claws, which give to the bird such a firm grasp, that it can sustain itself by the side of perpendicular rocks or buildings with great facility. In some species, the tail feathers are very stiff, as in the woodpeckers, and serve as an additional support. They spend their time almost entirely in the air, and pursue insects in flocks, sometimes at a great height, uttering discordant screams. They nestle in the holes of walls and rocks. The *swallows* are less capable of sustaining a continued flight than the swifts, as is shown by their weariness after or during migration, on which occasions they have been seen to alight flat upon the sea. Several species exist in Europe, and many more in other parts of the world. Among them may be mentioned a small species inhabiting the Indian archipelago, which forms its nest of a species of sea-weed, which it macerates in its stomach and then arranges in layers. These *edible birds' nests*, as they are commonly termed, are highly prized as delicacies in China, and constitute an important article of traffic with that country.

The Caprimulgidæ, or *Goatsuckers*, are nocturnal birds, and have the same light soft plumage which characterizes the owls. Their eyes are large, and their gape still wider than that of the swallows, so as to be capable of engulfing the largest insects. They come forth in the twilight and return to rest before morning; but in their other habits they much resemble the swifts, with which, indeed, they are closely connected by intervening species; *i.e.*, while there are goatsuckers which fly by day, skimming over the surface of ponds in small flocks, precisely in the manner of swallows, there is also a swift which only flies at night.

The family of Meropidæ, or *Bee-eaters*, is confined to the warm regions of the Old World; only one species being known as having occasionally strayed to Britain. They have long and pointed wings and short feet, and fly in the manner of swallows. The European Bee-eater annually visits Italy, in flocks of twenty or thirty, and may be seen skimming over the vineyards and olive plantations, especially pursuing bees and wasps. It is remarkable that they are never stung by these; they seize the insect, and at once crush it by the snap of their powerfully compressive beak.

The Halcyonidæ, or *King-fishers*, are remarkable for the great length of the bill, and the extreme shortness of the feet. Their habits are sedentary, much resembling those of the fly-catchers; but their food is more various. The common British species partly lives on small fish, which it takes by precipitating itself into the water, either from the branch on which it had perched, or by suddenly arresting itself during rapid flight, poising for an instant, and then plunging. It returns to its perch to gulp its prey, first killing it by repeatedly beating it against a bough. The Todidæ, or *Todies*, are small American birds, resembling the king-fishers in their general form and may be regarded as representing them in the New World.

IV. Tenuirostres.—This group, it has been well remarked, "is among the most interesting of the animal world. Deriving their subsistence, for the most part, from the nectar of flowers, we never fail to associate them in our idea with that more beautiful and perfect part of the vegetable creation, with which, in their delicacy and fragility of form, their variety and brilliancy of hues, not less than by their extracting their nourishment from vegetable juices, they appear to have so many relations." This tribe is confined exclusively to the torrid zone and southern hemisphere. The length and slenderness of the bill are its distinguishing characteristics. It is not by this, however, but by the long filamentous tongue, that the juices of flowers are sucked up; and to protect this important organ, the peculiar conformation of the bill seems chiefly intended. The tongue is often simply forked; but is sometimes divided into so many slender filaments, as to resemble a painter's brush. The feet are very short and delicate. All these characters are presented in the greatest perfection by the Trochilidæ, or Humming-birds, which are the types of the group. In the Cinnyridæ, or Sun-birds, the feet are more lengthened. The Promeropidæ, or Hoopoes, have the tongue short. The Paradisiadæ, or Birds of Paradise, are separated by the strength of the feet. And the Melithreptidæ, or Honey-suckers, have the bill notched.

The Trochilidæ, or *Humming-bird* tribe, so celebrated for the metallic lustre of their plumage, and particularly for the gem-like brilliancy of some of their feathers, have, within their long slender beak, a tongue capable of protrusion like that of the woodpeckers, and divided almost to the base into two filaments. These filaments are *not* tubular, as they are sometimes described, but are flattened. It is not improbable that the tongue may serve for catching insects, as well as for sucking the juices of flowers; since it is unquestionable that, like others of the order, the humming-birds are partly insectivorous. When hovering over flowers, these birds balance themselves in the air by a rapid motion of the wings, like many flies; and it is by this movement that the *humming* sound is produced, from which they take their name. The flight of these birds, the smallest of the order, is so rapid as frequently to elude the eye. They live solitarily; defend their nests with courage, attacking with their needle-like bills the eyes of intruders, which makes these minute creatures truly formidable; and fight with each other desperately.

This family is exclusively confined to America; and, with few exceptions, to the southern part of that continent and the adjacent West Indian islands. More than one hundred and seventy species are at present known; and others are constantly being discovered. The smallest of them, when plucked, are less than a large humble-bee; and one only, which is much larger than any others as yet known, nearly equals the common swift in size. This bird is also one of the dullest coloured, and its general resemblance to the swifts is very manifest.

The Cinnyridæ, or *Sun-Birds*, represent the humming-birds in the eastern continent. They are closely allied to the Trochilidæ in general structure and in the mode of obtaining their food, but their tongue is not so deeply divided. They are small birds, and the males have the most brilliant colours, rivalling those of the humming-birds, during the breeding season; but the garb of the female, and of the male at other times of the year, is much more dull. The Promeropidæ, or *Hoopoes*, are also restricted to the Old World; one species, the common hoopoe, annually visits Europe, in company with the bee-eaters and other swallow-like birds.

The PARADISIDÆ are among the largest of the Tenuirostres, and seem to live, like the rest of the order, chiefly upon soft vegetable substances. They are confined to New Guinea and the neighbouring islands, and for a long time no specimens were obtained but such as had been deprived by the natives of their legs, whence it was at one time supposed that they were destitute of limbs, and supported themselves entirely upon their airy plumes. The extraordinary development of their feathery appendages is well known; but of the purpose these serve in their economy, no plausible account has been given. The very restricted locality of these birds, and the savageness of the people who inhabit it, have prevented naturalists from obtaining much knowledge of their habits. They are partly supported upon insects.

The MELIPHAGIDÆ, or *Honey-Suckers*, are distinguished from all the preceding families by their notched bill; their tongue is terminated by a bunch of delicate filaments, and the hind toe is so strong and robust that it serves as a support to the bird during the process of feeding. This group is chiefly confined to Australia, where its members abound in great variety of form, and where they find a never-failing support in the luxuriant vegetation of that country.

The members of the family CERTHIADÆ, which consists of the Tree-creepers, Nuthatches, &c., strongly resemble the scansorial birds in their habits, but they more closely approximate to the Tenuirostres, and especially the Meliphagidæ, in general structure. Like those, they are of small size; the foot has three of the toes directed forwards, and the bill is more slender and delicate than that of the woodpeckers. The *Tree-creepers* bore into trees, however, and rest upon their tail in climbing, much as do the woodpeckers, but they rather seek for their food in the natural chinks of the trees, or among the mosses and lichens which cover the branches. The *Nuthatches* have a stronger bill, which is straight and pointed, like that of the woodpeckers. They use it, however, rather to scale off the bark than to perforate it, and they do not support themselves upon the tail. They feed not only upon insects but upon various seeds, and are celebrated for the instinct of fixing a nut in a chink while they pierce it with the bill, swinging the whole body as upon a pivot, to give effect to each stroke. The British species is about the size of a robin, its note loud, and its disposition remarkably fearless.

Order II.—Raptores.

The rapacious birds constitute a well-marked group, which may be compared with that of the Carnivora among Mammalia. In comparison with the Insessores, their number is but few; for had it been otherwise, they would soon have extirpated the whole race. They usually breed but slowly, leading solitary lives, and never appearing in numerous collections. Most of them are large and powerful birds; and, what is an exception to the general rule, the female is larger than the male, but her plumage is usually of a duller aspect. There are few of this family which do not show great strength of wing; but the power and swiftness of flight that are possessed by the different species, vary with their habits. As among the carnivorous Mammalia, we find some species adapted to pursue and bring down living prey; and these are endowed with the greatest activity and strength of movement. Others feed upon the carcasses of animals that have met their death in various ways, in search of which they have to perform long journeys: these are endowed with great power of wing, but their swiftness is less. The least degree of these faculties among the raptorial birds, exists in those which feed upon decomposing animal matter, or which hunt after such small game as it requires neither swiftness nor power to seize.

Rapacious birds are all remarkable for their strong hooked bill and large acute talons. The force of these is indicated by the size of the muscles of the legs and thighs; and the foot is usually but of moderate length, that its power may not be lost by being diffused over too large a space. It is by the talons that the prey is usually struck first; and, when secured by the feet, it is torn open by the bill. For this purpose there exists in the typical Raptores a strong and sharp tooth-like projection from one or both of the mandibles, which is of material assistance; but in such tribes as feed on carrion or small animals, it is nearly or entirely deficient.

This order is usually divided into two series—the *diurnal* and *nocturnal* Birds of Prey; the former containing the falcons, eagles, vultures, &c., and the latter the owls. As the falcons, vultures, and owls, however, constitute three distinct families of equal rank, it will be preferable thus to consider them. They are chiefly distinguished from each other by the presence or absence of the tooth on the bill, already adverted to; by the degree in which the neck is clothed with feathers or destitute of them; by the size of the eyes, and the presence or absence of a fringe of feathers around them; and other minute characters, the relation of which with the chief peculiarities of the several families will be more obvious when they are particularly considered.

The FALCONIDÆ, or *Falcon* tribe, exhibit the perfection of the order, and correspond very closely in their general habits, and the adaptations of structure to them, with the Feline tribe among the Carnivora. Their bodies are of moderate size; their forms light but powerful; their flight graceful; and their courage very great. They are technically distinguished from the vultures, to which (being both diurnal birds of prey) they are most nearly allied, by the bill being toothed, as well as shorter and sharper; and by the acuteness and strong curve of their talons, which, like those of the Cat tribe, are retractile. The members of this family are almost universally diffused over the earth's surface.

The Falconidæ have been commonly divided into the *noble* and *ignoble*; the latter not being susceptible of being trained to the (so called) noble sport of falconry. The noble division comprehends the *Falcons-proper*, which are distinguished from the rest by the size of the tooth on the mandible, and by the power of their wings, which are long and pointed. They are the most courageous of all the family in proportion to their size; and are especially adapted to pursue and bring down their prey while it is on the wing. The *Eagles* may be considered as ranking next to the falcons. They are the largest and most powerful of the whole group, and pursue and destroy quadrupeds as well as birds. They are distinguished from all other Raptores by having the legs and feet feathered quite down to the toes. The *Hawks*, *Kites*, *Ospreys*, and many other tribes, are well known forms of this family.

The birds of the family VULTURIDÆ, or *Vulture* tribe, are on the whole much larger than those of the previous family, but they are much less courageous. The beak is lengthened, and curved only at the end, and it is not in the least toothed. The power of their talons by no means corresponds with the stature of these birds, and they make more use of their beak than of their claws. Hence they are not adapted for a contest with a courageous victim, and rather seek carrion already decomposing, to which they are attracted—whether by the sight or by the smell is still a disputed question. On this they gorge to repletion; and, in order that the parts of the bird which come most in contact with this offensive food should not be soiled and matted together (as they would be if covered with feathers), the skin of the head, and frequently also of the neck, is destitute of covering. The legs, too, at their lower part, are covered with scales, and not with feathers, as in the eagle.

The Vultures are most abundant in hot climates, where they perform important services, by removing decomposing carcasses, which would otherwise be a source of offensive and noxious exhalations. They are sparingly scattered over the south of Europe; in Egypt they are more numerous; and in tropical America, although the species are fewer, the individuals are much more plentiful.

The family of STRIGIDÆ, or *Owl* tribe, including all the nocturnal birds of prey, is characterized by the large proportion of the head to the body, and by the size of the eyes, which are surrounded by a fringe of feathers. Their soft downy plumage, too, may at once be distinguished from the firm and sharply-cut feathers of the diurnal Raptores. All these peculiarities have reference to their habits. The cavity of the brain is not proportionally larger than in other birds; and the space between it and the exterior of the skull is occupied by large cells, which communicate with the ear, and probably assist the sense of hearing. The size of the eyes, again, has an evident relation to the small amount of light in which they are usually to be employed; the pupils are so large that the birds are dazzled in full day, and hence in part arises the stupid appearance which they exhibit. The fringe which surrounds them probably has for its object to prevent the interference of light from the sides, above, or below, and to enable them to concentrate their whole power of sight upon the object directly before them—as when we look through the hand contracted into a tube at some object which we desire to see more distinctly. This fringe is most remarkable in the *Barn Owl* and its *allies*. In the owls which are partly diurnal

Barn Owl.

in their habits, this circular fringe is hardly perceptible. The owls seek their prey, not by power of flight, but by stealing upon it unawares; hence the movement of their wings should be as noiseless as possible; and this object is peculiarly answered by the downy character of the whole plumage, and by a particular arrangement of the barbs of the feathers at the edge of the wings. The external toe, as in the osprey, can be directed backwards as well as forwards. Their period of activity being twilight, or during moonlight nights, that of their repose is during the day; and, if then disturbed, they make the most ludicrous gestures, which seem principally intended, however, to enable them to get a clear view of the object which annoys them. Owls are feared by all smaller birds, which do not hesitate, however, to attack them during the day. Their food is wholly animal; consisting of mice, frogs, and other small terrestrial vertebrata, small birds, fish in some instances, and insects.

Order III.—Scansores.

The peculiar disposition of the toes in the birds of this order, two being placed behind, and all four arising nearly on the same level, gives them great facility in climbing the branches of trees, but proportionally impedes their progression on level ground. By this character they may be readily distinguished from all other birds, notwithstanding many and striking variations in the form of the bill and wings. The nests of this order are generally less skilfully constructed than those of the Insessores; and the birds often employ for this purpose the hollows in decayed trees: one family is remarkable for depositing its eggs in the nests of other birds. Their flight is ordinarily but moderate. Their nourishment consists of insects and fruits; and the species feeding upon each may be distinguished by the greater or less robustness of the beak. This order may be divided into the four following families:—1. PICIDÆ, or *Woodpeckers*, which may be regarded as the types of the order, presenting its peculiar characters in the highest degree. 2. CUCULIDÆ, or *Cuckoos*. 3. RAMPHASTIDÆ, or *Toucans*. 4. PSITTACIDÆ, or *Parrots*. This last family is separated from the rest by so many peculiarities as almost to constitute a distinct order.

1. The PICIDÆ are chiefly characterized by their long, straight, angular bill, the end of which is compressed into a wedge, adapted to perforate the bark of trees. The tongue is also of peculiar conformation, being worm-like in its shape, barbed at its point, and capable of being suddenly thrown out to a great length. By this mechanism the bird can introduce it into holes and crevices, or even under the loose bark of trees infected by those peculiar insects which it is its province to destroy, and these they obtain, not only by transfixing them with the barbed point, but by causing them to adhere to it by means of a viscid glue with which it is covered. The feet of these birds are short but very strong; the nails are broad and crooked. As an additional and powerful support in their rapid and perpendicular ascent up the trunks of trees, their tail-feathers are very firm, and terminate in points; so that this member, being pressed against the bark, is of assistance to the bird in maintaining its perpendicular attitude. The species of this family are extremely numerous, and are generally distributed over the globe, with the exception of Australia.

2. The CUCULIDÆ, or *Cuckoo* tribe, are a numerous and diversified race, spread over all the temperate regions of the globe. They are principally distinguished by the short and slender make of the feet, of which one of the back toes can be occasionally brought forwards. The beak is of mean length, slightly arched, and compressed at its sides. Most of this family are migratory, and scarcely any build nests of their own. They fly rapidly, and subsist upon insects and fruits. The common cuckoo has long been celebrated for its habit of depositing its eggs in the nests of other birds, generally insectivorous species; and, what is more extraordinary the foster parents, often of species inferior in size, bestow as much care upon the young cuckoo as upon their own proper nestlings, even though the rearing of this involves the destruction of their own young. For, if other eggs are hatched with that of the young cuckoo, the latter speedily ejects the rightful tenants from the nest, and receives all the attention of their parents. If it were not for this, it must speedily perish for want, from the frequency and urgency of its demands for food, and its incapability of assisting itself, up to an advanced age. The cuckoo feeds principally on caterpillars, and

also devours cherries and the smaller fruits; it is sometimes seen to pursue insects on the wing. It is an unsocial bird, seldom congregating with its species, except at the time of migration.

3. The RAMPHASTIDÆ, or *Toucan* tribe, are easily recognised by the enormous size of the bill, which is nearly as large and long as the body itself, but internally very light and cellular; its edges are toothed, and both mandibles are arched towards the tip. The tongue is narrow and elongated, and laterally barbed like a feather. Their feet are formed more for grasping than climbing; accordingly, they always live among trees, and proceed by hopping from branch to branch. So light and elegant are their movements, that in the living bird, in its natural situation, the disproportionateness of the bill does not attract observation. Its large size is to give a more extensive distribution to the nerves of smell, for the purpose of enabling the birds to discover their food, which consists chiefly of the eggs and young of other birds, and also to enable them to obtain it, by dipping it into the deep hanging nests which abound in their natural abodes, for which purpose its surface is endowed with considerable sensibility, enabling it to feel the contents of these nests. The size of the bill prevents their swallowing their food in the usual manner, and they accordingly throw it into the air and catch it in the throat as it descends, a habit practised by many other birds also, in which the tongue is unusually short, or of a form unfit to assist in swallowing. Toucans are mostly large-sized birds, and clothed with brilliant plumage. They are peculiar to the warm regions of America, where they live in small flocks, different species often associating together. They nestle in the trunks of trees.

4. The PSITTACIDÆ, or *Parrots*, constitute a family which is very widely diffused through the torrid zone in both new and old continents, and is scarcely found beyond it. It contains a large number of species, each of which has its peculiar locality, the short wings of these birds not enabling them to traverse large tracts of sea. They correspond with the other Scansores in little else than the structure of the foot, and this is formed rather for grasping than for climbing. It is also used for conveying food to the mouth, a peculiarity nowhere else seen but in the goat-suckers. Their beak is stout, hard, and solid, curved and pointed very much as in the diurnal birds of prey, which they may perhaps be regarded as connecting with this order. They subsist, however, upon vegetable food at all ages, and have a peculiar provision for supplying their young, analogous to that which will be described as possessed by the pigeons. Their jaws are set in motion by a greater variety of muscles than are found in other birds. Their tongue is thick, fleshy, and rounded; and their larynx, or organ of voice, is more complicated than in other birds—by which peculiarities they gain their facility of imitating the human voice as well as other sounds. Their voice, in a state of nature, however, is loud and harsh. They use their crooked bills in clambering upon trees, and nestle in hollow trunks. They subsist upon the succulent parts of vegetables, especially bulbs and fruits. They are distinguished from the rest of the scansorial birds by their intelligence and docility, qualities in which some species are unsurpassed by any members of the class.

Order IV.—Rasores.

This order, corresponding with the *Gallinaceæ* or poultry tribes, consists of birds with bulky bodies, and essentially formed to live upon dry ground. They are the most easily domesticated of the whole class; they furnish men with a considerable amount of savoury and wholesome food, and their fecundity is very great. The majority of them are at once known by their strong thick legs, long necks, short wings, and large ample tails; and the heads of many, especially of the males, are ornamented with elegant crests. The form of the bill is well seen in the common cock; the upper mandible is vaulted, and, at the same time, destitute of any notch; the whole is short and strong, having a peculiarly horny appearance. The wings are muscular, but their feathers have rounded ends; and the breast-bone presents a much smaller surface for the attachment of the muscles than in the previous orders, so that the power of flight is comparatively small. Their food, with few exceptions, is entirely vegetable, and their chief support is derived from the seeds and grains of various plants. Many of them eat also the green portions, and are in this respect nearly peculiar among birds. Almost all of them have a large crop and an extremely muscular gizzard.

The Rasores are mostly social birds, and are readily domesticable. In general they deposit and hatch their eggs on the ground, in a rudely constructed nest of straw, but some of them, which reside in forests, build in trees. Each male usually associates with many females; he takes no part in the construction of the nest or in rearing the young, and these are generally numerous and able to run about and provide for themselves the moment they quit the shell. When this is the case, the male is larger and more gaily adorned than the female. But in the few species which associate in pairs, such as the ptarmigan and partridge, the sexes nearly or quite resemble each other, both in size and colour.

From the strong resemblance which subsists among all the birds of this order, the division of them into families is difficult. The following may be regarded as the most natural distribution of them into groups:—1. PHASIANIDÆ, *Pheasant* and *Fowl* tribe, distinguished by the shortness of the hind toe, the presence of spurs on the legs, and the beautiful development of the tail. 2. CRACIDÆ, or *Curassow-birds*, a tribe of poultry restricted to America, the legs of which are destitute of spurs, and the hind toe so much developed, as to give considerable power of perching. 3. TETRAONIDÆ, *Partridge* tribe, having a very short hind toe, and also very short tails. 4. COLUMBIDÆ, the *Pigeon* tribe, which are much isolated from the rest, and may be regarded as in some respects allied to the Insessores. From the well-known character of most of these birds, the description of the families need not be detailed.

1. The whole of the PHASIANIDÆ, with the exception of the turkey, are restricted to the Old World. The characters by which they are known from the other families, are those which peculiarly distinguish the order; hence there can be no hesitation in regarding this family as its type. It is in the hotter parts of Asia that the most brilliantly coloured birds of this family present themselves in the greatest numbers. The *peacock*, for example, abounds in the forests of India; and the wild specimens even surpass the domestic ones in brilliancy. The *turkeys* are the only representatives of this group in the New World, whence they were brought by the early discoverers, and are now quite naturalized in Europe. The *guinea-fowl* is originally a native of Africa, where it lives [illegible] in the neighbourhood of marshes. Its noisy and querulous disposition renders it incommodious in poultry-yards, although its flesh is excellent. Of our common fowls, the original stock, like that of most domesticated races, is obscure; but it was probably a species of *gallus*, inhabiting Java or Sumatra. The *pheasants* were originally brought from the banks of the Phasis in Asia Minor; several very handsome species abound in different parts of Asia.

2. The CRACIDÆ, or *Curassows*, which are restricted to America, offer a remarkable contrast, in their plain colours, to the brilliant plumage of the Asiatic race which occur in nearly the same parallels of latitude.

They are equally capable of domestication with the *fowls*; and their flesh is of excellent quality.

3. The TETRAGONIDÆ, or *Grouse* tribe, also differ strongly from the Phasianidæ, in the comparative dullness of their plumage, as well as in the extreme shortness of the tail. The *grouse* are formed to inhabit cold climates, and are found in Europe, Asia, and North America. The largest species, commonly known as the *capercailzie*, is the largest of the true poultry, surpassing the turkey in size. It particularly feeds on pine shoots. These birds strut with outspread tail, in the manner of the turkeys; and are polygamous. The *ptarmigan* live in pairs, and do not strut in this manner; the more generally diffused species become white in winter; there is one species peculiar to Britain, however—the moor-fowl or red grouse—which does not change. Nearly all the grouse have the toes and legs more or less covered with soft feathers; a character which disappears in the *Perdrix*, an extensive group, scattered in nearly all parts of the Old World, but unknown in the New. In the *Quails*, we have the miniature resemblance of partridges, but the tail is so short as to be nearly imperceptible.

4. The family of COLUMBINÆ, containing a large number of elegant and lovely birds, appears as much isolated from the rest as the Parrots are from the Scansores. Although it is particularly numerous, and spread over every part of the world, there is no difficulty in distinguishing its members from all other birds. One of their chief peculiarities is the *double* dilatation of the crop, which expands on each side of the gullet; and the young are fed with grain disgorged from this receptacle by the parent, and impregnated with a secretion which it forms. These birds live invariably in pairs; they nestle in trees, or in the holes of rocks, and lay but few eggs, though they breed often. This family includes the whole of the well-known tribe of *Pigeons* and *Doves*. Some of the tropical species are of considerable size, and of very rich plumage.

The *passenger-pigeon* of North America breeds in such immense numbers, as to darken the air for a considerable period when the flock takes to flight, and to destroy all the herbage where they settle.

Order V.—Cursores.

This order contains a small number of species, differing so considerably from one another, that almost every one may be regarded as belonging to a different family, and yet all agreeing in one characteristic—the non-development of the wings, and the enormous size and power of their legs—by which they seem justly separated from all other orders of birds. They may be regarded as in many respects intermediate between the Rasores and Grallatores; but they also present many remarkable points of approximation to the Mammalia. The most obvious of these are the loss of the powers of flight, and the dependence on the legs alone for locomotion; and the deficiency (most conspicuous in the cassowary) of barbs upon the feathers, so that they much resemble hair. In their internal structure, moreover, similar approximations exist: thus the ostrich has the rudiment both of a diaphragm and urinary bladder, which organs are wanting in other birds, whilst all Mammalia possess them.

Although destitute of the powers of flight, wings exist in an undeveloped or rudimentary state; and it has been observed that, when the ostrich is running, its small anterior members execute analogous motions, which seem to assist it. Their muscles, however, requiring but little strength, the sternum has no prominent keel, but is flat, as in man; whilst, on the other hand, the muscles of the posterior extremities are of enormous size and power. Only five genera are at present known to exist in this order; and of one more, which seems now extinct, remains are preserved to us which indicate its existence two centuries since.

The *struthio*, or ostrich, is a well-known bird in the tropical parts of the eastern hemisphere; its feathers do not differ so widely from those of other birds as do those of the cassowary, being furnished with barbs; but these do not adhere to one another, so that no continuous resisting surface is formed. Still the wings present sufficient expanse to assist the bird in running; which movement it executes so swiftly that scarcely any animal can overtake it. The *rhea*, American ostrich, or nandou, is about half the size of the African ostrich, and more thinly covered with feathers. Two species exist, one inhabiting the central parts of South America, where it is as abundant in some localities as the ostrich in Africa; and the other in Patagonia, where it is rare. The nandou is easily tamed when young, and its flesh is eaten: it has been observed to swim with facility.

The *casuarius*, or cassowary, has wings shorter than those of the ostrich, and quite useless in aiding progression. Besides the peculiarity of the feather, which has been already mentioned as giving it the appearance of hair, there is another, consisting in the great development of the *accessory plume*, so that two or even three equal stems appear to grow from the same quill. In its general form and aspect it much resembles the ostrich, but differs in the structure of its digestive organs. The head is surmounted by a bony prominence, covered with horn. The skin of the head and neck is bare of feathers, and of a bright blue and flame colour; it is furnished with wattles, like those of the turkey-cock, which change colour under the same circumstances. It lives on fruit and eggs, but not on grain. It is an inhabitant of the Indian archipelago, and is the largest-bodied of birds, next to the ostrich.

The *dromaius*, or emu, is a native of New Holland, and is closely allied to the cassowary; but its plumage is more dense, from its feathers being more barbed.

The *apteryx* of New Zealand appears, of all birds, to have the wings reduced to the most simple rudiments; and it presents, at the same time, many points of approximation to the Mammalia. It has a complete diaphragm, and no air cells exist in its abdomen; nor are any of its bones hollow. The bill is long and slender; the rudiments of wings are terminated by a sharp hook, which seems to be an important organ of defence; the feet have three toes in front, and the rudiment of a fourth behind, the claw of which is alone externally visible. The size

The Apteryx.

of this bird is about that of a domestic fowl, and its colour a deep brown. It runs with rapidity, and defends itself vigorously with its feet. It is nocturnal in its time of action, and subsists on insects. Its native name is *kivi-kivi*, derived from its cry.

With this group is probably to be associated the *dodo*, now known to us only by some very imperfect remains, and by the paintings and descriptions of naturalists nearly two centuries since, when it seems to have existed in the islands on the eastern coast of Africa, especially Madagascar; though no traces of it can now be found there.

Order VI.—Grallatores.

The Grallatores, Waders or Stilt-birds, derive their name from their habits and conformation. Their long legs raise up their bodies as it were upon stilts; and, thus elevated, they frequent the banks of rivers and lakes, marshes, the shores of estuaries; and, whilst resting with their feet upon the land, derive their nourishment chiefly from the water—some feeding exclusively upon small fishes, aquatic molluscs, worms, small reptiles, and water insects—whilst others are of more terrestrial habits and food. Such as are more especially aquatic have a short web to their toes. Their wings are long, affording them the power of changing their habitation with the seasons, which most of them enjoy. During flight, they stretch out their long legs behind, to counterbalance their long necks; and the tail is always extremely short, its function as a rudder being transferred to the legs. They mostly construct or choose their nests upon the ground; and the young are enabled to run about as soon as hatched, except in those species which live in pairs. The Waders are remarkable for their power of preserving a motionless position upon one leg for a considerable time.

The Waders may be grouped together under four families, principally characterized by the form of the beak:—1. Ardeidæ, the *Heron* tribe, in which the beak is long, thick, and stout, and has usually cutting edges, as well as a point. 2. Scolopacidæ, the *Snipe* and *Woodcock* tribe, in which the bill is long, slender, and feeble. 3. Rallidæ, the *Rail* and *Coot* tribe, in which the bill is less slender; but the chief character is derived from the extreme length of the toes. 4. The Charadriadæ, or *Plover* tribe, in which the bill is of moderate size, and the back toe either entirely absent, or not long enough to reach the ground.

1. The family of Ardeidæ includes the Cranes and Storks, besides the true Herons. By the *Cranes* this order is connected with the last, for nearly all of them are large birds, with short powerless wings; their necks long and frequently naked, and their habits more terrestrial than those of any of their congeners. They feed almost exclusively upon vegetables: and have a muscular gizzard. Most of them live in warm latitudes; and those which frequent Europe migrate southwards in the autumn and return in the spring.

The *Herons* differ from the cranes in being decidedly carnivorous; they are known by a larger and more pointed bill, and by the greater length of their legs. Their stomach is a large undivided sac, but slightly muscular. As a whole, they are the most beautiful of all the Waders; not so much, however, on account of the colours of their plumage, as from the elegant crests and prolonged feathers which ornament nearly all the species. They build in societies, usually in trees in the neighbourhood of banks of rivers; but generally feed and live solitarily. They are chiefly supported by fish, for which they watch in some concealed situation, transfixing them as they pass, with their long and sharp bills. The *storks* are less aquatic in their habits than the rest of the family, nestling by preference on towers and chimney-stacks; each pair returning to the same place in the spring, after having passed the winter in Africa. The common white stork of Europe is held in much popular respect, owing to its utility in destroying snakes and other noxious animals; but in England, almost every one that shows itself is shot, whence the species is very uncommon.

2. The Scolopacidæ, or *Snipe* tribe, characterized by their long, slender, and feeble bill, which only enables them to bore in the mud in search of worms and small insects, have all nearly the same conformation, the same habits, and the same distribution of colours; so that it is difficult to distinguish among them. They are also remarkable for the delicacy of their legs, and the smallness of the hinder toe. They run with vast celerity, and

Stilt.

have considerable powers of flight; and they have also the faculty, in part, both of swimming and diving. The females are usually larger than the males, and lay their eggs on the ground, in little or no nest. Their geographic dispersion is as wide as their locomotive powers are great. The shores of every part of the world abound with *sandpipers* and *curlews*; whilst snipes, woodcocks, &c., frequent the inland waters and marshy grounds. The *stilts* surpass all the rest of this family, and probably therefore all other birds, in the length and slenderness of their legs.

3. The Rallidæ, or *Rail* tribe, are furnished with very long toes, for traversing aquatic herbage; and they are even useful in swimming, especially in some species in which their surface is extended by a border of membrane. They are also distinguished by the form of the body, which is very thin and narrow—a structure adapted to their habits and mode of life, since they live for the most part in the thick and tangled recesses of the reeds and aquatic vegetables which clothe the sides of rivers and morasses. Their wings are short, or of moderate length, and their flight feeble; but they run with considerable swiftness. They are for the most part solitary and timid birds, hiding themselves at the least approach of danger, but quitting their semi-aquatic retreats morning and evening, to feed in more open spots. The flesh of these birds is delicate; and, as they live chiefly upon aquatic seeds and vegetable aliment, they may be regarded as aquatic Gallinaceæ. By the peculiar form of their bodies, and their powers of running, they are able to make their way through dense masses of reeds and high grass, with so much facility, as to escape even after being desperately wounded. The females are mostly larger than the males, and exceed them also in brightness of colouring. The *rails*, *coots*, and *crakes*, are the chief British species of this family, and are sufficiently characteristic of it.

Flamingo.

Under the family Rallidæ has been classed a remark

able bird, the place of which is rather doubtful. This is the *flamingo*, which is perhaps rather to be considered as one of the duck tribe, with an inordinately long neck and legs. The front toes are webbed to their ends, and the hind toe is extremely short. The mandibles are suddenly bent downwards, about the middle of their length; and they are roughened at the edges, like those of the ducks, to which the fleshiness of the tongue also shows an alliance. They feed on mollusca, insects, the spawn of fishes, &c., which they seize by means of their long neck, turning the head downwards, to use to advantage the crook in the upper mandible. They construct their nests in marshy situations, placing themselves astride of them during the act of incubation, being incapacitated by the length of their legs from sitting on them in the usual manner.

4. The CHARADRIADÆ, or *Plover* tribe, are less aquatic than most of the other families. The legs are long, and the back toe is either quite absent, or so short as not to reach the ground. They live only on sandy and unsheltered shores, or on exposed commons, congregating in flocks, and running with great swiftness. The bill is usually of moderate strength, enabling these birds to penetrate the ground in search of worms, to obtain which they have the habit of patting with their feet, which causes the worms to rise. The species in which the bill is more feeble, frequent meadows and newly ploughed land, where this food can be obtained with greater ease; those which have stronger bills subsist additionally on grain, herbage, &c. Of the plovers several species exist in Britain; and others are distributed through most other countries. Some chiefly frequent the sea-coast, and others the upland moors. The *Lapwings* are nearly allied to the plovers, and, like them, are migratory, passing the winter in warm latitudes; they are peculiar to the eastern hemisphere. They are very noisy birds, screaming at every sound they hear, and defending themselves with courage against birds of prey. They derive their name from the stratagem by which they lure away intruders from their nests; they drop their wings in flight, appearing as if wounded, and thus induce their pursuers to follow them to a considerable distance.

Order VII.—Natatores.

The Swimmers are, of all the orders of birds, the most easily recognisable by the structure and position of their oar-like feet. This peculiarity, which occasions that awkwardness of gait on land which every one may observe in ducks and geese, is extremely favourable to those birds whose business "is in the great waters." The body is boat-shaped, and the neck is very long in proportion, for the purpose of reaching prey beneath the water when the bird is floating on the surface. The thick downy covering is rendered impervious to water by the abundant application of the oily secretion. The bones of these birds are not hollow, like those of the rest of the class, but are filled with an oily marrow. In this, and in other points, their structure approximates to that of reptiles. Their circulation is less energetic than that of the other orders, and is capable of being considerably retarded in diving birds, by the obstruction of the respiration, without injury.

As the water is the element on which these birds are formed to move, so does it also supply them with food. Some of them live on aquatic plants and submarine insects, but the greater proportion prey upon fish and those innumerable swimming and creeping things which subsist in the sea and cover its shores. In general, several females associate with one male, and the young are hatched in a condition which renders the co-operation of both parents for their support unnecessary, being able to take to the water and swim about in search of food, the instant they are liberated from the egg-coverings.

This order may be divided into five families—1. The ANATIDÆ, or *Duck* tribe; 2. The LARIDÆ, or *Gulls;* 3. The PELICANIDÆ, or *Pelicans;* 4. The COLYMBIDÆ, or *Divers;* 5. The ALCIDÆ, or *Penguins*. The three first are distinguished by the length of their wings, which enables them to fly well, while in the two latter these members are so short that they seem perfectly useless for any other purpose than that of fins.

1. The ANATIDÆ are distinguished by a thick bill, which is horny only at its extremity; the remainder of the mandibles being invested with a soft skin, which in other birds is found only at their hinder part. This skin in the ducks is extremely sensitive, and by it the animals take cognisance of the food contained in the mud, into which they plunge their bills. The edges of the bill are roughened, either by plates or small teeth arising from it; and the tongue is large and fleshy. These birds live more in fresh waters than in the sea; and many of them (such as geese and swans) are exclusively vegetable-feeders. The ducks, on the other hand, subsist in part upon animal diet; and one tribe of them, the mergansers, feed almost exclusively upon fish. Under the general designation of *ducks*, *geese*, and *swans*, all the birds of this family may be arranged; and as these typical forms are so well known, it is unnecessary to dwell longer on it, although the habits of many species are extremely interesting. This family is very extensively diffused over the earth's surface, and supplies man with an important amount of food, and with the greater part of the *down* which contributes so greatly to his comfort and luxury.

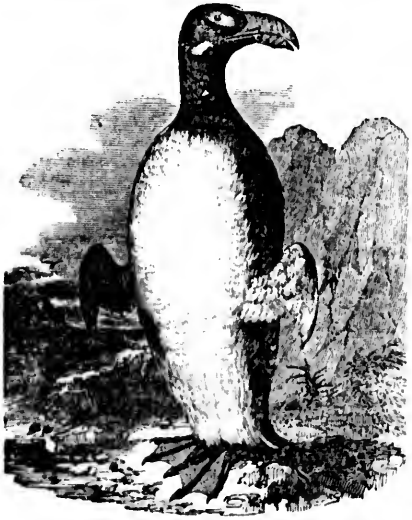
2. The LARIDÆ, or *Gull* tribe, more resemble the higher orders of birds in their general structure, but are deficient in that which constitutes the perfection of the order—the power of swimming and diving. The wings are very long, and their powers of flight considerable. The feet, although webbed, are so constructed as to enable them to walk with ease along the shore in search of food; the legs are slender, and sometimes so long as to resemble those of the waders; the hind toe is very small, and sometimes wanting. Many of the birds of this tribe have a tendency to associate in flocks. In consequence of their capability of protracted flight, they are met with at a greater distance from land than most others; many species are almost constantly on the wing, and brave the most violent storms. They seem to devour almost every description of animal and vegetable food. This family includes, with the *Gulls*, the *Skuas*, *Terns*, *Petrels*, and also the *Albatross*, which is the largest of all aquatic birds, and in its general habits may be described as a sort of marine vulture. It is extremely voracious, and devours almost any thing that falls in its way. Though its wings are powerful, its flight is by no means lofty. No species of it exists in the northern part of the Atlantic; but it is very abundant beyond the Tropic of Capricorn, and is one of the great enemies of the flying-fish.

3. The PELICANIDÆ, or *Pelican* tribe, are characterized by having the hind toe united to the rest by one continuous membrane: notwithstanding this conformation, which renders their feet perfect oars, they are almost the only Natatores which perch upon trees. All of them fly well, and have short legs. They are a large, voracious, and wandering tribe, living for the most part on the ocean, and seldom approaching land but at the season of incubation. The *Pelicans* themselves are remarkable for the length of the bill, which is armed with an abrupt hook at the end; the width of the gape is excessive; and the skin hanging from the lower jaw, and forming the throat, is so extensible as to dilate into a pouch capable of holding a large quantity of fish. The *Cormorants* are allied to these, and are remarkable for being not only voracious but docile, so that they have been trained for fishing, as hawks for fowling. These are very widely distributed over the earth's sur-

The Pelican.

face, while the pelicans are restricted to the warmer latitudes. The *Frigate-birds* are nearly allied to the Cormorants, but differ from them in the excessive spread of wing (which renders them the most powerful flyers in this order—perhaps not being surpassed by any other bird), and in the form of the tail and bill. They feed upon fish, especially flying-fish, both darting at it themselves, when near the surface, and obtaining it from other birds, whom they compel to drop their prey. The *Gannets* are allied to the frigate-birds; but the wings are less extended, and the powers of flight inferior. Some species are termed *Boobies*, from the stupidity they exhibit when attacked. A species about the size of a goose is very common in the British seas, and breeds especially on the Bass Rock, in the Firth of Forth. The Gannets take their prey by hovering in the air at some little distance above the surface, and then dropping down upon any fish that they may see rising within their reach. The air-cells are very largely developed, especially under the skin of the breast, which is almost completely separated by them from the muscles beneath; and it is probable that they may serve as an elastic cushion, to break the force with which the body of the bird would otherwise impinge on the water.

4. The Colymbidæ, or *Divers*, may perhaps be regarded as intermediate in structure between the Duck tribe and the next family. They are all marine birds,



The Great Auk

with a lengthened, strong, straight bill. The wings are in generally remarkably short; and the feet placed so far behind the point of equilibrium of the body, that they will not allow the birds to walk upon land even so well as ducks; but they can pursue the fishes upon which they feed, even beneath the water, with great swiftness. They are few in number, and are chiefly confined to the seas of northern regions.

The Little Auk.

5. The Alcidæ, or *Auk* tribe, exhibit the most remarkable adaptation of the structure of the bird to an aquatic life, with which the entire order presents us. This is best seen in the *Penguins*, whose wings are very small, and covered with mere vestiges of feathers, which resemble scales; so that they serve as admirable fins or paddles, but are totally useless for flight. The feet are placed very far back, so that when upon land the bird stands nearly erect. Having no power of flight, and not being able to run, the penguin may be overtaken with ease upon land; but once in the water, it distances its pursuers, swimming with the ease and rapidity of a fish, and springing several feet over any obstacle that may impede its course.

CLASS III.—REPTILES.

The class of Reptiles, which is the next to be considered, presents us with more diversity of form among its separate orders than any other division of the vertebrated sub-kingdom. Scarcely any animals are more unlike in external aspect than tortoises and serpents; yet we shall find that these extreme forms are connected with each other by a gradual series, and the internal differences are not so great as to prevent their association into one class, distinguished by characters which are common to all. These characters are—their low power of maintaining heat, or cold-bloodedness, arising from the imperfect aeration of their blood, of which only a portion is sent to the lungs at each impulse of the heart (see article Physiology); their oviparous reproduction; the respiration of air exclusively during the whole period of life, no metamorphosis taking place in this class; and the protection of the skin by hard scales or plates. By the first two they are distinguished from Mammalia and Birds, and by the others from Fishes and Amphibia.

The deficiency in the oxygenation of the blood, combined with the slowness and feebleness of the circulation, is connected with general inactivity of the nutritive functions, as well as with obtuseness of sensation and sluggishness of locomotion. It is a curious result of the feeble exercise of these functions, that, as in Amphibia, they may be suspended for a considerable time

without apparent injury to the animal; and that parts separated from the body retain for a long period much of that low degree of vitality which they usually exhibit in connection with it. Although at present Reptiles appear to perform a comparatively insignificant part in the economy of nature, especially in temperate climates, where their numbers are few and their powers feeble, we learn from the records of geology, that there was a period in the earth's history, long antecedent to the creation of Birds and Mammalia, when gigantic animals of this class not only constituted the chief tenants of the earth, but extended their dominion over the waters of the sea.

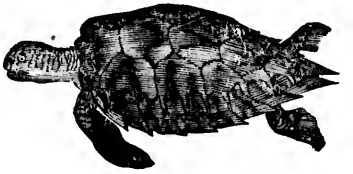
The three well-known forms, *Tortoises*, *Lizards*, and *Serpents*, may be taken as the types of three orders into which this class may be subdivided, namely, the Chelonia, Sauria, and Ophidia. But, in order to embrace some of the fossil species, which present us with other types of structure, it is desirable to create another order—the Enaliosauria—intermediate between the Turtles and Crocodiles; and this last tribe, though possessing the general form of lizards, so far differs from them in the covering of the body (which consists of large plates instead of scales) as well as in some points of internal organization, that a distinct order, Loricata, has been formed for it. These five orders may then stand thus:—1. Chelonia, including the *Turtles*, *Tortoises*, &c.; 2. Enaliosauria, to which the *Plesiosaurus*, *Ichthyosaurus*, and other fossil remains belong; 3. Loricata, comprehending the *Crocodiles*, *Alligators*, &c.; 4. Sauria, including the remainder of the *Lizard* tribes; 5. Ophidia, the *Serpents*.

Order I.—Chelonia.

The order Chelonia differs the most of any of these from the general form of the group. The shell in which the body is enclosed, and into which, in some species, the head, legs, and tail, can be completely withdrawn, would seem a perfectly new organ, to which nothing corresponding exists among vertebrated animals. And the fin-like extremities of the aquatic species remind us more of fish than of other reptiles. The shell, however, is composed of the usual bones of the skeleton, modified only in their form. The upper piece, termed the *carapace*, is usually more or less arched, and is composed of a bony expansion of the ribs, which are consolidated into a firm structure, adhering to each other along their edges, and are covered with horny plates, secreted from the skin like hair or nails. The lower plate, or *plastron*, is formed by a peculiar development of the sternum or breastbone, which, instead of being prolonged forwards into a keel, to give attachment to large muscles, as in birds, is extended laterally for the protection of the subjacent parts.

Most of the Chelonia are deficient in weapons of offence, being destitute of teeth, claws, or other sharp instruments. The jaws are covered with a horny substance, resembling that of the bills of birds; but their surfaces are usually rounded, so as to be more adapted to bruise than to bite. The shell, however, serves as a most effectual means of passive resistance. In the land species it is usually high-arched, and firmly united, so as to bear a very great weight without injury; and the feebleness of the power of motion in these animals is thus compensated. But in the aquatic species it is generally more flattened, so as to oppose less resistance to the water. Some of these have the power of swimming with considerable rapidity, and are altogether more active in their habits than the rest of the order. In these, the shell affords a much less complete protection to the body, and its parts are more loosely united, so that it possesses some degree of flexibility.

Among the families into which the Chelonia are subdivided, it will be convenient to notice first the Chelonidæ, or *Turtles*. These are distinguished by the incompleteness of their shelly covering, and by the peculiar modification of the feet for swimming. The ribs, by the union of which the carapace is formed, are separate from one another around its margin, and the pieces which compose the plastron do not form a continuous plate, but leave great intervals, which are occupied only by cartilage. All the feet are much elongated, particularly the anterior pair, and are flattened so as to serve for oars or paddles. The toes are seldom at all separated, the whole foot being enveloped in the same skin, closely set with hard plates. They live almost entirely at sea, feeding chiefly upon marine plants, and they only come to the shore to deposit their eggs. The œsophagus (gullet) of these animals is lined with long cartilaginous processes, all directed towards the stomach; these seem to have for their object the prevention of the return of the food, which is swallowed together with a large quantity of water; and, when the stomach afterwards ejects the superfluous fluid, these spikes prevent the food from being regurgitated with it.



Green Turtle.

The most important species of this group are the *chelone midas*, or green turtle, so much valued as an article of food; the *chelone imbricata*, or hawk's-billed turtle, the plates upon whose carapace furnish our tortoise-shell; and the *sphargis*, or leathery turtle, which has the shell covered by a thick leather-like skin. They are all chiefly found in warm latitudes.

The Emydæ, *Fresh-water Turtles*, or *Mud Tortoises*, are intermediate in form between the family just described and the Land-tortoises. The character by which they may be most constantly separated from the marine Turtles, is the distinctness of their toes, which are terminated by claws; but a web still exists between the toes, which assists them in swimming, and also prevents the feet from sinking into mud. Rivers, ponds, and running streams, are the haunts of these animals, of which one species is common in the south and east of Europe, and is fattened for food in Germany and Russia, where it is considered a delicacy. The food of the Emydæ consists of mollusca, aquatic insects, small fish, carrion and vegetables. The species at present existing seldom attain any great size, their shells varying from one and a half inch to a foot in length; many of the fossil species are much larger. In several of the Emydæ the carapace and the plastron are but loosely united; and the pieces of the latter are movable upon one another. This is the case in the *Terrapins*, or Box-tortoises, which are able to draw the head and limbs completely into the shell, and to close the latter by folding the anterior, and in some instances the posterior, division of the plastron against the carapace.

The family of Testudinidæ, or *Land-tortoises* is distinguished by the highly arched carapace, and, still more, by the short clubby feet, of the animals composing it. Their armour is harder and thicker in proportion to their size, and also more firmly united together, than that of the aquatic species. The neck and legs are short, and are capable of being drawn entirely within the shell; so that the whole structure of the animal is adapted for passive resistance. The feet, shaped very much like those of the elephant, are adapted for walking on firm ground only, as the surface they present is very small.

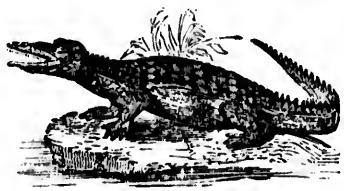
They are subdivided into toes, of which there are five on the fore feet and four on the hind; and these are furnished with short conical claws, well adapted for digging. These animals are of the most inoffensive character possible. They feed only upon roots and vegetables, and upon the worms and slugs that infest these; during the summer they live in woods or among herbage; and they pass the winter, in cold climates, beneath the earth, where they burrow and sleep. They are generally dispersed in all the warm and temperate latitudes; but they do not naturally extend to Great Britain, although individuals that have been introduced have lived to a great age in this country. The commonest species is the *Testudo Græca*, which is an inhabitant of most of the continent of Europe, as well as of many parts of Asia and Africa; it especially abounds near the shores of the Mediterranean. It seldom attains above a foot in length, or weighs more than three pounds. The flesh forms an article of food in Greece. In the East Indies are found species which attain to a much greater size. An individual in the possession of the Zoological Society of London, measures 4 feet 4½ inches along the curve of the back, the breadth of the shell being 2 feet 1 inch, and the weight of the whole animal 285 lbs.

Order II.—Enaliosauria.

The order Enaliosauria has been founded upon two extraordinary fossil genera, the *Ichthyosaurus* and the *Plesiosaurus*. Of these little else than the bones has been preserved to us; and it is therefore impossible to speak with certainty in regard to many parts of their organization. The character by which they are especially connected with the Chelonia is the flattening of the extremities into fin-like paddles, resembling those of turtles. They must have been, therefore, marine animals, endowed with scarcely any power of movement on land; but, although in many points analogous to fish, it is nearly certain that they breathed air like reptiles in general, and that they must have occasionally come to the surface to respire. Moreover, from the remains found in proximity with them, it may be surmised with probability that they fed upon marine animals alone, especially upon the various forms of Cephalopoda, which were particularly abundant at the epoch of their existence.

The general form of the *Ichthyosaurus* (or fish-lizard) appears to have been not unlike that of a crocodile, with the substitution of fins for feet. The head is lengthened into a narrow pointed muzzle, and the jaws armed with sharp and formidable teeth; and it had eyes of enormous size, which must have given it an extraordinary aspect, and probably enabled it to see by night. The skeleton of the commonest species (*I. tenuirostris*) usually measures 3½ feet in length; but portions of another kind have been found, which must have belonged to animals of above 20 feet. It is probable that the skin was destitute of scales, like that of the Amphibia; and, from recent inquiries, it appears that it possessed a sort of cartilaginous fin upon its back, like that of many Cetacea. This animal may thus be considered as presenting a very remarkable combination of the characters of other classes. Its remains, which are found in the lias and oolitic formations, are more abundant in England than in any other country in Europe.

The *Plesiosaurus* was distinguished by the extraordinary length of its neck, which, in the commonest species (*P. dolichodeirus*), occupies nearly half the entire length. The head is very small in proportion, and the tail is short, stout, and pointed. The cervical vertebræ exceed in number those of any other animal known; and in their conformation, have a good deal of resemblance to those of the body of a snake. It is the conjecture of Mr. Conybeare, by whom the first scientific investigation of the characters of this strange creature was made, that it breathed air and had frequent need of respiration, it generally swam upon or near the surface of the water, arching back its long neck, like the swan, and plunging it downwards at the fishes that passed within its reach. The greater length of its extremities would enable it to move on land with somewhat less difficulty than the Ichthyosaurus; and it might have very probably lurked in shallow water along the coast, where it could find shelter from its enemies, and a place of ambush from which to dart out its long neck upon its own prey. Its length seems generally to have been about ten feet.



Crocodile.

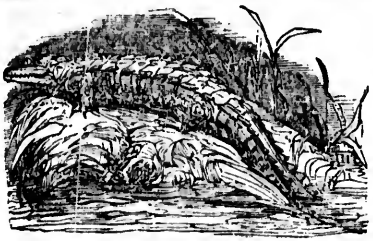
Order III.—Loricata.

The order Loricata, including the Crocodiles, Alligators, and Gavials, may be regarded as in many respects intermediate between the fresh-water Tortoises and the true Lizards. The body is enclosed in a sort of plate-armour, of which the separate portions are closely fitted together, and are capable of great resistance. Another character by which they are distinguished is the flattening of the foot, which is furnished with a kind of web between the toes, like that of the Emydæ: in the true lizards no such provision for aquatic habits is found. This order includes the most bulky reptiles at present known to exist. Some of them attain the length of thirty feet, and a circumference of seven or eight; so that, with the exception of the elephant, the rhinoceros, and the hippopotamus, there is no terrestrial animal exceeding these dimensions.

Although capable of moving on land, however, the greater number of them prefer the water, and show their chief activity in it. Besides the expansion of the foot, they are adapted for swimming by the lateral compression of the tail, which thus acts as a large and powerful fin. The crocodiles and their allies are all inhabitants of the rivers and fresh waters of warm climates; and they are all purely carnivorous. They destroy their prey by holding it beneath the surface of the water until it is drowned; the position of their nostrils, and the arrangement of the air-passages, being such that they are themselves enabled to breathe during the process. They cannot swallow under water, however, and their habit is to hide their prey in holes on the bank, until it has become putrid, and then to devour it at their leisure.

The conformation of the neck is such, that the head cannot be moved very far from side to side, though its play in the vertical direction is not limited. The animal finds it difficult, therefore, to turn itself round upon land; and thus a sure means of escape presents itself in those rare cases in which it leaves the water in pursuit of human prey. The tail, however, is very flexible from side to side, and is of great importance in propulsion. It also serves as an important weapon, for it is armed, like the back, with very strong upright plates, which form sharp ridges or crests in their centre; with this weapon the crocodiles can inflict terrific wounds upon their enemies. This group is entirely confined to the countries bordering on the equator. The animals which compose it may be considered in three subdivisions—the *Crocodiles*, chiefly inhabiting the Nile and other African rivers; the *Gavials*, found in the Ganges and other Asiatic rivers; and the *Caymans* or *Alligators*, confined to the New World.

The characteristic differences of these three divisions are best marked in the form of the head. The *Gavials*



Alligator.

have the muzzle exceedingly prolonged and narrow, somewhat resembling in form the beak of the spoonbill. In the true *Crocodiles* it gradually widens from the point towards the eyes; and in the *Caymans* the snout is much more rounded, and the head is broader in proportion to its length. These last appear less adapted to aquatic habits than the Crocodiles and Gavials, for the feet are not webbed to nearly the same extent as in the latter, and the ridge which increases the surface of their hind legs is wanting in the Alligators. With these exceptions, however, the general conformation of all, as well as their mode of life, is very similar.

Order IV.—Sauria.

The order Sauria comprehends all the animals commonly known as Lizards. They are intermediate between the Loricata and Serpents, for they have a lengthened body, terminating in a tail, like the former; but this, instead of being enclosed in large shields or plates, is covered with small scales, as in the latter. Moreover, they have usually four legs; but in some species one pair disappears, and in others they are all concealed beneath the skin, so that the body presents a snake-like aspect. In this group are found some of the most active, and certainly the most beautiful, of the Reptile class. Many of them are tinctured with the most brilliant colours, and as they are called into the greatest activity in the bright sunshine, nothing can surpass the splendour of their ever-changing hues. These colours bear an interesting relation to the habits of the animal, having a general resemblance to that of the places they frequent; thus tree-lizards are almost always of bright colours, in which green predominates; ground-lizards, brown, more or less speckled; and those which live in stony places are of a grayish hue.

The greater part of the Sauria are carnivorous, feeding upon other animals of inferior size and strength to themselves, and almost always preferring living prey. Many of them pursue nothing but insects; others lie in wait for small birds. The Iguanas, however, feed almost wholly upon vegetables. Many of them are possessed of very great agility upon land; some of them can ascend perpendicular walls, and even run along the ceiling with their backs downwards; none of them are inhabitants of the water, though a few occasionally resort to it. The activity of the smaller insectivorous lizards, when in pursuit of their food, is exceedingly curious and interesting. They watch with all the caution of a cat, and dart upon their prey with the quickness of lightning. Their movements are effected chiefly by means of their feet, and in the higher tribes exclusively so; but in those species in which the legs are short and the feet very small in proportion to the length of the body, progression is greatly assisted by the lateral motion of the trunk, which works its way along somewhat in the manner of that of the serpents.

The order Sauria may be subdivided into five families —1. The Lacertinidæ, characterized by the small head and thick neck, but particularly by the very long slender forked tongues of the animals composing it. This group includes the common lizards of this country, and most of the Saurians whose habits are peculiarly active. 2. The Iguanidæ, having the same general form, but short thick tongues. This group includes some of the largest of the Sauria, both recent and fossil. 3. The Geckotidæ, which are all nocturnal animals. These have not the attenuated form of the previous families, but are flattened, especially on the head. Their legs are short, and their movements comparatively tardy. Their colour is usually very sombre; and they are reputed, but without foundation, to be venomous. 4. The Chameleonidæ, whose tongue is of immense length, but obtuse at its point. The feet and tail are both peculiarly adapted for climbing; the former having two of the toes opposable to the rest, and the latter being round and prehensile. Their movements are very slow, except when the tongue is darted out to secure its insect prey. 5. The Scincoidæ, or Serpent-lizards, which are recognised by the shortness of the feet, the non-extensibility of the tongue, and the equality of the tile-like scales which cover the whole body and tail.

1. The Lacertinidæ are the most agile, most innocent, and most beautiful of the Saurians. Though they share, in common with the others, the dislike in which the animals of the class of reptiles are held by most persons, they never injure man, and are in some cases of considerable service to him. The larger ones live on the ground, usually preferring the shelter of underwood or of stones, and some frequenting marshy situations; whilst the smaller kinds resort to trees in search of their insect food, and, in the liveliness of their colours and the rapidity of their motions, bear no inconsiderable resemblance to birds. Two small species inhabit this country —the *lacerta agilis*, or sand-lizard, a beautiful little animal, which is sometimes of a brown and sometimes of a greenish hue; it is found on sandy heaths, and occasionally seen basking on the sunny sides of green banks. A more common one, however, is the *lacerta vivipara*, which inhabits most districts of England, and even extends into Scotland; it is also one of the few reptiles found in Ireland. It frequents heaths and banks, and may be seen on the watch for its insect prey, during the warm parts of the day, from the early spring until summer has far advanced. Its name is derived from a peculiarity which it shares with the viper—its eggs are retained and hatched within the body, so that the young are produced alive.

Some gigantic fossil bones have been discovered, which seem to be the remains of enormous Saurians, allied in structure to the Lacertidæ of the present time. From the proportional length of the head of one of these, which is nearly the sole part preserved, this lizard must have been at least seventy feet from head to tail.

2. The family of Iguanidæ approaches pretty closely to the true lizards in many of its general characters; but it contains several most extraordinary forms, widely differing from each other. The true Iguanas are confined to America; but some genera of this order are found over the greater part of the tropical zone.

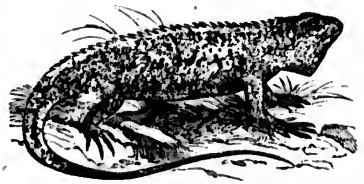
Flying Dragon.

Among these may be noticed the genus *Draco*, the animals included in which are distinguished at the first glance from all other saurians, by the possession of a pair of wing-like appendages to the sides of the body. These are formed by extensions of the skin, supported by the false ribs, which are greatly prolonged. They can be folded up or extended at the will of the animal, but they cannot be made to strike the air and to elevate the animal like a bird or bat. They serve rather as a kind of parachute, on which this little dragon, not many inches long, flutters from branch to branch in search of its insect prey; and also as a support to it when shooting, like the flying-squirrel, from tree to tree. These animals, the only living representatives of the fabulous dragons of the olden time, are found in the woods of tropical Africa and Asia, especially in the Indian archipelago.

This is perhaps the proper place to notice the very extraordinary fossil, to which the name *pterodactylus* has been given. In its general character it was certainly a lizard; but it seems to have been adapted to raise itself and fly in the air, like a bat or bird. The membrane of the wing was not extended, however, over the whole bony apparatus of the limb, but only one finger, which was enormously developed to support it. It is ranked by Cuvier among the most extraordinary of all the extinct animals that had come under his consideration; and the one which, if we saw them all restored to life, would appear most strange, and most unlike to any thing that exists in the present world. In the form of its head and the length of its neck, it resembled birds; but it had the bones and teeth of a lizard; its wings approached those of bats in form and proportion; and its body and tail resembled those of ordinary Mammalia.

In general external form, the pterodactyles probably most resembled a vampire bat; but in most of the species, the snout was elongated like that of a crocodile, and armed with conical teeth. Their eyes were of enormous size, apparently enabling them to fly by night. From their wings projected fingers, terminated by long hooks, like the curved claw on the thumb of the bat. These must have formed powerful members, with which the animals were enabled to climb, or creep, or suspend themselves from trees. With regard to their food, it has been conjectured that they preyed upon insects; and the number of fossil remains of insects in the strata in which they are found, proves that such a source of aliment was within their reach. The head and teeth of two species, however, are so much larger than would be required for the capture of insects, that they may have possibly fed on fishes (as there were at that epoch few or no small land animals), darting upon them from the air after the manner of many sea-birds.

From this account of the pterodactylus, it is evident that it is a most remarkable connecting link between the classes of birds and reptiles. That it is to be associated with the latter can scarcely be questioned; but if, as has been recently stated, the covering of the skin was more analogous to hairs or feathers than to scales, its affinity to birds must have been extremely strong.



Iguana.

The true Iguanas are confined to the New World, and frequently attain considerable size. They have a kind of spine or crest along the back, and a hanging pouch under the throat, which seems analogous to the dewlap of oxen; this pouch can be inflated, but under what circumstances is not exactly known. They have also in some degree that power of changing the hue of the skin, which is so remarkable in the chameleon. They are very agile, the legs being long in proportion to the body, and their food is almost exclusively vegetable. Some of them attain the length of five or six feet, of which the tail constitutes a large proportion. Their flesh is much esteemed as food; and, in the countries where they abound, they are sought for with this object. They are extremely tenacious of life. When attacked, they assume a formidable, though not a dangerous, aspect. They open their mouths, vibrate their tongues with rapid motion, inflate their throats, and erect their crests, while their eyes glance with great brilliancy. All this, however, is a demonstration for defence and not for attack. They are never known to combat with any animals but those of very small size.

Some gigantic fossil remains, allied in conformation to the Iguana, indicate the former existence of animals of similar character, which attained enormous bulk. The chief of these was the *iguanodon*, of whose bones fragments have been found in Tilgate Forest. The teeth are so precisely similar to those of the iguana in the principles of their construction, as to leave no doubt of the near connection of this gigantic saurian, which must have probably attained a length of at least seventy feet, with the herbivorous lizards of our own time. The examination of these teeth discloses some remarkable mechanical contrivances, adapting them to the function of cropping tough vegetable food, such as that afforded by the plants found imbedded with it.

The third family, the GECKOTIDÆ, consists of a large number of animals bearing a strong resemblance to each other in general characters. They are all nocturnal, and pass the day in obscure places; their eyes are large, and their pupil contracts under the influence of light, like that of cats, into a very small aperture. Their flattened form and broad head give to them a very striking and peculiarly disagreeable appearance, which is aided by their sombre and somewhat toad-like hue; hence, although timid and harmless, they are always regarded by the vulgar as having a venomous character, but without the least foundation in truth. Most of them possess claws at the extremities of the toes, and these are capable of being retracted like those of the Felinæ. They appear more useful to their possessor in climbing, however, than in securing their prey, which consists principally of insects. The Geckos are found in most warm countries in both hemispheres. They frequent buildings; and some species have a peculiar organization of the feet, by which they can climb smooth perpendicular walls, or even run beneath ceilings. They are often useful in clearing houses of musquitoes and spiders; but it is said that articles of food over which they have passed acquire poisonous properties, in consequence of an acrid exudation from the feet. It is difficult to know how much credit to give to such statements; equally positive ones, which are entirely destitute of foundation in fact, being circulated in this country in regard to the toad.

The CHAMELEONIDÆ, or *Chameleon* tribe, are few in number; but they present so many anomalies of organization, that it is necessary to separate them from all the other saurians, and to rank them as a distinct family. They are characterized, in the first place, by the structure of the feet, which are adapted for climbing, like those of the scansorial birds (such as the parrot), having two of the toes opposed to the other three. The tongue also affords a remarkable character; it is fleshy, and capable of enormous elongation; the extremity is thickened or club-shaped, and is furnished with a viscous secretion at its extremity. It is by this organ that the

chameleon entraps its insect food; for, by suddenly darting out the tongue, the insect is glued, as it were, to the end, and instantaneously conveyed to the mouth. This is the only part of the body that moves quickly; the

Chameleon.

limbs are often quite motionless for hours. When the chameleon walks, it advances with the greatest circumspection, and there seems a want of power to combine the actions of the different members. But when once attached to a branch or twig by the grasping of its feet, it seems to have little disposition to quit its hold.

The peculiar conformation of the eyes of the chameleon adds much to the general singularity of its aspect. They are large and prominent, but so much covered by the scaly skin of the orbits, that there only appears a small hole in the middle opposite the pupil. It is no uncommon thing to see the animal directing its eyes in two different ways at once; one eye looking forwards, for example, the other backwards, sideways, or upwards. This power must be very useful in compensating for the fixity of the body itself, so as to give information of the proximity of food in any direction. The powers of abstinence possessed by this singular race are very great, and hence most probably arose the fable of their living on air. They do not appear inclined to take food in confinement; and have yet been seen to shrink but little during many weeks of almost entire abstinence.

The chameleon has been most remarkable, however, for its power of changing colour, which was known to the ancients, and is commonly supposed to be peculiar to it; but, as already stated, other animals possess it in a greater or less degree. Much exaggeration has prevailed, as might be expected, in the descriptions of this phenomenon. All the colours of the rainbow, as well as white and black, have been represented to be assumed by it. Its natural hue, when at rest and in the shade, seems to be a bluish gray; from this it easily changes to a brownish gray or into a green. Sometimes the colour fades to a pale gray, and sometimes it deepens to a dark brown; but these are the extremes. The phenomenon has been variously accounted for. Of late, it has been generally supposed that the hue of the skin depends upon the degree in which the colour of the blood is combined with that peculiar to the membrane; and that it is altered by a change in the quantity of blood sent to the surface, which is increased by the distension of the lungs occasionally practised by this animal. But the recent inquiries of Milne-Edwards have shown that this is only a partial cause; and that the change is principally owing to an alteration in the relative position of two layers of colouring matter which the skin contains, so that they may be displayed singly or in various degrees of combination.

The last family of the Saurian Reptiles—the Scincidæ, or *Skink* tribe, conducts us so gradually towards the Serpents, that it is difficult to know where to draw the line of demarcation between them. They are recognised by the shortness of the feet, the roundness of the body, and the equality of the tile-like scales over the whole surface: their tongue is not capable of extension. They have all more or less of a snake-like form; and in some of them only two feet are developed. The true *scincus* probably approaches to the general saurian type more closely than the rest of the group. It is furnished with four short but strong feet, and runs with considerable agility. The *seps* has a more serpent-like body than the skink, and the feet are smaller and wider apart. These gradually become simpler in structure in various species; the number of toes being reduced, until the feet seem like simple hooks protruded from the body. The *chalcis* is another snake-bodied, small-legged saurian, which, in some peculiarities of its conformation, approaches a different group of serpents. In the *bipes*, the anterior pair of feet is not developed; and in the *chirotes*, the posterior pair is wanting. In both these, the general conformation of the body, and the habits, so far as known, correspond with those of the common blindworm, which is ranked among the Ophidia.

Order V.—Ophidia.

The animals composing this order are at once distinguished, not only from all other Reptiles, but from all other Vertebrata (except certain fishes of the *eel* kind), by the entire absence of members or appendages for locomotion. Although no trace of these is ever perceptible externally, there are some species bordering upon the saurians, in which rudimentary legs can be detected; and these approximate, therefore, towards the lizards in their own tribe, just as the two-legged, long-tailed lizards approach the serpents in theirs. Although apparently so different from other reptiles, Serpents are to be distinguished from lizards by little but the absence of extremities; since, in the possession of teeth, and in the scaly covering of their bodies, as well as in their general interior organization, they closely correspond with them. The elongated form of their bodies reminds us of the Worm tribe among the Articulata, which they may be regarded as representing among the Vertebrata, just as the class of birds represents that of insects; and they correspond with them in another very curious particular—the periodical exuviation of their skin. All serpents pass the coldest part of the year in a state of torpidity; and it is on emerging from this that they slough or cast their skin. This is first detached round the head, and is gradually pushed off by the animal, being turned inside out like the finger of a glove.

The progression of serpents on the surface of the land is accomplished in two ways; sometimes the whole body creeps along the ground, the scales on its under side serving (like the minute bristles of the earth-worm) as so many points of resistance to a backward movement, when the trunk is elongated, after being contracted; and sometimes it is bent upwards into a series of arches, by which the tail is brought near the head; and when these are straightened, the head is thereby projected forwards. In crawling along the ground, they are much assisted by the points of the ribs, which do not meet again in a sternum, but bear upon the ground, and serve as so many short feet, having a certain power of movement in themselves by means of the intercostal muscles. Most serpents can swim when placed in the water; and there is one group which is pre-eminently aquatic, and is distinguished by its vertically-flattened tail. So closely do the members of this group resemble certain species of the eel tribe, that it is not always easy to determine to which a specimen belongs, until its respiratory organs have been examined. The great flexibility of the body is partly due to the very large number of vertebræ (from 200 to 300) composing the spinal column, each of which is united to those before and behind it by a very beautiful ball-and-socket joint. A large group of serpents is distinguished by the possession of venomous teeth, or *poison fangs*, in addition to the ordinary teeth. These are sharp, long, and tubular; they are connected at their roots with a gland by which the poison is secreted; and

this is instilled into the wound through the tube in the tooth.

As in the case of other reptiles, we find that serpents only attain their full development in warm climates, having very little proper heat of their own. The species inhabiting the temperate zone are not nearly so remarkable, either for size, brilliancy of colour, or poisonous properties, as those which exist between the tropics. The order may be divided into five families. 1. The COLUBERIDÆ, consisting of the *Boas*, *Pythons*, *Colubers*, and other non-venomous snakes not belonging to the subsequent orders. 2. The CROTALIDÆ, containing the *Rattlesnake*, *Viper*, and all the venomous species. 3. The HYDROPHIDÆ, or *Water-Snakes*. 4. The AMPHISBÆNIDÆ, or *Double-walkers*. 5. The ANGUINIDÆ, or *Slow-worms*. These last approximate the Lizards, in the possession of rudimentary legs under the skin, as well as in other points of their organization.

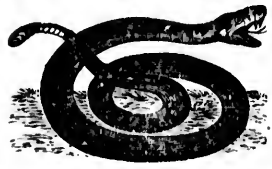
The COLUBERIDÆ are particularly distinguished by the power of dilating the opening of the jaws to an enormous extent, so as to permit of animals being swallowed which are much larger than the diameter of the serpent itself. This is accomplished by the separation of the jaw-bones into various pieces, which are very movable on one another and on the skull. The most remarkable species of this family, which is the most numerous of the order, are the *Boa Constrictors** of the New World and the *Pythons* of the Old; these, when full grown, attain the length of from thirty to forty feet, and

Boa Constrictor.

in thickness nearly equal a man's body. They do not fear to attack any animal; and, if they can once coil themselves round it, crush it by the enormous combined power of their muscles, in spite of all its means of resistance and defence. Their power is much increased by coiling the tail round a tree, so as to give a point of support from which the muscles may act more efficiently; and it is in this manner that they commonly wait for their prey. When they have seized and entirely destroyed it by crushing, in which process all the principal bones are broken, they begin to swallow it. This process lasts some time; and when it is complete, the position of the mass in the alimentary tube is at once known by the external protuberance. The process of digestion takes some days or even weeks for its performance, according to the size of the prey; and during that time the monster lies in a very inactive state, only issuing forth to seek a new victim when the digestion of the last has been for some time finished. The hair, horns, and other least digestible parts, are usually disgorged during the process. The Boas are distinguished from other serpents by the presence of two projecting bones near the vent, which are called *claspers*, and which may be regarded as the rudiments of posterior extremities.

* The name *Boa Constrictor* is commonly applied to the immense serpents of the East Indies; but only those of the western hemisphere possess the characters which the naturalist now assigns to the genus Boa.

The *Colubers*, strictly so called, are usually of comparatively small size; but their habits are the same in proportion. The common snake of England attacks small quadrupeds, frogs, birds, &c., in precisely the same manner that the boa seizes its larger victims. It is fond of marshy situations, and takes to the water readily, inflating its lungs so as to render itself buoyant. The flexibility of body, which is their means of obtaining support, is greater in the non-venomous serpents than in the Crotalidæ, which have another mode of procuring it. This is shown by suspending a coluber by its tail; it can bend its body so as to bring its head to the point at which it is held; this the venomous serpents cannot do. All the smaller species of this family are perfectly harmless to man, and may be handled without fear. Many of them are remarkable for the brilliancy of their colours, and others for the extreme regularity of their markings.



Rattlesnake.

The CROTALIDÆ, or *Venomous Serpents*, do not differ much in external characters from the preceding family; but the character of their teeth is quite sufficient to distinguish them. The poisonous properties of the different species vary considerably; in general they are more severe in the serpents of warm climates than in those of temperate regions. Cases of death from the bite of the British viper are very rare, and are generally to be attributed in part to some previously existing derangement of the system. There are many serpents in the torrid zone, however, whose bite is fatal to man and other large animals in a few hours, and to small animals much sooner.

European Viper.

This family contains two principal series—the *Rattlesnakes* and the *Vipers*. The former are generally regarded, but probably incorrectly, as the most venomous of all serpents. The rattle at the end of the tail, which is their distinguishing characteristic, is formed of several separate pieces of a dry horny substance, one of which is received within another. They are quite loose, and receive no nourishment after they are once formed. A new piece is said to be added every time the skin is cast, which usually takes place twice a year. The sound made by the rattle is not great in the ordinary motion of the serpent, and cannot be heard at more than two or three yards' distance. Several species of *Crotalus* are described, varying in length from four to eight feet. They are all natives of America. Their ordinary food consists of birds, squirrels, and other small animals. It was once supposed that they possessed the power of charming or fascinating these animals, so as to draw them by degrees to enter their throats. This is certainly an error; but it is equally certain that most animals are so terrified at the sight of the rattlesnake as to lose the power of escape and to become an easy prey when it darts upon them.

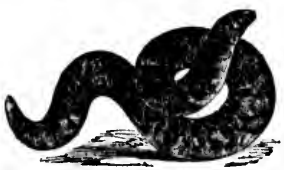
The *Vipers*, being destitute of the peculiar characteristic of the Rattlesnakes, are more like the Colubridæ their forms, however, are less elegant, their colours less

splendid, and their movements less active. In general, they are remarkable for the dark lurid tints of their covering. The most celebrated species of this group is the

Horned Viper.

cobra di capello or *spectacle-snake* of the East Indies. Its first name, given to it by the Portuguese, signifies hooded snake, and is derived from the power of dilating the skin behind the head, when irritated, so as to give the appearance of a hood or cowl. The common English appellation is bestowed in consequence of a mark, in the shape of a pair of spectacles, behind its head. This is one of the most deadly serpents of the East. An equally, if not still more, venomous snake, however, exists in some of the West Indian islands. The bite of the venomous serpents varies in its consequences according to the state of health of the bitten subject, the depth and number of the wounds, the time which has elapsed since the animal last made use of its fangs, and consequently the amount of poison which has penetrated into the system.

The HYDROPHIDÆ, or *Water-Serpents*, are comparatively few, and are limited in their geographical range. They are mostly found in the seas and rivers of the East Indies, and in some localities they are by no means uncommon. They are chiefly known by the very decided vertical compression of the tail and hinder part of the body, which may thus be compared to the tails of fishes; hence they swim with considerable facility, occasionally coming to the surface to respire. They possess poison-fangs, and are more dangerous than crocodiles or sharks to persons entering the water where they abound. One species exists in the rivers and canals of India, and attacks animals which come to bathe or drink, as well as devotees while performing their ablutions; others are confined to the sea, where they feed upon fish. It is stated that they will occasionally make their way into boats. Their colours are generally bright.



The Amphisbæna.

The AMPHISBÆNIDÆ, or *Double-Walkers*, are a still smaller group, intermediate in some respects between the true serpents and the slow-worms. They derive their name from the power of moving either backwards or forwards with equal facility. The two extremities of the body are so much alike, that they would not be distinguished by a superficial observer, the eyes being so very small as sometimes to appear wanting; the whole body is of nearly equal diameter. This group is restricted to the warmest parts of South America. Notwithstanding the common idea of its venomous properties, it is quite harmless, and subsists on ants and other small insects. It has not the power of separating the bones of the jaws, which distinguishes the true serpents.

The ANGUINIDÆ may almost be called either lizards or serpents, so remarkably do they combine the characters of the two orders. In one species the rudiments of hind legs form a visible projection near the vent; and in another the anterior ribs are connected by a cartilage, which is the rudiment of a sternum. The common *slow-worm* or *blind-worm* of this country has received its second name from the supposed absence of eyes; this is an absurd error, however, as the eyes, though small, are very brilliant. It is a perfectly harmless animal, feeding on insects, slugs, &c. It is said to swallow frogs, birds, and mice; but this is impos as the bones of its jaw do not separate in the middle, d its swallow is consequently small and not dilatable. When alarmed, it throws the whole of its muscles into contraction in a peculiar manner, and is then very brittle, so that it frequently loses its tail by various accidents; in the course of a year, however, this member is replaced. There is a larger species of this family existing in America, which attains the length of two feet, and from its extreme fragility is called the *glass-serpent*.

The Serpents are connected with the Amphibia by the curious genus *Cæcilia*, or naked serpent, which will be described as a member of that class.

CLASS IV.—AMPHIBIA.

The animals composing the class Amphibia were included by Cuvier and many other zoologists under the general designation of Reptiles. There seems, however, sufficient reason for separating them into a distinct group of equal rank. They may be regarded as intermediate in their structure, and in their habits and mode of life, as well as in many of their forms, between Fishes and true Reptiles; and they bear a still more remarkable relation to these classes, in that change which many of them undergo at a certain period of life, by which they become transformed from the nature and habits of the former to those of the latter class, by a metamorphosis analogous to that of insects.

The class we are now considering offers us the only instances of animals possessing two sets of respiratory organs, one adapted to breathe air and the other to aerate the blood by exposing it to water. In most of the species composing it, lungs and gills do not exist at the same time, at least in a state of activity; the latter gradually disappearing as the former are developed. But in a few species the gills are retained during the whole of life, even after the lungs are capable of aerating the blood. These are, then, the only true amphibious animals; but the term AMPHIBIA may be very properly applied to all such as undergo this kind of metamorphosis, breathing by gills alone at the commencement of life, and afterwards acquiring lungs by which air can be respired.

The general peculiarities of the Amphibia may be thus stated:—Like fishes and reptiles, between which they are intermediate, they are oviparous and cold-blooded, but their skin is soft and naked, being destitute of scales or plates. Most of them undergo a metamorphosis which has reference to a change of condition, from the form of a water-breathing fish to an air-breathing reptile; and, when they have attained their perfect condition, they closely resemble true reptiles in general character. In many species, however, little change is seen from the time that the animal emerges from the egg to its adult age. With the exception of the frogs, they have much the form of lizards (among which several of them were formerly classed), and have generally four feet and a lengthened tail.

The class, which contains but a small number of different genera, may be best subdivided into orders chiefly according to the degree to which the metamorphosis proceeds. Thus, in the first, ANOURA, embracing the *Frogs* and *Toads*, the gills are entirely lost in the

fect state, and the tail also disappears. In the Urodela, including the *Salamanders*, *Water-Newts*, &c., the gills disappear in the perfect state, but the tail is retained. The Amphipneusta, to which the *Proteus* and *Siren* belong, retain their gills during the whole of life; the tail continues to form a large part of the body, and in some instances only two legs are developed. In the Abranchia, an order which consists only of two little-known genera, no gills have been found at any period of life, but the body and tail are evidently formed for swimming. And in the Acoua, including only one genus, the *Cæcilia*, the body is altogether destitute of feet, and has a serpent-like form.

Order I.—Anoura.

The principal subdivisions of the first order are the Ranidæ, or *Frog* tribe, and the Bufoidæ, or *Toad* tribe. The former frequent water, and are adapted for swimming in it; the latter are usually found at a distance from water, and are much less adapted for active movements of any kind. The metamorphosis of both these is attended with the same general phenomena; and as the animals themselves are so well known, a description of this process will be a sufficient account of those which inhabit Britain. It is one very easily observed, for, by obtaining a little water containing young tadpoles, the whole process may be made to go on under our eyes, and the young naturalist is earnestly recommended to watch it for himself.

The spawn, soon after its deposition in pools, consists of a transparent gelatinous mass, enveloping a number of little black dots, which are regularly distributed through it, and which are the eggs. Those are abundantly found in stagnant pools in the month of April, being usually deposited (in this country) at the end of March, and hatched about a month afterwards. When the tadpole first emerges, it is seen to present, in every respect, the appearance of a fish. It has a large oval head, and an elongated tail, flattened vertically, by the vibrations of which it swims actively through the water. The gills are found hanging in tufts on each side of the head; and, if examined with a microscope, the motion of the blood through them may be very beautifully seen. The circulation may be observed, also, with great facility, in the fin-like expansion on the upper and under edge of the tail. Very soon, however, the gills are withdrawn, as it were, into the head, being covered over by a fold of skin, analogous to the operculum, or gill-plate of fishes. The little creature, which at first seemed to derive its subsistence from the fluid absorbed within the body and on its surface, now seeks its food amidst softened or decomposing vegetable matter; and, to give greater power of movement, the surface of the tail is considerably increased.

The tadpole now undergoes but little change in its external form for a considerable time, but increases rapidly in bulk. The first appearance of limbs is seen in a little tubercle or knob which projects at the back of the head: this is the rudiment of the hind leg. It soon acquires somewhat the form of the perfect limb, the toes budding, as it were, at the extremity; but it still continues very short, even in proportion to the diminutive size of the animal. Meanwhile, the fore legs are also budding out in the same manner, and gradually assume their distinct and ultimate form. During this process, the development of the body goes on at the expense of the tail, which is gradually removed by absorption, so that the hinder part of the body becomes rounded. The gills disappear by a similar process.

The little animal has now undergone its complete development, and having, at the same time, become capable of respiring air by true lungs, and of moving freely on land by means of its hinder legs, it comes to the shore to feed on small insects and worms,

Frog.

which are henceforward to constitute its nutriment. Such multitudes of these newly perfected little beings are often found in damp weather enjoying their new scene of existence, as to have given rise to many stories of showers of frogs having descended from the sky, which are still believed in some parts of the country. They now grow with great rapidity during the remainder of the year; but on the approach of winter they retire to the mud at the bottom of the water, where they congregate in large masses, remaining torpid until the return of spring.

The Bufoidæ, or *Toads*, are a perfectly harmless and inoffensive race, although certainly not inviting in their general aspect. The idea of their venomous character is altogether unfounded. The body is of a dull hue, its shape awkward, and its movements appear difficult, but it is by no means deserving of that disgust which it has inspired in some naturalists as well as in the popular mind. Unpossessed of any power of active defence, or of rapid escape from its enemies, the dullness of its colour serves to shield it from observation. Its eye bears a remarkable expression of mildness and patient endurance, rather fitted to excite pity and compassion than disgust or repugnance. It issues forth from its concealment at twilight in search of food; and this consists of insects, worms, slugs, &c., the inordinate increase of which it is very useful in repressing. It seems to prefer that which is actually alive and in motion. When about to feed, it remains motionless, with its eyes turned directly forwards upon the object, and the head inclined towards it; and in this attitude it remains until the animal moves, when, by a stroke like lightning, the tongue is thrown forward upon the victim, which is instantly drawn into the mouth. So rapid is this movement, that it requires some little practice, as well as close observation, to distinguish the different motions of the tongue. This organ is folded back upon itself, as in the frog; and the under surface of the tip is imbued with a viscid mucous secretion, which adheres to the prey. This is generally swallowed alive; and its motion within the stomach may often be perceived for some time afterwards.

The toad, like the rest of the Amphibia, becomes torpid in winter; but, instead of returning to the water, like the frog, it chooses for its retreat some retired and sheltered hole, or a space among large stones. Like the other Amphibia, too, it is endowed with great tenacity of life, and can exist for a very long time deprived of food and almost of air. The knowledge of this fact has occasioned a disposition to give too ready credence to the various wonderful accounts which have been circulated, at different times, of toads being found alive, completely enclosed in solid rock or in the heart of trees. It is not at all unlikely that a toad which has retired to a hollow in a tree in the autumn, may find itself so far enclosed in the spring as to be unable to escape; and that, through the opening, it may obtain the requisite supply of air, and even of food. In process of time new wood may be deposited around it, so that the cavity shall be completely moulded upon its body; and the opening will be gradually diminished. Still, a very small aperture will be sufficient to admit air, moisture, and minute insects, by which it may be supported for many years, being a long-lived animal; and in none of the cases on record does there seem to have been such a minute examination of the cavity as to disprove the idea that a connection with the external air still existed. In a similar manner it is fair to explain most of the accounts of toads found in stones, &c.

Order II.—Urodela.

The animals of the order Urodela bear so strong a general resemblance to lizards, that they were united with that group by Linnæus, and are still popularly regarded as such. The *Salamanders* and their allies, however, are easily distinguished by the smoothness and softness of their skin, which is entirely destitute of those scales which all lizards possess. Moreover, they undergo a metamorphosis similar to that of the frogs, except that the change of form does not proceed to the same extent. Like the Anoura, this order may be subdivided into two families, of which one, that of the TRITONS, is of aquatic habits even in the adult state, like the frogs; while the other, that of the true SALAMANDERS, bears more analogy with the toads in its aspect and habits.

Of the TRITONS several species exist in this country, and are known under the names of *Evat*, *Eft*, *Newt*, &c. The largest is about six inches in length: it is not at all uncommon in ponds and large ditches, where it lives upon aquatic insects and other small living animals: it even devours the smaller species of newt. The eggs are laid in the spring, upon aquatic leaves, which are folded together by the animal; and the young tadpole, when it comes forth, bears considerable resemblance to [illegible] of the frog. The gills, however, are in larger tufts, and they afford a most advantageous opportunity for observing the circulation. The anterior legs are the first developed; and even after they have arrived at nearly their full growth, the gills are very large, and actively performing their functions. The lungs are, however, gradually developed; and, towards the end of autumn, the gills are absorbed, and the animal breathes air only. Still it does not quit the water, but remains an inhabitant of that element, coming occasionally to the surface to breathe.

The *Salamander* is a land animal, of the same general character with the water-newt, but possessing a rounded instead of a flattened tail, and a surface somewhat warty, like that of the toad. It discharges, when alarmed, an acrid secretion from the tubercles in the skin, which is said to be poisonous to small animals. In other respects it is quite harmless, and is not possessed of any remarkable properties. The eggs of the salamander are hatched within the body, so that the young are produced alive, and the progress of the metamorphosis has been considerable before it sees the light. Nevertheless, it at first inhabits the water, and, when it has finally quitted it, frequents damp in preference to dry situations. No species exists in Britain, but the salamanders are pretty extensively diffused over other parts of the globe.

Order III.—Amphipneurta.

The animals belonging to the order Amphipneurta exactly resemble salamanders, the development of which has been checked just at the period of their transformation from aquatic to air-breathing animals. They retain their gills during their whole life, and acquire lungs in addition, by the partial metamorphosis they undergo. The legs bear but a very small proportion in their degree of development to the tail; and in some instances only one pair is formed. The first-discovered animal of this order was the *proteus*, an inhabitant of the underground lakes of Carniola and Styria, and of the passages between them. So strongly does this resemble the larva of a salamander, that it was at first believed by naturalists to be such; and it was only after the discovery of others of the same character, that its true nature was understood. Unlike most other animals, it appears to suffer injuriously from light; for not only does it prefer dark places, but even dies if it be exposed to open day for any length of time without the power of hiding itself. The siren is an animal of similar character, inhabiting the North American rivers, where it feeds upon earth-worms, aquatic insects, &c., in search of which it burrows in the mud. Only the anterior pair of feet is developed, and there is no rudiment of the other. The body has very much the form of that of the eel; and sometimes it attains the length of three feet.

Order IV.—Abranchia.

The order Abranchia contains only two genera, and these both peculiar to North America, the *menopoma* and the *amphiuma*. They are not known to undergo any metamorphosis, but breathe by lungs during the whole period of life, and have never been seen destitute of legs. These are, however, very short, and seem almost useless appendages to the body, which is shaped like that of an eel. It is not improbable that, as in the salamander, the egg may be hatched within the body of the parent, and that the young may not come forth until it has passed through its tadpole state.

Order V.—Apoda.

The order Apoda contains but one genus, the *Cæcilia*, blind-newt, or naked serpent. This was placed by Cuvier among the Serpents, from the snake-like form of the body, which is destitute of any rudiment of legs. But, in the absence of scales on the skin, as well as many anatomical characters, it rather corresponds with the Amphibia, forming, however, a most interesting transition to the next class. It is not known to undergo any metamorphosis. Its name was conferred by Linnæus on account of its supposed blindness. The eyes are exceedingly small, and are nearly hidden under the skin, and it is believed that, in some species, these organs are altogether wanting. These animals frequent the rivers and marshy grounds of many tropical countries: further information in regard to them is much needed. They are said to burrow in the ground, and to live very much in the manner of earth-worms. As far as is known, they are perfectly harmless.

From this sketch of the class AMPHIBIA, it will be seen that, in a scientific point of view, it is one of the most interesting in the whole animal kingdom. Though of little direct benefit to man, it is certainly as harmless as any tribe. And thus, although the forms of many of the species offend against our notions of beauty, and their love-songs give them the character of "horrible musicians," the aversion and prejudice with which they are ordinarily regarded would be justly replaced by the pleasure of intelligent curiosity.

CLASS V.—FISHES.

The animals of this class are the only Vertebrata which, in their adult state, are formed for respiring beneath the surface of the water they inhabit. The whale tribe, which so much resemble them in external aspect and in mode of life, are all air-breathing animals, and they are as certainly drowned by being prevented from taking in air at the surface, as are any species which ordinarily live on land, though, by their peculiar conformation, they are enabled to sustain the want of it for a longer time. The same is true of frogs, salamanders, and other reptiles, which pass a large part of their time under water. But with fishes, the reverse is the case. In these, as in the Mollusca, the blood receives its necessary purification by being exposed to the air contained in the surrounding fluid. This is done by its transmission to a series of delicate filaments, constituting the *gills*, each of which consists of two minute blood-vessels (one to convey the blood from the heart and the other to return it) enclosed in a delicate membrane, through which the chemical changes between the blood and the air take place. But these filaments do not hang loosely in the water, as in the greater part of the Mollusca. They are attached to bony or cartilaginous arches, which are arranged in pairs behind the head, and are more or less

protected by a special covering; and there is a provision which ensures a proper change of the fluid in contact with them. The cavity in which they lie is connected with that of the mouth, and water is constantly taken in by that opening, and forced by muscular action over the surface of the branchiæ or gills, passing off through the apertures which are seen behind the head.

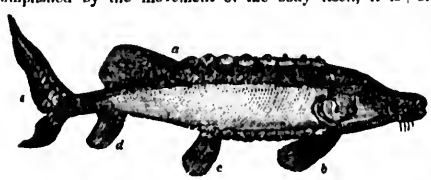
The quantity of air contained in water is very minute, and if the fish have need of a larger supply, it takes it in at the surface from the atmosphere. This is often seen in the summer, when the increased temperature renders the organic functions more active, and occasions a greater demand for air. It may also be seen when the quantity of water is limited, so that all the air is soon exhausted from it. Fishes that are kept in such water, and are prevented from coming to the surface, are *drowned* as truly as an air-breathing animal would be under similar circumstances. Hence the desirableness of frequently changing the water in which gold-fish are kept, and of exposing as large a surface of it as possible to the atmosphere, that absorption from it may supply the air removed by the animal. The death of a fish out of water is attributable chiefly to the clogging together of the filaments of the gills, so that the air cannot act upon them, and the drying up of those which, being at the surface, are in contact with the air. Hence, if the branchial arches are kept separate, and their filaments be preserved in a moist state, respiration will go on. There are some fishes in which this is naturally effected by a peculiar contrivance, and in others it may be artificially accomplished.

But there is another way in which the atmosphere acts injuriously upon fishes. Not only from the gills, but from the whole surface of the body, a very rapid evaporation of fluid takes place in dry air; so that the weight diminishes considerably, and the tissues are incapable of performing their proper functions. Hence, if it be desired to keep fishes alive in air as long as possible, they should be surrounded by moist grass, or some other substance which will effectually saturate with dampness the air in their neighbourhood.

Whilst the respiratory organs of fishes immediately indicate their adaptation to pass the whole of their lives in the water, the conformation of almost all of them exhibits an adaptation to rapid and energetic movement in that element. The form of the body is such as to oppose the least resistance to progression, while it is also such as to confer great propelling power. It is usually flattened in a vertical direction; and the surface is extended by a finny prolongation of the spine above, and of corresponding rays below, and by the expansion of the tail in the same line. In this manner, a very large lateral surface is produced, while the resistance to forward movement is very small. The propulsion of the fish is chiefly effected by the movement of the whole body and tail from side to side, which operates in precisely the same manner as the oar of the sculler; and this is facilitated by the great flexibility of the spine, the bones of which are so united together as to move with the slightest possible effort.

But though the propulsion of the fish is chiefly accomplished by the movement of the body itself, it is usually aided by lateral fins, which answer to the legs and arms or wings of higher Vertebrata. Besides the fins which have been already spoken of as existing on the central line of the body, above and below (of which the one running along the back is called the *dorsal* fin and the one under the body the *anal*), there are generally found two *pairs*, of which one, corresponding to the anterior extremities of other Vertebrata, is always situated near the head, and is called the *pectoral*; while the position of the other, corresponding with the posterior extremities of land animals, and called the *ventral*, is extremely variable. Sometimes the ventral fins are placed far back, in the usual position of hind legs; and sometimes they are fixed far forwards, even anteriorly to the pectoral. The pectoral fins are usually connected more intimately with the spinal column than the ventral. These fins are composed of a membrane stretched over a set of bony or cartilaginous rays, which may be regarded as representing the bones of the hand or foot. The bones which connect them with the spine are very short, and are hidden under the flesh; so that the chief movement of the fins is, as it were, at the wrist and ankle joints. It is chiefly by their vibrations that the animal is raised or depressed in the water, and they also assist in changing its direction from side to side. The forward position of the ventral fins is chiefly noticed in those species whose habits involve a considerable variation of their depth in water. Sometimes one, and sometimes both pairs of these fins are absent; in the latter case the fish is said to be *apodal* or footless. In other instances the pectoral fins are enormously developed, like the wings of birds, and even enable the animal to rise out of the water and to skim for a short time along its surface.

The *swimming-bladder* is an organ usually supposed to be peculiar to this class. In the highest forms in which it exists, however, its correspondence with the lungs of air-breathing animals is very evident; and there is little doubt that air is taken into it from without, for the purpose of respiration. In its lower or rudimentary condition, however, its office is more doubtful, especially where it is entirely closed. It is usually believed to contain air, and to serve as a means of regulating the specific gravity of the animal, the swimming-bladder being compressed when the fish desires to sink, and allowed to expand when it desires to rise. In this manner it would seem that gold-fishes are enabled to ascend and descend in the water, without any muscular effort visible to those who watch them. But it is remarkable that this organ is sometimes absent in a species nearly allied to one in which it is present; and that the want of it does not seem to make any difference in its powers. As a general rule, it is more constantly present in river fishes than in the inhabitants of the sea; and it is most frequently absent in those which live habitually near the bottom of the water.



Fish.

a dorsal fin; *b*, pectoral fin of one side; *c*, ventral fins, *d*, anal fin; *e*, caudal fin, or tail.

The surface of the body is generally covered with numerous scales, which vary considerably in form and size in different species. Each scale is composed of several plates, of which every one extends on all sides beyond the one on its exterior; hence the appearance of numerous concentric lines on all sides, which mark the stages of growth, the larger plates being the latest formed. They thus resemble the shells of mollusca in their mode of increase. Each scale is attached to the skin of the fish by its anterior edge, which is covered by those in front of it, whilst its posterior edge overlaps the scales behind it. This arrangement is not universal, however; for the scaly covering is sometimes formed by a series of bony or even enamel plates, united to each other by their entire edges. Such an arrangement was very common in the fishes existing at the time of the coal formation, but is now much more rare.

When we consider that more than two-thirds of the

earth's surface is covered with water, often to a very great depth, and that, as far as is known, the whole of this element is habitable by fishes (each stratum having some particular species formed to exist in it), little doubt can be entertained that they form the most numerous class of vertebrated animals. Their numbers are kept up by their extreme fertility. The cod-fish has been ascertained to lay not much fewer than four millions of eggs at a single deposit; and in other species the number may even be greater. Their voracity is also extreme. Almost all of them are adapted to devour and digest animal food, some of them living chiefly on crustaces, molluscs, and other invertebrate inhabitants of the ocean; and others having it for their especial function to keep down the inordinate multiplication of their own kind. Some of these attain a considerable size. The pike has been found nineteen feet long; and there is evidence of one having lived for 267 years. The sun-fish has reached the length of twenty-five feet; and some rays and sharks have exceeded forty feet.

The classification of Fishes proposed by Cuvier is probably the best that, in the present state of our knowledge of this group, can be adopted. It is obvious that, from the peculiarities of the habitation of these animals, and the very imperfect manner in which the depths of the ocean, over a large part of the earth's surface, have yet been explored, a great number of existing species probably yet remain to be discovered. And it is also certain that the number of species formerly existing in the waters, and of which we have at present but very scanty remains, was considerable, and that their forms often differed widely from those familiar to us. Hence, when these shall have been more completely investigated, it is not improbable that this classification must be greatly modified in order to include them.

The primary division of the class is into the *Osseous* and *Cartilaginous* Fishes, the former having a hard bony skeleton, and the latter having one of less firm consistence, possessing but little calcareous matter. The former group is divided into six orders, which are principally characterized by the structure and arrangement of the fin rays. These are distinguished as either consisting of a single piece—in which case, whether stiff or flexible, they are said to be *spinous*—or as consisting of a number of jointed pieces, divided at their extremities, when they are called *soft* or *articulated*.

1. Acanthopterygii, or *spiny-finned*. In this order, which contains the greatest number of ordinary fishes, there are spinous rays in the first or anterior part of the dorsal fin, and sometimes these have no connecting membrane. The anal fin has also its first rays spinous, and there is generally one such ray in the ventral.

The three next orders are all *soft* or *jointed-finned*, and come, therefore, under the general designation Malacopterygii. They are distinguished from each other by the position or absence of the ventral fins.

2. Malacopterygii Abdominales. In these, the ventral fins are attached to the abdomen behind the pectorals. They are a very numerous order, and include the greater part of the fresh-water fishes.

3. Malacopterygii Sub-Brachiati. In this order the ventral fins are brought forwards under the pectorals, and the fish, which are chiefly marine, enjoy a considerable power of ascending and descending in the water.

4. Malacopterygii Apoda. These are fishes in which the ventral fins are always wanting, as are not unfrequently the pectoral also.

The two remaining orders of Osseous Fishes are separated from the rest by other peculiarities.

5. Lophobranchii (Tuft-Gilled). In these, the gills, instead of hanging in regular fringes, like the teeth of a comb, from the branchial arches, are disposed in tufts, and the gill-covers open less freely than in the preceding orders.

6. Plectognathi. The members of this order, though retaining many of the characters of the Osseous Fishes, exhibit an evident transition to the Cartilaginous, both in the less complete ossification of the skeleton, and by the union of the bones of the upper jaw to each other and to the head. The opening of the gill-covers is still smaller than in the last order.

The *Chondropterygii*, or Cartilaginous Fishes, cannot be considered either superior or inferior to the others, but form, as it were, a parallel series with them. Some tribes exhibit the lowest organization which exists in the class, while others present many points of affinity to Reptiles. The different parts of the skeleton, which, in the Osseous Fishes, are united by distinct joints, here frequently form one continuous piece. This is most remarkable in the head, which is composed of a single piece, in which, however, the principal parts found in the bony fishes may be distinguished by various ridges, furrows, and holes. This group contains three orders, distinguished from each other by the conformation of the mouth and the arrangement of the gills.

7. Chondropterygii Branchiis Liberis (Free-Gilled Cartilaginous Fishes). In these, consisting chiefly of the Sturgeons, the gills hang freely, and are covered with a gill-lid having a single wide opening, as in Osseous Fishes.

In the other two, the gills are attached at the outer edge, and there is a separate opening for the escape of the water that passes over each arch. These, which are termed Chondropterygii Branchiis Fixis, or Fixed-Gilled Cartilaginous Fishes, are distinguished from each other by the conformation of the mouth.

8. Selacii, or *Sharks* and *Rays*. Here the jaws are not united into a ring.

9. Cyclostomi (Round-Mouthed). These have a round fleshy lip, by which they adhere to their prey, obtaining their food by suction, and this is supported by a cartilaginous ring, formed by the union of the jawbones. It is in the fishes of this order that we find the vertebrated structure in its lowest form.

Division 1.—Osseous Fishes.

Order I.—Acanthopterygii.

The Spiny-finned Fishes are divided by Cuvier into fifteen families, the most important of which will now be noticed.

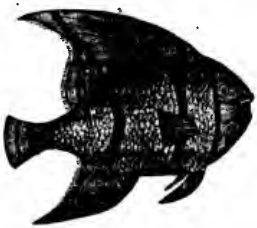
Perch.

Percidæ, the *Perch* tribe. These are very numerous in the waters of all warm climates, some species inhabiting the rivers, and others the open sea. Their bodies are oblong, and covered with hard or rough scales; and the gill-covers are toothed at the margin. They are mostly *thoracic*, or have the ventral fins under the pectoral. Some, however, are *jugular*: that is, have the ventral fens placed upon the throat, farther forwards than the pectorals; and some are *abdominal*. Their teeth are very minute, and set close together in numerous rows. Their flesh is in general agreeable and wholesome. This family includes all the fish known as Perches, of which some species are found in almost all the rivers in the world, and a large number of marine fishes used as food on different shores.

Triglidæ, the *Gurnard* tribe. These bear a general resemblance to the Perches; but have the head peculiarly armed with spines or hard scaly plates. In several species the pectoral fins are very much extended; but in

Dolphin.

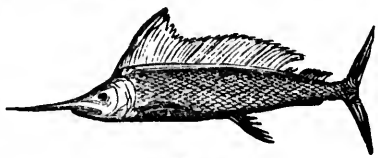
none except the flying-fish are they sufficiently powerful to raise the animal out of the water. Many species of this tribe are found in the temperate seas. The most interesting of all is the *dactylopterus*, or *flying-fish*. This has a kind of supplementary pectoral fin on each side, formed of a membrane stretched over finger-like processes, which in the gurnards are unconnected. By the impulse of these on the surface of the water, the flying-fish can raise themselves to the height of several feet into the air, and can suspend themselves above the surface for a few seconds, often skimming lightly over it for a considerable distance; but they cannot sustain themselves in the atmosphere for any length of time. They are gregarious fish; and it is when a shoal of them is chased by the *coryphæna* (commonly but erroneously termed *dolphin*) or some similar enemy, that the most remarkable leaps are taken. They not unfrequently fall upon the deck of a large vessel that may be passing among them. The finger-like processes are usually prolonged beyond the fins, and appear to possess an amount of sensibility unusual in such parts.



Chætodon.

The family SQUAMIPENNES is so named because the soft and even the spinous parts of their dorsal fins are so covered with scales as not to be distinguished from the rest of their bodies. The most interesting genus is the *Chætodon*, of which several species, remarkable for the beauty of their colours, abound in tropical seas. One of these, the *C. rostratus*, which has a very prolonged snout, has the faculty of shooting insects with drops of water projected from the mouth, and it then seizes them as they fall. This power is the more extraordinary, as, according to the laws of the refraction of light, the place of the insect will appear to the fish different from the reality, the rays passing from a rarer to a denser medium; and the drop must not, therefore, be projected in the line in which the insect *appears* to be, but somewhat below it. This little fish, which is a native of India, is often kept in glass vases by the residents there, as gold-fish are in this country, for the purpose of affording amusement by its dexterity.

The next family, SCOMBERIDÆ, or the *Mackerel* tribe, is one of very great importance to man. It comprises a large number of genera, a vast collection of species, and numberless individuals. The aspect of the common *mackerel*, with its spindle-shaped, beautifully-coloured, smooth, and small-scaled body, is well known. It very rapidly dies out of water, and soon becomes tainted. Mackerel has been supposed to be a migratory fish, on account of its appearing on our shores in immense shoals at particular epochs. But it may be caught all the year round on our coasts, which shows that it does not wholly desert them, as is done by the really migrating tribes. The fact is, that it passes most of the year in the open sea, and that its object in approaching the shore is to deposit its spawn; after which, those that have escaped being entrapped by the ingenuity of man, return to their former quarters. The extent and importance of the mackerel-fishery of Britain, especially in the south and east, are well known. The *tunny* is an allied species, attaining a much greater size, and also valuable as an article of food. This frequents the Mediterranean, and is occasionally seen on our own shores. It sometimes attains the length of fifteen or even eighteen feet. To this order belongs also the *xiphias*, or *sword-fish*, distinguished by its long pointed beak. This



Sword-Fish.

is a most powerful offensive weapon, and with it this fish attacks the largest inhabitants of the ocean. By its high dorsal fin, and expanded tail, it is able to impel itself forwards with great force; and when attacking a large animal, it makes a violent dart against it, quite transfixing it with its sword. It has been known in this manner to drive its beak into the timbers of a ship, and, not being able to withdraw it, to break it off and leave it. The sword-fish abounds in the Mediterranean, but is less frequent in the Atlantic. It is very palatable as food; and often attains the length of fifteen feet. The *dory*, of which one species is highly prized by epicures, is another fish of the same family. It is remarkable for the filamentary prolongations from its dorsal fins. And lastly may be mentioned the *coryphæna*, commonly known as the *dolphin*. This is a large and splendidly coloured fish, which darts through the water like a radiant meteor, exhibiting an extraordinary play of colours when brilliantly illuminated. It has long been celebrated for its change of colour when dying. It swims with great rapidity, and is very voracious, committing great havoc among the flying-fish and others of like size. The influence of light on the colour of animals is remarkably shown in the far superior brightness of the Indian *Scomberidæ*, when contrasted with the blackish hue of those of northern seas.

The fishes of the family PHARYNGINÆ LABYRINTHIFORMES, are characterized by a very peculiar structure, from which they derive their designation. The membranes of the pharynx (or back of the mouth) are divided into small irregular leaves, containing cells among them, which the fish can at pleasure fill with water; and, by ejecting a portion of this water, it moistens its gills, and may thus continue its respiration out of its proper element. By means of this apparatus, which resembles that possessed by the land-crabs, these fishes are enabled to quit the pool or rivulet which constitutes their usual element, and move to a considerable distance over land. Such a provision is especially desirable in tropical climates, where shallow lakes are often dried up by a continued drought, and their inhabitants must perish if not enabled to migrate. The people of India, who often witness the appearance of these fishes where they were known not to exist, believe that they fall from heaven. Some of them are able not only to traverse plane grounds, but can climb steep banks or even trees in the course of

their journeys. Of these the most curious is the *anabas*, commonly known as the *climbing-perch* of Tanquebar, which climbs bushes and trees in search of its prey, a species of land-crab, by means of the spines on its back and gill-covers.

The members of the family Gobiidæ, or *Goby* tribe, are known by the thinness and flexibility of their dorsal spines. Many of them are remarkable for producing their young alive, the eggs being hatched within the body of the parent. This is the case with the *blenny*,

Blenny.

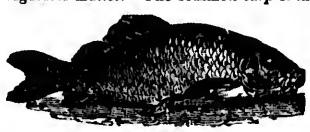
of which several species frequent the British shores, living in small troops among the rocks. They are remarkably tenacious of life, being capable of being kept a good many days in moist grass or moss, but they are of little value as articles of food. The true *Gobies* are chiefly remarkable for the *nest* which they construct among the sea-weed for the protection of their young, which was observed by the ancients. They prefer a clayey bottom, in which they excavate canals, and in these they pass the winter.

The next family Pectorales Pedunculati, derives its name from the peculiar structure of the pectoral fins, which have a kind of wrist formed by the elongation of the bones to which they are attached. This conformation gives these fishes a very strange appearance, and enables them to leap suddenly up in the water in pursuit of their prey, and even to leap over the mud. In many of them the skeleton is semi-cartilaginous. One of the most curious is the *lophius* or *fishing-frog*, of the British seas, which is met with chiefly on muddy shores. It derives its name in part from its wide gaping mouth, and in part from the peculiar manner in which it angles for its prey. It has some curious appendages to its head, which terminate in long, round, and rather brilliant filaments, having a resemblance to worms. The animal lurks in the mud, and puts these appendages in vibration; they are mistaken for worms by small fishes, which they attract, and these are gulped down the capacious swallow of the lophius. To such an extent is this voracity carried, that the *angler* (as it is sometimes called) is often an article of value for the live fish which it has in its stomach, although its own flesh is worth but little. There is an allied genus, the *chironectes*, of which a species abounds on the north coast of Australia. When the tide ebbs far back in the dry season, these frog-fishes are so abundant, and capable of taking such vigorous leaps, that those who have visited these places have taken them at first sight for birds. The fishes of this genus can inflate their large stomachs with air, in the manner of the Tetrodons.

Order II.—Malacopterygii Abdominales.

This order, consisting of soft-spined Fishes which have the ventral fins under the abdomen, contains five families, all of which are highly interesting to the naturalist.

1. The Cyprinidæ, or *Carp* tribe, are all fresh-water fishes. They have the mouth shallow, the jaws feeble, and very often without teeth, but the pharynx is strongly toothed. They are among the least carnivorous of fishes, feeding chiefly on seeds, the roots of plants, and decomposing vegetable matter. The common *carp* is imported



Carp.

into England from the warmer parts of Europe; it thrives better in ponds or lakes than in rivers, it feeds on insects and worms, as well as on vegetables, and it is very tenacious of life, so that it is easily transported from place to place.

2. The family Esocidæ, or *Pike* tribe, contains the

Pike.

most voracious fresh-water fishes, as well as several important marine species. They are distinguished by the absence of fatty matter in the dorsal fin (which exists in the Salmon tribe), and by the position of this opposite to the anal fin. The *pike* is very destructive of the smaller fishes in the ponds and rivers in which it exists, and sometimes attains a considerable size, weighing between thirty and forty pounds. The *gar-fish*, or *sea-pike*, is an allied species, frequenting the British shores and stretching into the Arctic regions. Some of this kind have been known to attain the length of eight feet, and to bite very severely; hence they may be considered as the sharks of northern seas. To this family belongs the most common of the flying-fish, though, as already stated, it is not the only one which deserves the title. The *exocœtus* is at once distinguished from the rest of the family by the immense size of its pectoral fins, by the impulse of which upon the water it is enabled to rise into the air; but it can scarcely be said to *fly*, since it is unable to do more, without again dipping into the water, than partially to sustain itself, and to direct the movement to which the impetus was given at the moment of quitting the water. Nevertheless, the common flying-fish can leap more than two hundred yards in distance, and upwards of twenty feet in height. They are not unfrequently found upon the decks of large vessels, across which they had endeavoured to pass. This power appears to be conferred upon them to enable them to escape from the pursuit of the Coryphæna; but, in avoiding one enemy, they put themselves in the way of others, for voracious birds watch for them and seize them as they rise into the air. They furnish an excellent article of food, and are very abundant in the neighbourhood of some tropical islands; individuals have occasionally appeared as stragglers on coasts of Britain.

3. The Siluridæ are distinguished from all the rest of the order by the want of true scales; having only a naked skin, or large bony plates. The fishes of the genus *Silurus* inhabit the rivers of warm countries; they have a strong spine in front of the dorsal fin, which can be laid flat on the shoulder, or perpendicularly erected so as to become a formidable weapon; and the ragged wounds inflicted by it are reputed (but probably erroneously) to be poisonous. One species, belonging to the sub-genus *Malapterurus*, an inhabitant of the Nile and of the rivers of Central Africa, has electric properties similar to those of the torpedo and gymnotus.

4. The fishes of the order SALMONIDÆ, known as *salmons* and *trouts*, are very extensively, indeed almost universally, diffused over the globe, some of them being confined to fresh-water, and others passing a part of their lives in the sea, but resorting to rivers to deposit their eggs. They are distinguished by the fatty deposition in the dorsal fin, from part of which the spines often disappear. All of this family are clouded with dusky patches when young, as occurs in all the species of Cats. Many remain permanently spotted. The flesh of most of them is esteemed as food. The *salmon* inhabits the seas of comparatively cold regions, ascending the rivers for the purpose of spawning at seasons varying with the climate. The efforts which they make to overcome difficulties in the ascent are very great; they will not only swim against powerful streams, but will leap up cascades of considerable elevation, and find their way to the brooks and small lakes of lofty mountains. They return to the sea after this operation is accomplished, and are followed by the young produced from the eggs they have deposited. These, in their turn, ascend the rivers for the same purpose, and are understood to resort to those in which they were produced. The *trout* appears to vary much in size and colour, according to the climate and other conditions of its residence, so that it is difficult to distinguish species from mere varieties.

Salmon.

5. The CLUPEIDÆ, or *Herring* tribe, is one of the most important families in the whole class, for the amount of food it supplies to man. The fishes belonging to it resemble the Salmonidæ in many characters, but differ in having no fatty matter in the dorsal fin. They chiefly inhabit the seas of the temperate zone. The *herring*, which periodically visits our shores in such immense shoals, was formerly supposed to migrate from Arctic seas; but this is now ascertained to be a mistake, the fish being almost unknown there, and often appearing on the southern shores of Britain before the northern. The fact is rather that the herring, like the mackerel and many other fish, usually lives in the open ocean, and resorts to the nearest coast to deposit its spawn. There are many well-known species, differing but little from the herring, which frequent separate localities. Thus, the *pilchard* is caught especially on the coast of Cornwall and other shores to the southward of those on which the herring most abounds. The *sardine* is taken on the west coast of France and in the Mediterranean, where the herring never appears. The *sprat*, *white-bait*, *shad*, and other British species, belong to the same family; as does also the *anchovy*, well known for its rich and peculiar flavour, which is abundant in the Mediterranean. Other species inhabit the American, African, and Indian seas and rivers, but they are less abundant than those already mentioned.

Order III.—Malacopterygii Sub-Brachiati.

The soft-rayed Fishes, which have the ventral fins brought forwards beneath, or even in advance of, the pectoral, are divided into three families, one of which is equally important to man with the last, if not more so. This is,

Cod.

1. GADIDÆ, the *Cod* tribe. The fishes of this genus are easily known by the softness of all their fins, and by having the ventrals inserted under the throat, and pointed. The greater number live in cold or temperate seas, and furnish a most important article of food, their flesh being wholesome, easy of digestion, and agreeable to the palate, and their numbers (owing to their extraordinary reproductive power) extremely abundant. The *cod* is nearly the largest of the family, but is usually surpassed by the *ling*, which is commonly from three to four feet long: both of these are especially valuable for their excellence when salted. The *haddock* is a smaller species, nearly allied to the cod; for eating in the fresh state, it is perhaps the most delicate of the whole family. Many other species are useful to man, occurring in large numbers in particular localities. Such are the *whiting*, the *coal-fish*, the *pollock*, the *haak* (of which some species frequent high southern latitudes), the *burbot* (which ascends rivers), the *rockling*, and many others. Besides their use as food, these fish are valuable on account of the oil obtained from their large livers, which is very serviceable in the arts.

2. The second family is that of PLEURONECTIDÆ, the *Flat-fish* or *Flounder* tribe. The form of these fish is peculiar, not only for the extreme flattening of the body, but for its deficiency in symmetry. The two flat surfaces—one of which (in the ordinary position of the fish during life) is above, and the other below—are in reality the two *sides* of the fish, differing in several important respects. Both the eyes are placed on the upper side; and its colour is usually much deeper than the other. The body, from the head backwards, partakes a little of the same peculiarity. The two sides of the mouth are not equal, and the pectoral fins rarely so. On the other hand, the dorsal fin, which runs along one of the lateral edges, corresponds with the anal, which occupies the other, and with which the ventrals are sometimes united. So that, when we look at the fish in its usual position, its body appears more symmetrical than it really is. These fishes are destitute of air-bladder, and they frequent the bottom of the sea, from which they seldom rise far. The colour of their upper surface usually corresponds closely with that of the ground on which they lie; and thus they escape the observation of their enemies, and are unnoticed by the small fishes on which they prey. Individuals are occasionally found, however, in which both sides are alike; these are called "doubles;" it is usually the dark side which is doubled. The fishes of this family are found along the shores of almost all countries, and are, generally speaking, wholesome and agreeable as food. The form and aspect of the different species exhibits little variation. The *flounder*, *turbot*, *brill*, *plaice*, *dab*, and *sole*, are the chief species of our own coasts; the *hallibut* is a very large species, attaining the length of six or seven feet, and weighing 500 lbs., occasionally taken in the British seas; and other species inhabit the Mediterranean.

Flounder.

3. The DISCOBOLI, so named from having their ventral fins formed into a sucker or disk, are the last family of this order. By this curious provision, the fishes belonging to this family have the power of attaching themselves to rocks and other hard substances, and thus remain and find their food in situations where every other species would be swept away by the current of water.

Eel.

Order IV.—Malacopterygii Apoda.

The fishes in which the ventral fins are wanting form but one natural family, the Muræniдæ, or *Eel* tribe. They are all lengthened in form, have the spine extremely flexible, the skin thick and soft, and the scales almost invisible. In most of them the external gill-apertures are very small, and open very far back; by which arrangement they are enabled to keep the gills moist for a long time when out of water, whilst the roundness and flexibility of their bodies facilitate their motion upon land. Many of them inhabit rivers, whilst others are exclusively marine. The *eel* is the kind most abundant in Britain. The *conger* is a marine eel, frequenting the European seas; it is one of the largest of the family, being from four to six feet long, and as thick as a man's leg. The *gymnotus*, or *electric eel*,

Gymnotus.

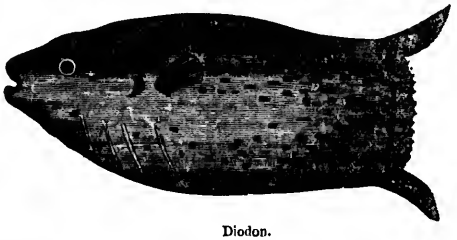
is a native of the South American rivers. It attains the length of five or six feet, and communicates shocks so powerful that men and horses have been stunned by them. This power seems voluntary, and can be sent in a particular direction, or even through the water, the fish in which are killed or stunned by its shocks. By giving these it is greatly exhausted, and requires rest and nourishment before it can renew them.

Order V.—Lophobranchii.

This order is a very small one, containing but one family, of which the genera are few. Their appearance is very peculiar. The tufted gills are covered by a large operculum; but this is bound down by membranes on all sides, so that there is only one small hole for the water to escape. The body is covered, not with small scales, but with shields or plates, which often give it an angular form. In general they are of small size, and almost without flesh. The *syngnathus* possesses a long tubular snout; it is peculiar for the protection which it affords to its young, which resembles that provided in the marsupial Mammalia. The eggs are conveyed into a sort of pouch under the body of the male, and are hatched there, the young fry afterwards finding their way out. Some of these are found in the British seas, as are also the *hippocampi*, commonly called sea-horses, from the resemblance of the upper part of the body (especially when the dead specimen bends in drying) to the head and neck of a horse in miniature. Their tail is prehensile, and they climb or hold on to the stalks of marine plants, by its means. Some of this family are almost destitute of fins, having none but the dorsal.

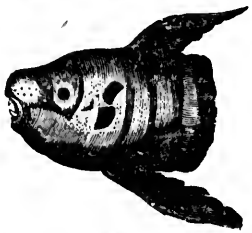
Order VI.—Plectognathi.

This order, the last of the osseous Fishes, approaches the cartilaginous in many points of its organization; principally, however, in the slow ossification of the skeleton, and the imperfect structure of the mouth. They derive their name, as already stated, from the union of the upper jaw to the skull; so that its motion is obtained, not from a distinct joint, but by the mere flexibility of the half-ossified cartilages. The gill-lid is concealed under the thick skin, with only a small opening; the ribs are scarcely developed; and there are no true ventral fins. This order contains two families.



Diodon.

1. The Gymnodontes, or Naked-Toothed Fishes, are distinguished by having the jaws covered with a substance resembling ivory, arranged in small plates (which are reproduced as soon as destroyed by use), and really representing united teeth. They live on crustacea and sea-weed, and their flesh is not palatable. Some species are reputed to be poisonous, at least at particular seasons. The most remarkable species of this family are the spinous globe-fishes, *diodon* and *tetraodon* (their technical names being derived from the apparent division of their jaws into two and four tooth-like pieces respectively), which have the power of blowing themselves up like balloons, by filling with air a large sac which nearly surrounds the abdomen. When thus inflated, they roll over with the belly upwards, and lose all power of directing their course; but they are remarkably defended by spines over their whole surface, which are erected as they are inflated. They are mostly inhabitants of warm seas, but a specimen is occasionally drifted to our coast. The *sun-fish* has a body of somewhat similar form, but incapable of inflation; the tail is so short that it looks like the anterior half of a fish cut in two in the middle. Some species attain an immense size. One which is occasionally taken on the British coast has been known to weigh 300 lbs., and others are much larger.



Sun-fish.

2. The second family, Sclerodermi, contains fishes which are remarkable for their very hard and granulated skins. They have a prolonged muzzle, with distinct teeth. Their skin is covered with scales in some species, and in others very rough, like a file, whence they are commonly termed *file-fishes*. They are principally inhabitants of warm seas, living near rocks or on the surface of the water, their brilliant colours sparkling in the sunshine like those of the Chætodons.

DIVISION II.—CHONDROPTERYGII OR CARTILAGINOUS FISHES.

The skeleton of these fishes is not entirely devoid of calcareous matter, but this is disposed in separate grains, and does not form fibres or plates. Hence the hardest portions of the framework remain quite flexible. The freedom of motion of the spinal column, which is characteristic of fishes in general, is here still further increased, in many species at least, by the continuation of the sac containing gelatinous matter (which in the osseous fishes was simply interposed between each pair of vertebræ) through the whole column, the bodies of the vertebræ being pierced in the centre so as to form a continuous tube. This division contains two subordinate groups: in the first, the gills are attached by one edge only, hanging in fringes as in the osseous fishes; in the second, they are so attached to the skin by the second edges, that the water cannot escape from their intervals except by holes in the surface. Accordingly, instead of having a single pair of large apertures, with a valve-like cover, or *operculum*, behind the head, they have as many apertures on each side as there are arches of gills. The first series contains but one order, and the second the other two.

Order VII.—Chondropterygii Branchus Liberi.

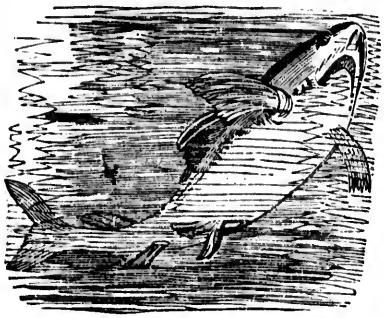
This order contains only one family, the STURIONES, or *Sturgeon* tribe. In many of its characters, as well as in the disposition of the gills, it is intermediate between the Osseous Fishes and the Shark tribe, which may be regarded as the types of the Cartilaginous division. Sturgeons are chiefly river fish, and from their large size, vast numbers, and the quantity of food and other important products they afford, are extremely valuable to man. The common sturgeon of the British shores is about six feet long, and its flesh is somewhat like veal. The rivers falling into the Black and Caspian Seas, however, produce several other species, of which the largest not unfrequently attains the length of fifteen feet, one individual being recorded as having weighed 3000 lbs. The roe of the sturgeon furnishes the caviar so much esteemed in Russia; and its air-bladder furnishes isinglass.

The section of CHONDROPTERYGII BRANCHUS FIXIS is divided into two orders, the first having teeth, and the second having the mouth formed into a sucker.

Order VIII.—Selachii.

This order only comprises one family, that of *Sharks* and *Rays*. A great metamorphosis here takes place in the condition of the bones of the mouth, those which are commonly termed the jaws, in which the teeth are fixed, being very different in position and character in osseous fishes, and the true jawbones not being here developed. This tribe is distinguished from other fishes by many peculiarities: in several members of it the young are produced alive, the eggs being hatched within the body of the parent; and in others the eggs are enclosed in a peculiar horny casing, which has often long tendril-like appendages, that coil round and attach them to other bodies. This is the case with the eggs of the common *dog-fish* of our coast, vulgarly known as *sea-purses*. The Sharks much resemble ordinary fishes in their form, having the gill-openings on the sides of the neck, and the eyes on the sides of the head, in both of which respects the Rays differ from them. The *dog-fish* of the British coasts differs but slightly from the true sharks, and is, in its way, equally voracious.

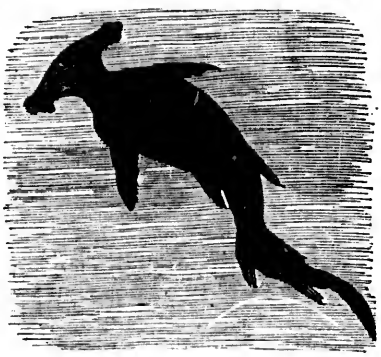
The *white shark* is the most celebrated species of the tribe, being, from its size and voracity, the terror of mariners in the seas it inhabits. It frequents warm latitudes, but has occasionally visited the British shores. It has been known to attain a length of thirty feet, and the opening of the jaws in the largest individuals is sufficient to admit with ease the body of a man. The mouth is placed on the under surface of the head, from



White Shark.

which circumstance the fish cannot bite whilst in the act of swimming forwards, so that a dexterous person has been known to defend himself from its attack.

A remarkable genus allied to the Sharks is the *zygæna*, or *hammer-headed shark*, so named from the projection



Hammer-headed Shark.

of the head at each side in the form of a double-headed hammer, with an eye in the middle of each extremity. The *pristis*, or saw-fish, is another interesting genus. Its general form and character is like that of the sharks, but the snout is extended like the blade of a sword, with strong and cutting tooth-like spines on both edges. With this formidable weapon the fish, which sometimes attains the length of from twelve to fifteen feet, will attack the largest whales, and inflict dreadful wounds. To the shark tribe also belongs the *angel fish* of our own coasts, which forms the link to the rays in its general structure and aspect. The eyes are situated on the back or upper surface of the head; the body is broad and flattened horizontally, and the pectoral fins widely expanded. It commonly grows to the length of seven or eight feet; its appearance much belies its name, being (according to our ideas of beauty) one of the ugliest of fishes, but its flesh is by no means unpalatable.

The *Rays* are less numerous than the Sharks, and abound rather in temperate than in tropical seas. They are characterized by the extreme horizontal flattening of the body, in which, however, there is not (as in the Pleuronectidæ) any want of lateral symmetry. The two sides are expanded horizontally, and unite with the

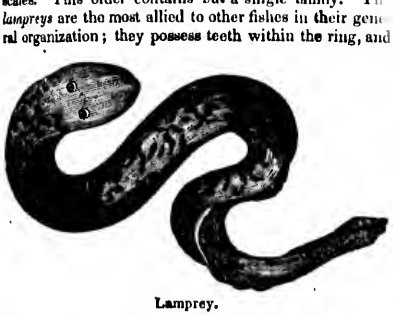
expanded and fleshy pectoral fins to form one continuous surface. The eyes are placed on the back or upper surface, whilst the mouth, nostrils, and gill-openings, are below. To this group belong the *rays* and *skates*, *thornbacks*, and other species; but the most interesting of all is the *torpedo*, or **electric ray**, sometimes found on the Channel coast of England, but more abundant in

Torpedo.

the Mediterranean. The electric apparatus is of very similar structure with that of the *gymnotus*, and it is disposed in the space between the pectorals and the head and gills. The shocks given by this fish, though smart, are not so benumbing as those of the gymnotus; their use in its economy are not apparent, as the animal can obtain its prey without them. The flesh of the rays is wholesome, and that of most species agreeable as food. The skin of some of them is employed in the arts for polishing, and, from that of others, shagreen is made.

Order IX.—Cyclostomata.

The third order of the Cartilaginous Fishes, and the last of the class, is one which contains comparatively few species, and these exhibiting but a very low degree of organization. They take their name from the adaptation of the mouth to the purposes of suction, by its transformation into a round fleshy disk, having the oral opening in the centre, and the margin supported by a ring composed of the cartilaginous jaws united together. The spinal column loses its distinct division into vertebræ, the space elsewhere occupied by their bodies being traversed from end to end by a cylindrical membranous tube filled with a mucilaginous fluid; and this, in the higher species, presents cartilaginous rings at intervals, which are the rudiments of vertebræ; whilst, in the lower, there is no vestige of these bodies, and the whole structure is reduced to the level of that of the Annelida. The pectoral as well as the ventral fins are absent; and the skin is soft and mucous, with scarcely a vestige of scales. This order contains but a single family. The *lampreys* are the most allied to other fishes in their general organization; they possess teeth within the ring, and



Lamprey.

with these they tear the bodies of the animals to which they attach themselves. There is a marine species two or three feet long, and other smaller ones which inhabit rivers. The *myxine* or *hag* is destitute of eyes, and is altogether of lower organization than the lamprey; but the species that differs most in its general characters from the rest of the class is the *amphioxus*, or lancelet. This is a very small animal, about an inch long, sometimes found lurking under stones in pools left by the ebbing tide. It is destitute of almost every one of the characters which have been mentioned as peculiar to vertebrated animals; and, nevertheless, can scarcely be classed anywhere else than with this family.

SUB-KINGDOM—ARTICULATA.

From the Vertebrata, we might pass, in descending the animal scale, either to the Mollusca, or the Articulata, both of which exhibit some points of approximation with them. In both we meet, as in the Vertebrata, with very highly organized, as well as very simply constructed beings. In both we find animals much superior to the lowest Vertebrata; and in both, also, we find species which are in many respects below the highest Radiata. It is the necessary consequence of a *natural* arrangement, which aims at grouping together the different forms of living beings according to the type or plan on which they are constructed, that such should be the case. Neither of these two sub-kingdoms can be regarded as in all respects superior to the other. The high development of the locomotive power in the Articulata strikingly contrasts with its usually slight possession by the Mollusca. On the other hand, the digestive and nutritive systems in the Mollusca are much more complex, and attain a higher organization; so that the heart, for example, of the Tunicata is as powerful in its action on the circulating fluid as that of the highest Articulata. On the whole, however, the Articulata should be regarded as ranking above the Mollusca in the animal scale, since it is in the *animal* powers that the former have the superiority.

The general character of the series has been already stated as being the jointed or *articulated* character of the skeleton or hard portion of the structure, and the enclosure of the whole body in this. Nothing can be found in the Mollusca at all approaching in character to the shell of a lobster or the horny case of the beetle. It is the peculiarity of the skeleton in the Articulata, that it not merely encloses the body, but is prolonged over the appendages for locomotion, where they exist; and the portions of it which cover these are also jointed, for the sake of conferring upon them the requisite flexibility. This structure is more apparent, however, in some cases than in others. In the lowest animals of this series, where there are no appendages for locomotion, and where all movements are effected by the body itself, this is endowed with great flexibility, and the whole envelope is so soft that the division into segments can scarcely be recognised. This is the case, for example, in the leech and earthworm. The articulated character is most apparent in the Centipede tribe, where the segments are all of nearly equal size, and where each possesses a short pair of legs, which are themselves also articulated. But in the highest classes of this sub-kingdom we again lose the appearance of the division into segments, from an opposite cause—the consolidation of several rings into one piece. In proportion as the locomotive power is more intrusted to the extremities, so does it become unnecessary that the trunk should possess much flexibility; and in the same proportion does it become necessary that the portion of it from which arise the muscles of those extremities should be very firmly framed. Accordingly, the part of the body behind the head, which is called the *thorax*, and from which the legs and wings of Insects, and the principal walking legs of Crustacea have their origin, very commonly appears as if composed of one piece, although it is really made up of three or more

segments, each one of which gives origin to a pair of members.

The Articulata are almost invariably of small size; and the bulk of their bodies is made up, not by their digestive and nutritive apparatus, but by the muscles which move it. It is only in those which approach the Mollusca in the vegetative nature of their existence, that we find any considerable dimensions attained. As the Mollusca are an essentially aquatic group, so are the Articulata principally adapted to atmospheric respiration; and the most active among them can even quit the surface of the ground and mount up into the air. We find their respiratory apparatus constructed, therefore, upon an opposite plan. Instead of the blood being sent into external prolongations of the surface—the gills—to meet the air contained in the surrounding fluid, the air is introduced into the body to meet the blood, this being distributed on the sides of cavities or tubes into which it enters. In Insects these tubes have a very complex and beautiful distribution through the body.

The Articulata exhibit a peculiarity in the nervous system, which often enables the real character of doubtful animals to be distinguished. A double cord runs along the centre of the *lower* surface of the animal, studded with knots or *ganglia* at regular intervals, which are so many centres from which the nerves pass off to the different segments. The head, also, has its ganglia, in which the double cord terminates anteriorly. Where the members, however, are not uniformly distributed along the whole body, but are concentrated to one part, as in Insects, Arachnida, and the higher Crustacea, we observe a corresponding concentration of the ganglia in that region. The degree of this concentration indicates the elevation of the animal in the series.

The following classes must be arranged in the articulated series, though in some of them the characteristic structure is very indistinct:—

Annelida, or *Worm* tribe. In these the body is prolonged, without any distinct appendages for locomotion. The habitation is usually aquatic, though sometimes terrestrial. The division into segments is not very distinct, the entire skin being soft.

Myriapoda, or *Centipede* tribe. These have also a prolonged body, but it is provided with legs; and the articulation of the covering both of the body and legs is very distinct.

Insects, which are distinguished in their perfect state by the possession of one or two pairs of wings; by the restriction of the legs, which are never more than six in number, to the thorax; and by the division of the trunk into three portions, the head, thorax, and abdomen, which are usually very distinct from one another. They are also distinguished by their remarkable metamorphosis, commencing from a form which resembles that of the Annelida.

Arachnida, the *Spider* and *Scorpion* tribe, which differ from insects in having the head and thorax united, in undergoing no metamorphosis, and in having eight or more legs.

Crustacea, which have a hard envelope, principally composed of earthy matter, and which are adapted for aquatic respiration. Many of them have the form of insects; but their legs are never less than ten in number.

The foregoing constitute a tolerably regular series, into which we must also introduce the Entozoa, which seem to exhibit the characters of the Worm tribe in their most degraded condition, and the animals composing which are parasitic upon or within others; the Rotifera, or *Wheel-Animalcule* tribe, of which some approach the Polypifera and Polygastrica, while others approximate the Crustacea; and the Cirrhopoda, or *Barnacle* tribe, which bear a strong general resemblance to the Mollusca, but unquestionably belong to this series.

CLASS VI.—INSECTS.

The class of Insects is perhaps the most interesting in the whole animal kingdom, both in regard to the number, variety, beauty, and complexity, of the different forms which it contains, the vast assemblages of individuals of the same species which not unfrequently make their appearance together, and their consequent importance in the economy of nature.

The true Insects are distinguished from the Crustacea by their peculiar apparatus for atmospheric respiration; from the Arachnida by having but six legs (eight being the number in that class), and by the division of the body into three parts; and from the Myriapoda by the limited number of legs and segments, the latter seldom exceeding thirteen. In the perfect Insect it is sometimes difficult to distinguish the division into segments; they may generally be seen, however, on the lower side of the body, especially on the abdomen. But in the larva or caterpillar state they are never obscure, and their number is very constant, being almost always thirteen, one forming the head. Of the twelve segments of the body, three in the perfect insect form the thorax, or division succeeding the head, while the remaining nine constitute the abdomen. It is more common for one or two segments to be apparently deficient (being consolidated with the rest), than for any increased number to be present.

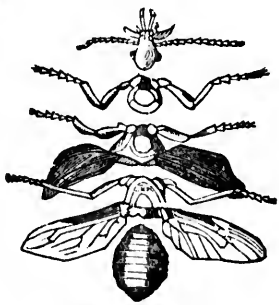
The *metamorphosis*, or complete change of form, which may be seen in the greater number of insects during their development, has attracted much attention from the earliest ages to the present time. The *larva*, which afterwards changes to a beetle, a butterfly, or a wasp, bears no resemblance whatever to the perfect or *imago* form and is in fact allied, in almost every particular of its conformation, to a class far beneath. Moreover, it has to go through an intermediate form—if any thing still more remarkable—that of the *pupa* or *chrysalis*, in which there is an almost complete cessation of activity, but in which preparation is being made for the exit of the perfect insect at its final change. The alteration of the entire character of the animal is no less remarkable than its change of form. In the *larva* condition, its whole energies seem to be concentrated upon the nutritive functions; the voracity is extreme, and the increase in the weight of the body is very rapid; while, in the perfect insect, the body undergoes little increase of size, but it is provided with powers of active movement, and these are principally destined to enable it to seek its mate, for the purpose of propagating its race.

The *larva*, when it first emerges from the egg, bears but a very small proportion to its subsequent bulk. According to Lyonnet, the comparative weight of a full-grown caterpillar of the goat-moth to that of the young one just crept out of the egg, is as 72,000 to 1. During its increase, it throws off its skin several times, like the Crustacea. The larvæ in the different tribes vary extremely as to the degree of their development: in some orders they are extremely imperfect, not even possessing legs; while in others they correspond with the perfect insect in almost every particular except the presence of wings.

After attaining its full growth in the larva condition (the bulk of the body in this state often much exceeding that of the imago), the insect undergoes a very remarkable change, ceasing to take food, and apparently losing all appearance of vitality. In this state it is termed the *pupa* or chrysalis. Many larvæ enclose themselves in a silken cocoon, or in some other kind of envelope, before undergoing this change; and remain in it during the whole period of inactivity, which is sometimes many months in duration. Others bury themselves in the ground; and others, again, suspend themselves in the air. The pupæ of different orders of insects vary, like the larvæ, both in form and in degree of torpor. Some have the whole body enclosed in a horny case, without

vestige of members, and are totally inactive, except when disturbed; while others present the general form of the perfect insect, but appear as if the body and limbs were separately bandaged and laid in close apposition; while others retain all their limbs free, and suffer no diminution in their locomotive powers or in their appetite for food. These, indeed, can scarcely be said to pass into the pupa state at all, their condition being only indicated by the gradual development of the wings. This development is equally taking place beneath the envelope of the pupæ that are enclosed and inactive.

The perfect insect or imago, when it emerges from its pupa case, exhibits in all respects the *form* which is characteristic of the species, and, in general, the *size* also; few growing much after they have attained this condition, and many scarcely eating at all. As already mentioned, the twelve segments forming the body of the larva, may still be recognised here, but very much changed in their character. The three anterior ones are often soldered, as it were, together; forming but one strong sheath for that portion of the body from which the wings and legs proceed, and this sheath affords firm attachment for the powerful muscles which move these organs. Those which constitute the abdomen, however, retain much more of their original aspect. The head is now quite distinct from the body, and connected with it by a neck, which is often very narrow. From each of the segments of the thorax a pair of legs proceeds; and the second and third usually give origin to a pair of wings each. Where, however, only one pair of these organs exists, they proceed from the second segment. The segments of the abdomen never show any vestige of legs. The accompanying diagram represents the chief parts of the perfect insect; the three segments of the thorax are separated from each other to show the organs attached to them.



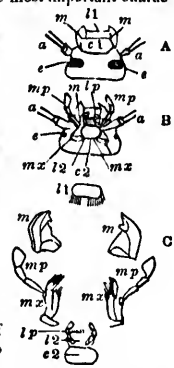
Segments of Insects.

The especial function of the perfect insect is the continuance of the species; and the wings enable it to seek its mate, and to obtain a situation fit for the deposition of its eggs, which are always laid in the neighbourhood of whatever substances will supply the larvæ with nourishment, although it most commonly happens that the imago does not feed upon them. Many insects, such as the *silk-worm* moth and the *ephemera* or May-fly, die soon after having fulfilled this object, to which they proceed very soon after their last change.

However extraordinary is the metamorphosis of insects, it is by no means *unique*, as was formerly supposed. The change of the tadpole into a frog, is an exact parallel to it; for the tadpole is for the time a fish, resembling that class in its entire organization, just as the maggot is for the time a worm. Moreover, we shall hereafter see, in some of the lower classes, a change which is fully as remarkable. When the larva is very imperfect, and the pupa inactive, so that its change to the form of the perfect insect is very striking, the metamorphosis is said to be *complete*; but if the larva is more advanced, and the pupa differs little from it and from the perfect insect, the metamorphosis is termed *incomplete*.

Insects, in their perfect state, are distinguished beyond all other animals for their power of locomotion, and for the perfection of their instinctive actions. In estimating their power of locomotion, the space traversed is of course compared with the length of the body; and thus it is seen that, rapid as is the flight of many birds, that of most insects far surpasses it. The senses of insects appear to be acute. They have generally large eyes, formed, in fact, by the union of a great number of small ones—often several thousand; and although these are fixed, yet, from their being directed at various angles to each other, a great range of vision is obtained. It is believed that insects possess the power of hearing, and also of smell; though no distinct organs for receiving such impressions have been satisfactorily determined. That they have a delicate sense of touch in some part of the body, even where the general envelope is firm, cannot be questioned; and, from observations made upon the social insects, such as bees and ants, there is reason to believe that they communicate with each other by this sense.

The different organs on the head of insects, furnish, by their varieties of conformation, important characters in classification. It will, therefore, be necessary to describe these in some detail. The most important characters, upon which, in fact, the primary subdivision of the class is founded, are drawn from the structure of the mouth; in one large group it is furnished with *mandibles* or jaws, adapted for biting and bruising; while in the other, it is provided with a *haustellium* or proboscis, adapted for suction. Hence the first group is termed MANDIBULATA, and the second HAUSTELLATA. These organs are, however, but different modifications of the same elements.



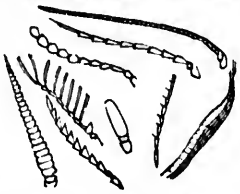
* Different parts of the mouth of a beetle.

In the mouth of the Mandibulata, six principal pieces may be readily distinguished. Of these, four are arranged in two pairs, which work against each other laterally; a fifth piece is above the upper pair, and a sixth below the lower. The two lateral pairs are the jaws; of which the upper pair is distinguished by the name of *mandibles*, and the lower by that of *maxillæ*. The mandibles are usually the largest, and are very powerful organs; sometimes they are provided with sharp or toothed edges, working against each other like those of a pair of scissors; and sometimes with hooked points, more formidable, for the size of the animal, than the teeth of the tiger. These are the principal organs by which the food, of whatever description, is usually obtained; but in the bees and wasps, of which some species are adapted to obtain their nourishment by suction, they are the instruments by which their curious edifices are built up. In a word, as has been well remarked, they supply the place of trowels, spades, pick-axes, saws, scissors, and knives, as necessity may require. The *maxillæ*, or under pair of jaws, are of similar construction, but usually smaller and less powerful. The pieces which are applied above and below to the spaces left between the jaws, are termed *lips*; the upper one being particularized as the *labrum*, and the lower one as the *labium*.

* A, upper side; B, under side; C, parts separated: *a a*, antennæ; *e e*, eyes; *l1*, upper lip; *m m*, mandibles; *m x*, maxillæ, *m p*, maxillary palp; *l2*, labium; *l p*, labial palpi: *c 2*, chin or mentum.

Various modifications of these parts are seen in the different orders of insects, but their existence may always be detected under some form or other. The most remarkable alteration in the structure of the mouth is that which we find in the Lepidoptera or Butterfly tribe. Instead of cutting jaws, we observe a tubular appendage or trunk, which is often of considerable length, and coiled spirally beneath the head, but capable of being unrolled when its point is required to descend into the corollæ of flowers. This tube is composed of two long narrow filaments, which are in fact the *maxillæ* excessively drawn out; these filaments are channelled on the sides at which they approach one another; and by the adhesion of the edges of these channels, which lock together by means of minute teeth, a complete tube is formed. In this mouth, therefore, all the parts except the maxillæ would seem at first sight to be wanting; but they may be detected by a careful examination, and the rudiments of the upper lip, of the mandibles, and of the lower lip, as well as of the *palpi* (organs to be presently described), may be distinctly demonstrated. In other instances, an entirely different modification of the same parts may be observed, which will be noticed in the proper place.

The head of the perfect insect is usually furnished with three pairs of jointed appendages, all of which are probably instruments of sensation. The first of these are termed *antennæ;* they are affixed to the sides of the head, and usually between the eyes and the mouth. The number of joints in them, and the forms they present, vary in the different tribes of insects, as also does their size, within very wide limits. Sometimes they are three or four times as long as the whole body, and sometimes they are scarcely to be perceived; sometimes they are simple thread-like organs, gradually tapering from the base to the point; sometimes they swell out towards the extremity; and often they possess side branches or appendages of various forms. These different characters are extremely useful in classification. The *palpi*, or feelers, are organs which are not dissimilar in general character, but are usually of much smaller size, consisting of seldom more than six joints; of these, one pair is attached to the *maxillæ*, and the other to the *labium*, and they are called *maxillary* and *labial palpi* respectively.



Variously formed Antennæ.

The uses of these organs are involved in some obscurity. There is good reason to believe that all of them are organs of touch; and this sense is probably sometimes most acute in the antennæ, and sometimes in the palpi. There is also reason to believe that the sense of hearing is in some way connected with the antennæ, and a curious modification of the joint at the base seems to be particularly appropriated to this function. It has also been thought that the antennæ minister to the sense of smell.

The *wings* of insects are the organs most peculiar to them; nothing at all analogous being developed in other articulated animals. They consist of a double layer of membrane, prolonged from the skin which covers the body, and partaking of its characters. This membrane is supported by a frame-work of harder structure, composed of ribs, which go by the name of *veins* or *nerves*. These terms must not be supposed to imply any analogy of structure with the organs they designate in higher animals; they are rather drawn from the analogous parts in the leaves of plants.

There is scarcely any organized substance upon which insects are not adapted to prey. In regard to the food of individual tribes of insects, it may here be stated generally, that some are purely carnivorous, devouring only prey which they have themselves killed. Others eat carrion, and even keep it until its decomposition is advanced. Others are herbivorous; some feeding only upon particular species of plants, while others are not restricted, but feed upon almost any vegetable substance. Others again are omnivorous, and will attack almost any thing that falls in their way. The excessive multiplication of insects, which would result from the enormous number of their eggs, and from their rapid growth, is prevented by the influence of other tribes of animals, as well as by the wars of their own tribes against each other. The destruction of the larvæ of some insects by those of others is often enormous, and far exceeds in proportion the diminution in their numbers effected by higher tribes. There are no classes of animals formed to exist on land, however, of which part do not derive a great proportion of their food from insects; and thus, if man does not interfere with the economy of nature, a balance is maintained, which is rarely disturbed. But if these higher tribes be destroyed (as, for example, if a rookery be dispersed), insects will then multiply inordinately, and will become a pest to the country.

Insects are distributed abundantly over all the portions of the globe yet trodden by man. Even in the coldest regions which he has yet explored, they present themselves to his notice during the brief summer; and no severity of the winter appears capable of destroying their vitality, although it reduces them to a state of complete torpidity. It is in tropical regions, however, that the largest and most brilliant species are usually found.

With these general remarks, we are now prepared to consider the principal subdivisions of this important class in more detail. These subdivisions are principally formed upon the character of the wings; since it is found that the structure of these organs affords a good general index of that of the body in general. But it cannot be trusted to alone. For, while certain orders may be included under the general designation *Aptera* or wingless, and another is termed *Diptera* or two-winged, we find wingless and two-winged insects in all the other orders.

Winged insects may be distributed among the eight following orders, of which the first four are Mandibulate, while the rest possess a mouth formed for suction, and are termed Haustellate.

1. Coleoptera (*Beetles*). In these the two anterior wings are converted into a horny or leathery substance, and enclose the posterior when folded.

2. Orthoptera (*Grasshopper, Cockroach*). In these the anterior pair of wings is composed of a substance more resembling membrane.

3. Neuroptera (*Dragon-Fly, White Ant*). Both pairs of wings are membranous, and the nerves form a close network by their interlacement.

4. Hymenoptera (*Bee, Wasp, Saw-Fly*). Both pairs of wings are here also membranous; but the veins have larger areas between them. The tail is possessed of a sting.

5. Homoptera (*Cicada, Lantern Fly*). In this order the four wings are of the same consistence, often somewhat parchmenty; and, when folded, they incline at an angle like the roof of a house.

6. Heteroptera (*Bugs*). The anterior pair of wings is horny or leathery, but generally tipped with membrane; both pairs are horizontal or but slightly inclined.

7. Lepidoptera (*Butterflies and Moths*). These have four membranous wings, covered with minute scales.

8. Diptera (*Gnat, Fly*). These have but two wings, and are in many respects parallel to the Hymenoptera.

Besides these, there are some small orders intermediate between the principal groups. Thus a separate order, Trichoptera, has been formed to include the

case-worm flies, which are intermediate between LEPIDOPTERA and NEUROPTERA. The order STREPSIPTERA, again, comprehends a small group termed *wasp-flies*, intermediate between the LEPIDOPTERA and DIPTERA.

The APHANIPTERA, the order to which the flea belongs, are entirely *apterous* or wingless, and parasitic; but undergo a metamorphosis, by which they show an alliance with the Diptera.

The Wingless Insects, which do not undergo any metamorphosis, may be distributed into two classes—1. PARASITA (*Louse*); and, 2. THYSANOURA (*Sugar-Louse, Spring-tail*). These connect true Insects with the Myrispoda.

These orders will now be considered more in detail.

Order I.—Coleoptera.

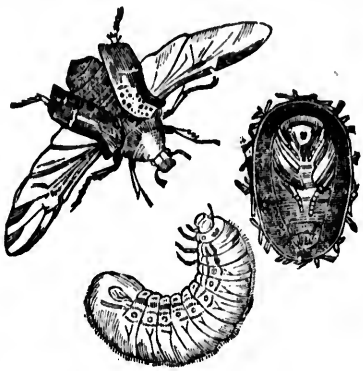
This order comprehends all insects which have the anterior pair of wings converted into wing-cases or *elytra*, and which undergo a complete metamorphosis. These wing-cases are of horny consistence, and are opaque, or nearly so. When expanded, they are of little or no use in flight; and, when closed, they meet along the back, in a straight line, which is called the suture. The second pair of wings constitute the true organs of flight; they are of large size, and of membranous texture; and, when unemployed, they are shut up in several transverse folds, and are entirely concealed beneath the elytra. The mouth is formed for mastication, and possesses two horny mandibles. The head is provided with two antennæ, of variable form, and of which the number of joints is usually eleven; these often differ considerably in the two sexes. The eyes are large and protuberant, especially in the carnivorous species, and in those, the slowness of whose habits makes them need quick powers of sight for the purpose of avoiding their enemies.

The body exhibits a well-marked division into thorax and abdomen. The former consists, as usual, of three segments; but the first of these is so largely developed at the expense of the rest, as to appear almost to constitute the thorax in itself. The abdomen usually consists of only six or seven segments; the remainder of the nine which properly form this part being consolidated in the last.

Although the characters already mentioned are applicable to by far the greatest number of insects included in this order, nearly all of them are subject to exceptions.

Thus, there are some species in which the organs of flight are altogether wanting, as in the female of the glow-worm; others which have elytra, but no wings; others, again, in which the elytra adhere together along the suture; others, in which they overlap; others, in which they do not meet; and others, in which the wings are longitudinally folded. It is well for the student to be aware that such exceptions exist in almost every large natural group, however definite its characters may generally be. In none of these instances is there an exception as to more than one or two of the characters; the remainder conform to the usual type. The most universal is that of the metamorphosis, which, being *complete*, distinguishes this order from others approaching it in the structure of the mouth or in the character of the wings.

The *larvæ* are worm-like in their aspect; the head is usually horny, and the rest of the body soft. There is generally a pair of short jointed legs attached to each of the three first segments, representing those of the perfect insect. Those which possess legs are usually active in their habits; but there are others which, leading a retired life, and being born in the midst of their food (such as the nut weevil), are destitute of legs. The larvæ of the carnivorous species have in general the most robust legs; and in some of the herbivorous species these are replaced by fleshy prominences, or pro-legs. A pair of these



Rose-beetle, in its different shapes.

generally exists on the last segment of the abdomen. Previously to undergoing its change, the larva often forms a case for itself of bits of earth or chips of wood, united by silken threads or gluey matter. The *pupa* or chrysalis is inactive, sometimes even for years, and takes no nourishment; but the form of the future beetle is plainly perceived, the different parts being encased in distinct sheaths.

There is much difficulty in forming a simple natural classification of this immense tribe, on account of the great number of distinct species it includes, and their strong general resemblance to one another. Hence it is often necessary to resort to characters of great minuteness as the groundwork of the system; and it sometimes happens that, by the adoption of such a plan, tribes which are in reality closely allied in general structure, are placed in different groups, and others are brought together which are generally dissimilar. No better system has yet been proposed, however, than that of Latreille, who took as the basis of his classification the number of joints in the *tarsi*, or divisions of the foot. He thus formed the four following sections:—

1. PENTAMERA (or five parted), in which the tarsi of all the feet are five-jointed, the fourth being of ordinary size.

2. HETEROMERA (or differently-parted), in which the four anterior tarsi are five-jointed, and the two posterior four-jointed.

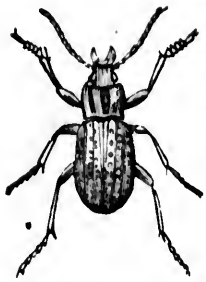
3. TETRAMERA (or four parted), in which all the tarsi have four distinct joints. It has lately been observed, however, that the fifth joint exists in these, although it is very minute, and concealed in one of the others.

4. TRIMERA (or three parted), in which only three ordinary-sized joints exist in the tarsi—a fourth of small size, however, being also present. Hence these two last sections may be more correctly denominated Pseudo-Tetramera and Pseudo-Trimera.

Each of these sections contains several families, of which the most important will now be noticed.

Section I. PENTAMERA.—1. The first family of this section is composed of Beetles exclusively carnivorous, hunting after and devouring other insects, and carnivorous even in the larva state. These *Carnivora* are characterized by the possession of six palpi, and by the termination of the jaws in a sort of claw or hook. Some of them are aquatic; others terrestrial. In many species there are no wings under the elytra. The terrestrial carnivora have legs fit only for running; their body is elongated, and their eyes are prominent.

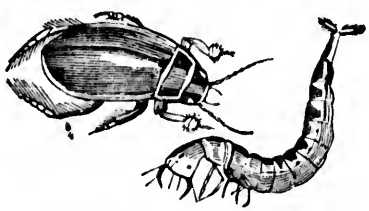
To this division belongs the tribe of *Carabidæ*, which is of very great extent, above two thousand species



Carabus Clathratus.

having been brought together by a single collector. Their bodies are of very firm consistence, whereby they are enabled to creep under stones, and through fissures, and are also prevented from being injured by the insects they attack. They prowl about on the surface of the ground, under stones, &c., beneath the bark of trees, or in the moss growing at their roots, in search of their insect prey, which principally consists of the herbivorous species. Some of them are nocturnal in their habits, feeding upon Cockchafers and other species of herbivorous beetles that fly abroad by night. The habits of the family are not exclusively carnivorous, however, for some species generally found in corn-fields are clearly ascertained to feed upon growing grain. Many larger species of this tribe are provided with a very curious means of defence; being enabled to exhale a very fœtid odour, and to discharge from the abdomen, to a considerable distance, an acrid fluid capable of producing considerable irritation. In the *bruchinus*, this fluid is so highly volatile, that, immediately on coming in contact with the air, it becomes a bluish vapour of very pungent scent, and makes a sort of explosion; hence the species possessed of this power have been termed Bombardier Beetles. They mostly live in societies.

The *aquatic* Carnivora form a tribe far less numerous than the terrestrial species, and are characterized by the peculiar modification of the lungs, which adapts them for swimming, these members being flattened and fringed with bristles, so as to serve as oars. They pass their larva and perfect states in water; quitting it, however, in order to undergo their metamorphosis into pupæ. The larvæ have the body long and narrow, with a strong head armed with powerful mandibles, and they are of very active carnivorous habits. They breathe by organs adapted for aquatic respiration, but the perfect insect can only breathe air, and it is obliged to come to the surface occasionally for that purpose. The *dytiscus*, the principal genus of this tribe, is common in fresh and placid



Dytiscus Marginalis—Larva and Imago.

waters, such as lakes, pools, or ditches. Its larva feeds upon other aquatic larvæ, such as those of dragon-flies, gnats, &c., and moves quickly through the water, striking it by its expanded tail. The pupæ may be found buried in the adjoining banks.

2. The next family is that of Brachelytra, which possess but four palpi, and are distinguished, as their name imports, by the shortness of the wing-cases. The family consists of only one genus, *Staphylinus*, of which one of the largest species is known by the name of devil's coach-horse, and is frequently to be seen running about garden walks. These insects run and fly with equal agility They are very voracious, but do not feed upon living prey, deriving their nutriment from dead and decaying animal matters, especially fungi, &c., in which they chiefly reside. They are also found in profusion under heaps of putrescent plants. They all possess the faculty of emitting a powerful odour, which seems to serve as a means of defence; and this is, in some instances, of peculiarly fœtid character. The larvæ feed on the same substances, and frequent the same situations, as the perfect insect. This group leads, in many respects, towards the Earwig tribe, with which the next order commences.

3. The family Serricornes is distinguished by the toothed or serrated form of the antennæ. Like the last, it possesses four palpi; but the elytra completely cover the body. Some of this family, having the body of solid consistence and oval in form, have the head buried, as it were, in the thorax, which advances on its two sides nearly as far as the mouth. In this way are formed the *Buprestis*, distinguished for the splendour of its colours, many of its species having spots of golden hue upon an emerald ground, whilst in others azure glitters upon the gold. These brilliant species belong to tropical climates, which these insects appear especially formed to inhabit, our native species flying with the greatest activity in warm weather. They live among trees; and if an effort be made to seize them, they counterfeit death, and fall to the ground. The beetles belonging to the allied genus *Elater* are commonly called skip-jacks; for, when laid on their backs, being unable to raise themselves on account of the shortness of their feet, they spring perpendicularly in the air, so as to alight upon their feet. This is effected by a violent backward blow of the head against the surface on which they are lying. The larva of an English species is known to the farmer as the wire-worm, which does much injury by devouring the roots of the corn. A species of elater inhabiting the West Indies and South America, has two brilliantly luminous spots upon the front of the thorax; and a portion of its abdomen which is uncovered during flight is also illuminated.

Another interesting genus of this family is the *Lampyris*, to which belong the glow-worm of this country, and some of the fire-flies of warmer regions. The body of these insects is very soft, especially the abdomen; and it is from the two or three last segments of this part of the body, that the phosphorescent light for which they are so remarkable is emitted. Its intensity is evidently dependent in a great degree upon the state of the animal; if the insect be irritated it is increased, but if its powers are depressed or exhausted it is lessened. It seems to be sometimes withdrawn simply at the will of the animal. In the glow-worm (*L. noctiluca*) it is only the female that is luminous; and she is destitute of wings and elytra, which the male possesses. They are only active by night; and as the male is known to be attracted, like moths, by lights in houses, it is probable that the phosphorescence of the female is given for the purpose of signalizing her position to him. In most of the tropical species, both sexes are furnished with wings.

4. The next family of Pentamerous Coleoptera is that of Clavicornes, characterized by the club-shaped form of the extremities of the antennæ. These are partly terrestrial and partly aquatic; they feed for the most part on animal matter, at least in the larva state. The terrestrial ones seem to prefer substances which are in a state of decay; they creep slowly, and are mostly of a dark colour—black or bronzed. One of the most interesting genera is the *Necrophorus*, or burying-beetle, so named from its habit of excavating the ground beneath the dead bodies of small quadrupeds, such as mice or moles; when they have interred the carcass, they deposit their eggs in it, and the larvæ when hatched feed upon the flesh.

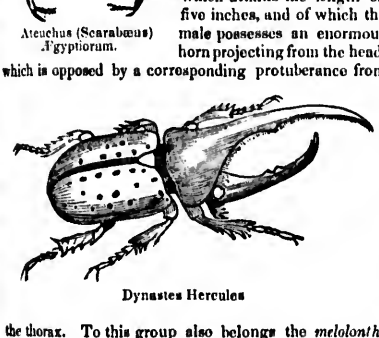
5. The Palpicornes also possess antennæ with a

club-like termination; but these are never longer, and usually shorter, than one of the pairs of palpi. Nearly all of these are aquatic, and have their legs formed for swimming. The most remarkable genus is the *Hydropaulus*, of which a large species, *H. piceus*, an inch and a half long, oval, of a brown-black colour, and highly polished, is common in the ponds and ditches of this country. It swims and flies well, but walks badly. The eggs are laid in a sort of cocoon spun by the female and coated with a gummy matter which is impervious to the water on which it floats. The larvæ, which have a worm-like body, with six feet, the head armed with strong mandibles, are very voracious, feeding upon tadpoles and the young fry in fish-ponds, and upon small fresh-water Mollusca.

6. The last family of the Pentamerous section, the Lamellicornes, is of very great extent, and one of the most striking of the whole Beetle tribe, in respect to the size of the body, and the variety in the form of the head and thorax in the different sexes; and often, also, in those species which in their perfect state live upon vegetable substances, in respect to the brilliancy of the metallic colours with which they are ornamented. But the majority of the other species, which subsist on decomposing vegetable matter, are of an uniform brown or black colour; though some are not inferior in brilliancy to the preceding. All have wings, and they crawl but slowly along the ground. None of them are aquatic. Their food consists of dung, manure, tan, and particularly (in some species) of the roots of vegetables; whence these insects, especially in their larva state, often occasion great loss to the cultivator. This family receives its name from the peculiar conformation of the antennæ, which terminate in a mass formed of the three last joints; these are flattened into plates or lamellæ; and sometimes arranged like a fan or the leaves of a book, sometimes in the manner of a comb, and sometimes enclosing each other. The family is distributed into two principal sections, the *Scarabæi* and the *Lucani*.

Of the *Scarabæi*, one subdivision, including the sacred beetle of the Egyptians, feed principally upon the excrements of various animals, and they enclose their eggs in balls of the same (whence they have been called Pilularii), which they roll along with their hind feet (several often being in company), until they reach the hole in which they are to be deposited. A most remarkably formed species is the *dynastes hercules*, a native of Brazil, which attains the length of five inches, and of which the male possesses an enormous horn projecting from the head, which is opposed by a corresponding protuberance from the thorax. To this group also belongs the *melolontha vulgaris*, or common cockchafer, which is most destructive to vegetation both in its larva and perfect condition, feeding on the roots in the one case and on the leaves and young shoots in the other. The larva lives for three or four years beneath the ground, becoming lethargic in winter but actively voracious in summer. Their excessive multiplication is usually prevented by birds; but if these be kept away, they increase very rapidly, and become a complete pest to the cultivator. The perfect insect sometimes makes its appearance in such swarms as to devastate an entire forest.

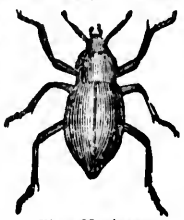
Ateuchus (Scarabæus) Egyptiorum.



Dynastes Hercules

The *Lucani* or *Stag-Beetles* derive their common name from the peculiar form of the mandibles, which are very large, curved, and toothed, like stag-horns. The *L. cervus* is one of the largest British insects, the males being two inches or more in length. This species flies about in the evening in the middle of the summer, especially round the oaks, upon the wood of which the larva feeds, remaining in that state for several years before undergoing its final transformation. Some of the exotic species of this group are very large and splendidly coloured.

Section II. Heteromera.—The Coleoptera of the second section entirely feed on vegetable substances; they are all terrestrial, and most of them frequent dark places. In the first family, the Melasoma, the body is of an ashy-brown or black colour, and for the most part the wings are absent, the elytra being united along the suture. They live for the most part in the ground, beneath stones, or in the sand—often, also, in low and dark parts of buildings, such as cellars, stables, &c. This tribe of insects is very tenacious of life; individuals have been known to remain alive for six months without food, and stuck on a pin. To this family belong the *blaps mortisaga*, a beetle often found in dark and dirty places about houses; and the *tenebrio molitor*, of which the larva is known under the name of the meal-worm, living in corn and flour, and the perfect insect frequents bakehouses, corn-mills, &c., where it may often be found in the evening.



Blaps Mortisaga.

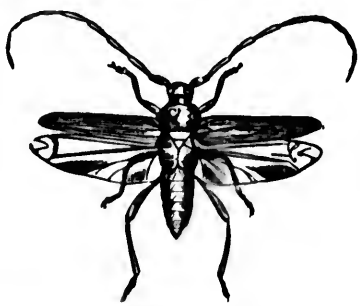
In the family *Trachelides* the head is triangular or heart-shaped, and carried on a kind of neck, which separates it from the thorax. The body is soft, the elytra being flexible, and sometimes very short. The majority live in the perfect state upon different vegetables, devouring the leaves or sucking the honey of the flowers. Many, when seized, depress the head and contract the feet, as if they were dead. Their colours are often very brilliant. This is well seen in the *cantharis vesicatoria* or blistering-fly, which is of a shining green metallic hue; this insect is most abundant in Spain, but appears about midsummer in France, and is found most abundantly on the ash and lilac, of which it consumes the leaves. Its larva lives in the earth, and feeds upon the roots of vegetables.

Section III. Tetramera.—All the insects of this section are likewise vegetable-feeders. The perfect insect is found upon the flowers and leaves of plants; the larvæ are often produced in their interior; and, when thus hatched in the midst of their food, their legs are commonly very imperfect. Very often the true legs are almost entirely absent, and their places supplied by fleshy tubercles. The first family, that of Rhyncophoræ, or the *Weevil* tribe, is distinguished by the prolongation of the anterior part of the head into a kind of muzzle. The number of species in this family is very great, nearly 4000 have been reckoned. Many of them are extremely destructive; especially the *calandra granaria*, or corn-wevil, which commits great havoc in granaries. To this tribe belongs one of the most splendid of all

beetles, the *curculio imperialis*, well known as the diamond beetle, a native of South America, in some parts of which it abounds. There are small species belonging to our own climate, which are scarcely less brilliant when magnified in a good light.

The second family of the Tetramerous Coleoptera has received the name of Xylophagi (Wood-eaters) on account of the peculiar habits of the beetles composing it. They usually live in wood, which their larvæ pierce in every direction; and, when abundant in forests, especially those of pines and firs, they destroy the trees in a few years, and sometimes in enormous numbers. They are destitute of the prolonged muzzle of the last order, and have short antennæ, thickened towards the tips. One of the most important species is the *bostrichus typographus*, so named from the figure of its burrows, which has at different times ravaged the forests of Germany. It devours the soft wood beneath the bark, which is most essential to the vegetative processes, both in the larva and perfect state, and thus causes the death of the tree. It was reckoned that a million and a half of pines were killed by this species alone in the Hartz forest, in 1783; and that as many as 80,000 insects were ordinarily engaged in the destruction of each tree.

The beetles of the family *Longicornes* are distinguished by the great development of the antennæ, which are always at least as long as the body, and often longer. The larvæ mostly reside in the interior of trees or under the bark, and are destitute of feet, or have them very small. They are furnished with robust mandibles, and do much injury to trees, especially those of large size, by burrowing deeply into them. They are vegetable-feeders in their perfect state also, and do great injury to plants, some attacking the leaves and others the roots. Many of them produce a slight creaking sound, by the friction of the joint which unites the thorax to the abdomen. Many of these are brilliantly coloured, especially the tropical species. Some of them are remarkable for exhaling an agreeable musky odour. This is the case with an English species, the *callichroma moschata*, which is about an inch long, entirely green or shaded with blue, and is very common upon willows.



Callichroma Moschata.

Section IV. Trimera.—The beetles of this last section are mostly of small size, and they are not very common. Their habits are various, a portion feeding upon fungi, and the remainder chiefly upon aphides. To the latter section belongs the genus *coccinella*, of which several species are known in this country under the name of lady-birds or lady-cows. They sometimes appear in great profusion, and have created much alarm. It is erroneous to suppose, however, that they do any injury to vegetation; for, on the contrary, they are of great benefit to plants, by feeding on the aphides which infest them; and this they do both in the larva and perfect states.

Order II.—Orthoptera.

The order Orthoptera comprehends all insects that have the mouth armed with jaws fitted for mastication, and two pairs of wings; of which the anterior encase the others, the posterior being membranous, and folding longitudinally during repose. In many respects they resemble the Coleoptera; and they are closely connected with that order by the Forficulidæ, or *Earwig* tribe, which partake of the characters of both. But they differ from the Beetles in the softer covering of their bodies; in the partially membranous character of the anterior pair of wings, which seem intermediate between the horny elytra of Beetles and the membranous wings of other insects, and which do not meet along the back when closed; and in the fan-like manner in which the posterior wings are folded up beneath them, which is permitted by the straight direction of their veins. They differ also in their metamorphosis; for, while that of the Beetles is complete, that of the Orthoptera is only partially so; for the larva and pupa closely resemble the perfect insect in form, walking and feeding in the same manner, and differing in but little else than the absence of the wings and wing-covers, which are gradually developed in the latter.

This order comprises numerous well-known insects, often of large size and splendid colours; such as grasshoppers, locusts, walking-leaves, as well as cockroaches and earwigs. Some of the largest of known insects belong to it; a few species attaining a length of eight or nine inches, and an equal expansion of wings. Comparatively few of this order are inhabitants of temperate regions; it attains by far its greatest development, both in number, size, and colour, between the tropics. All the known Orthoptera are terrestrial, both in their perfect and two previous states. Some are purely carnivorous, and others are adapted to a mixed diet—the Cockroaches, for example, being capable of feeding on almost any organized matter, while the great majority feed upon plants. Hence, from their large size, and the quantity which each individual can devour, they are among the most destructive of all the insect tribes, when they appear in large numbers. This is particularly the case with the locusts in warm countries, the ravages of which not unfrequently cause famine and pestilence, both among men and beasts.

The Orthoptera are divided into two principal families. In the first, that of Cursoria, the legs are all alike, and adapted for running. They have generally the wing-covers and wings resting horizontally on the body. In the second, the *Saltatoria*, the thighs of the hind legs are much larger than the rest, by which they obtain great powers of leaping. In some of these, the wings meet at an angle when folded, like the two sides of a roof. The males have the power of making a sharp creaking noise, which is very loud in some species.

1. The Cursoria contain three well-known forms—the *Earwig*, *Cockroach*, and *Mantis*. Of these, the first approaches more closely than the rest to the Coleoptera; but have a peculiar character of their own in the forceps with which the posterior part of the body is provided; these are used as weapons of offence and defence. The *Blattæ*, or Cockroaches, are intermediate between them and other Orthoptera. These well-known insects are now pretty generally diffused over temperate climates, although most of the species are believed to have been originally natives of tropical regions. Their wings are small in proportion to the weight of their bodies; and in cold climates are seldom enough developed to lift them from the ground. The females are generally almost destitute of these organs.

The Mantidæ are purely carnivorous insects, of which none are natives of this country. They differ much from the Blattæ in the form of the body; which,

instead of being flattened and ova., is narrow and elongated. The first pair of legs is enormously enlarged, and forms a very powerful organ of attack. They frequent trees and plants; and the forms and colours of their wings and bodies are often so adapted to those of the leaves and twigs which surround them, as to give them remarkable power of eluding observation. Hence these have been called walking-leaves. One species, the *mantis religiosa*, is regarded by the natives of the countries it inhabits with superstitious reverence, on account of its occasionally assuming the attitude of prayer. This is, however, the position in which it lies in wait for its prey; the front of the thorax being elevated, and the two fore-legs held up together, like a pair of arms, prepared to seize any animal that may fall within their reach. They are extremely voracious insects; and, if kept together without food, will fight, the victor devouring its conquered adversary.

Mantis Religiosa.

2. The family SALTATORIA consists of numerous species allied to the well-known *Crickets*, *Grasshoppers*, *Locusts*, &c. Besides the peculiarities already mentioned, they are remarkable for the deposition of their eggs in the ground, which is generally accomplished by means of a long horny ovipositor. The mode in which the sound is produced varies in different species.

The first division of the Saltatoria, termed *Achetidæ*, includes the species known as *Crickets*. These are essentially inhabitants of the ground, in which many of them burrow; few have any power of active flight. The greater number of them, like the common house-cricket, are nocturnal.

The next subdivision of the Saltatoria, the *Gryllidæ*, is distinguished by the roof-like position of the wing-covers, when they are closed; they also possess very long thread-like antennæ. This group contains the *Grasshoppers* and their allies, which, although bearing a general resemblance to locusts, differ from them in the inferior robustness of the body and the delicacy and slenderness of the appendages.

The last section consists of the various species of migratory locusts, forming the tribe *Locustidæ*. These are formed for a more active life than the preceding, being able to leap much farther, and to sustain a longer flight. Their powers of devastation, also, are enormous; for they are produced in vast numbers, and live in societies, so as speedily to destroy the vegetation of the spot on which they have settled. Thence they take their flight in great swarms to adjoining districts; and so great is the number of which those swarms consist, that it is not speaking figuratively to say that the sky is darkened by their passage.

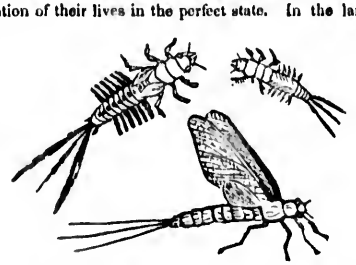
Order III.—Neuroptera.

The Neuroptera resemble the Coleoptera and Orthoptera in the structure of the mouth, but differ from them in the conformation of the wings. The anterior as well as the posterior pair are here membranous and transparent. In both, the veins form a very beautiful and minute network, subdividing and uniting again, so as to divide the whole surface into a large number of cells, which very much exceed in number those of the wings of any other tribe of insects. The posterior wings are usually as large as the superior, or sometimes even larger: if narrower, they are generally longer.

The body of the insects of this tribe, which contains the well-known *Dragon-flies*, *May-flies*, *Ant-lions*, and *White Ants* or *Termites*, is generally prolonged, and destitute of any very hard integument. They are of intermediate size, none exceeding in dimensions the largest dragon-flies of this country, and none exhibiting the minuteness of some Hymenoptera and Coleoptera. They differ in the character of their metamorphosis as well as in their adult structure; for in some the metamorphosis is complete, the larva undergoing a marked change of form; in others there is not much difference, except in the absence of wings, between the larva and the perfect insect. By these differences the order may be subdivided into two groups, in the first of which the pupa is active, while in the second it is quiescent, except just before the assumption of the perfect state. The first of these groups may be farther divided into those which have terrestrial larvæ, such as the *Termitidæ*, and those which are aquatic in their preparatory states, such as the *Libellulidæ*, or Dragon-flies, and the *Ephemeræ*, or Day-flies. These pass the first two stages of their lives in water, respiring by means of peculiar organs placed at the sides or extremity of the abdomen. In other respects their larvæ and pupæ nearly resemble the perfect insect. They creep out of the water to undergo the final metamorphosis.

1. The LIBELLULIDÆ are well-known insects, being easily distinguished by the slender form of their bodies, their varied colours, their large gauze-like wings, and the rapidity of flight with which they pursue other insects upon which they feed. They have a large head, of rounded form, furnished at its sides with two very large eyes. The eggs are deposited upon aquatic plants, and the larvæ are produced in water, in which they remain until their last metamorphosis.

2. The EPHEMERIDÆ derive their name from the short duration of their lives in the perfect state. In the larva

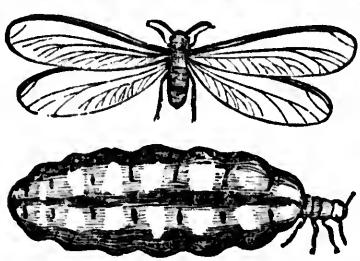


Ephemera Vulgata.—Larva, Pupa, and Imago.

condition they exist for two or three years; in this and the pupa state they reside in the water, burrowing in the banks. In this condition, the abdomen is furnished on each side with a row of plates, which appear to serve as gills for respiration, and also to act as paddles. The pupa differs from the larva in possessing rudiments of wings, which are covered over with scales. At the moment of their last change they quit the water, and appear, after casting their skin, in a new form; but, by a singular exception to what is elsewhere observed, they have to undergo another moult before they are fit for propagation. They generally appear at sunset in the fine days of summer and autumn, along the margin of

the streams, &c., in which they have been developed. They take no food after their final change; and as the propagation of the race is then their only object, they die almost as soon as it has been performed, often in a few hours after their exit from the water.

3. The TERMITIDÆ, or White Ants, are terrestrial, active, and carnivorous or omnivorous, in all their stages. In several points of their structure they approach the Orthoptera; whilst in their habit of living in societies they resemble the Hymenoptera. Unlike the social tribes among the former, however, the neuters or sexless individuals in these communities officiate only as soldiers; and those which are here denominated workers are in reality the larvæ, which closely resemble the perfect insect, except in the absence of wings. These insects commit the most extraordinary ravages, the numbers in each colony being almost incalculable, and their voracity extreme. Their nests are sometimes concealed below the surface of the earth, or in the interior of trees, timbers, &c.; and through these they bore galleries in such a manner, that, though the outer surface is left untouched, they fall to pieces on the slightest violence. Sometimes the nests are elevated to several feet above the surface of the ground, and have a pyramidal roof. When arrived at their perfect state, the Termites quit their habitation, and fly abroad during the evening or night in great numbers; they lose their wings before the morning, and some of them, falling to the ground, become the prey of birds, reptiles, &c. The females, however, are sought by the workers, who imprison them in royal chambers (as they have been termed) in the centre of the nest.



Queen in the winged state, and when filled with eggs.

The abdomen subsequently attains an enormous size from the quantity of eggs it contains; and these, when laid, are carefully tended by the workers and defended by the soldiers.

4. Of the division of Neuroptera, in which a more complete metamorphosis occurs, the family of MYRMELEONIDÆ is one of the most remarkable. Their larvæ have received, from their peculiar habits, the name of *ant-lions*; they excavate conical pit-falls in fine sand, and bury themselves at the bottom, their long mandibles only appearing above the surface; and by these any luckless insect that happens to fall down the hole is immediately seized and killed.

The remaining families of this order need not be here particularized.

Order IV.—Hymenoptera.

In the membranous character of their four wings, the insects of this order resemble the Neuroptera; but they cannot well be mistaken for them. The anterior wings are usually much larger than the posterior; the veins or nervures are much fewer in number than in the Neuroptera, and do not form a close network by their ramifications, as in that order. In some of the minute species the wings are almost, or even entirely, destitute of nerves. Another character furnished by the wings consists in the connection of the anterior and posterior during flight, by means of a series of minute hooks along the front edge of the latter, which catch the hinder margin of the former, so as to produce one continuous margin on each side.

The principal character of this order, however, is derived from the structure of the mouth; for, although considered as mandibulate insects, the Hymenoptera are much better fitted for imbibing their nourishment by suction than for obtaining it by mastication, their maxillæ being much prolonged and channelled, and even uniting at their base into a tube, so as to form a kind of proboscis. This is well seen in the bee. The Hymenoptera are also peculiarly distinguished by a prolongation of the last segment of the body in the females, into an organ which is in one division of the order a *sting*, and in the other an *ovipositor*, or instrument for depositing the eggs, usually possessing the power of boring a hollow for their reception.

The Hymenoptera are further remarkable for the great development of their instinctive faculties and of their locomotive powers. It is in this order that we find the most remarkable examples of contrivance, and skilful adaptation of means to ends; but this adaptation results, it would appear, not from an exercise of *intelligence* on the part of the animals themselves (as in man and the higher Vertebrata), but from their blindly following out a plan laid down for them by the Almighty Designer. This inference may be deduced from the *invariability* of the operations performed by different individuals among the same species, so that a history of the life of one is equally applicable to all. The adjustment of instinctive actions to each other is nowhere more remarkable than in the case of the *social* insects, which are chiefly restricted to this order. The Bees, the Wasps, the Ants, the Saw-Flies, the Ichneumons, and the Gall-Flies, have attracted the attention of the observer of nature from the earliest period.

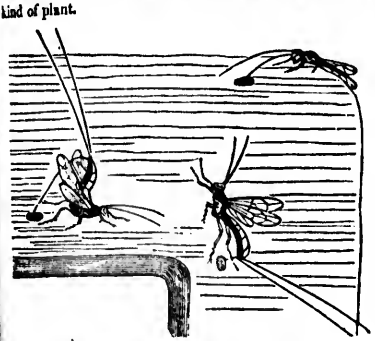
The insects of this order undergo a complete metamorphosis, the larvæ being amongst the most imperfect of those of any tribe. In the greater proportion of the order they are destitute of feet, and resemble little worms. These are dependent upon the instinctive care of the parent for support; which is either provided for by the deposition of the eggs in situations where the future grub will be certain of an ample supply of food, or by the active exertions of the parents, which convey to the young the food they have themselves collected for them, or by similar exertions on the part of a race destitute of a peculiar sex (hence termed *neuters*), on whom this charge more especially devolves. When arrived at their full growth, and after undergoing several previous moultings, the larvæ are transformed into inactive pupæ, in which all the limbs of the future insect are visible, encased in distinct sheaths, and folded on the under surface of the thorax. During this part of their existence they take no food. In their perfect state, these insects, for the most part, take but little nourishment; and this almost exclusively consists of the nectar of flowers. Many of them, however, such as the Wasps, attack and destroy other insects; but these are often destined, not for their own support, but for the nourishment of the young. This order is of considerable extent, being inferior only to the Coleoptera; and it has been estimated as containing one-fourth of the whole insect population. It attains its greatest development in warm climates; for of the numerous species inhabiting this country, the greater part are of very small size. None of the species, however, attain any great dimensions very few exceeding or attaining two inches in length, or three in the expansion of the wings. The duration of their lives, from the hatching of the egg to the final change, is believed never to exceed a year.

This order may be primarily divided into two sections, the TEREBRANTIA, in which the female is furnished with a saw or borer for the deposition of the eggs; and

the ACULEATA, in which the abdomen of the females (and neuters) is armed with a sting connected with a poison reservoir. In the former, the antennæ vary considerably in the number of their joints; in the latter, there are always twelve in the female and thirteen in the male. The Terebrantia may be again divided into the PHYTIPHAGA, in which the larvæ feed upon vegetable matter; and the ENTOMOPHAGA, in which they in general feed parasitically upon living insects. The Aculeata are in like manner divided into the PRÆDONES, or predaceous tribes, which do not collect pollen, and in which the larvæ feed upon other insects stored up for them, or upon fluids provided by the neuters; and the MELLIFERA, in which the larvæ feed upon honey or pollen-paste stored up for them. The adult forms of all these are distinguished by certain technical peculiarities, which it would be tedious here to specify.

Section I. TEREBRANTIA.—The principal family of the Phytophagous Terebrantia is that of TENTHREDINIDÆ, or *Saw-Flies*, so named from the saw-like character and action of the ovipositor. With this instrument, they make a succession of small holes in the branches or other parts of trees, in each of which an egg and a drop of frothy fluid are discharged, the latter of which closes the hole.

The family of CYNIPIDÆ, or *Gall-Flies*, placed on account of its structure in the Entomophagous division of the Terebrantia, is nearly allied in habits to some among the last group. The ovipositor does not seem capable of boring a hole by itself; but, being armed with teeth at its extremity, it can enlarge slits already existing, for the deposition of its eggs. The fluid accumulating in the wounded parts forms excrescences or tumours, which are commonly termed *galls*, *nut-galls*, or *gall-apples*. Their form and solidity vary according to the parts of the plants which have been attacked, and the species of the insect, of which each is restricted to a particular kind of plant.



Pimpla Manifestor engaged in oviposition.

The family of ICHNEUMONIDÆ may be regarded as peculiarly characteristic of the entomophagous division. The female deposits her eggs, by means of her sharp-pointed ovipositor, only in the bodies of other insects, chiefly the larvæ of caterpillars, on which the young may feed when hatched. Some of them have a very long ovipositor, which is used to insert the eggs into the bodies of caterpillars that live beneath the bark, or in the crevices of trees; whilst those which have this instrument short, place their eggs in or upon the bodies of caterpillars or pupæ to which they can obtain easier access. They do not confine themselves to these situations, however; but employ for the same purpose the eggs or pupæ, still preferring the larvæ when they can find them. The young Ichneumons, when hatched as footless grubs, sometimes in considerable numbers in the body of one larva, devour only the fatty parts, which are not absolutely necessary to life; but when ready to undergo their metamorphosis, they either pierce through the skin and escape, or else kill their victim, and perform their changes within its body.

Section II. ACULEATA.—The Hymenoptera of this division may usually be distinguished from the Terebrantia by the mode in which the abdomen is united to the thorax. In the *Borers*, it is in general closely jointed to it—a structure which is evidently necessary for providing the ovipositor with the requisite strength; whilst in the stinging Hymenoptera, it is usually connected by means of a peduncle or footstalk, which is often, as in some of the Wasp tribe, of great length and extremely slender. The predaceous division of this section contains several families, of which the most important only will be noticed in detail.

The CRABRONIDÆ, LARRIDÆ, BEMBECIDÆ, SPHEGIDÆ, SCOLIIDÆ, and MUTILLIDÆ, may all be considered under one general description. They form a group which may be termed that of *Fossores* or Diggers, from their peculiar habits; and they are commonly known as *Sand* and *Wood Wasps*. They are solitary in their mode of life, and consequently no neuters exist among them. In general, the females excavate cells in the ground, or in posts, timbers, &c., in which they deposit, together with their eggs, various larvæ, or perfect insects, and (in some species) even spiders, which are destined for the support of their progeny when hatched. Occasionally the insects composing this store are first stung to death; but sometimes they are only slightly stung, and are finally killed by the larvæ when hatched. In this manner they are rendered powerless; whilst their bodies are prevented from decomposing. The perfect insects are generally very active, and fond of the nectar of flowers, especially those of the umbelliferous tribe. They delight in the hottest sunshine, flying and running over sandbanks exposed to the mid-day sun, and keeping their wings in constant agitation; some of the tropical species are among the largest of the order, and their sting is very severe. The sand-burrowers excavate their nests by means of powerful brushes with which their legs are furnished; while the wood-burrowers use for this purpose their strong bread mandibles, which are provided with tooth-like projections.

The next family, that of FORMICIDÆ, is composed of the well-known and singularly interesting tribes of Ants, which are distinguished from all the Hymenoptera previously described, by their habit of residing under ground in numerous societies, and by the existence of *neuters* among them, by which class the labours of the community are chiefly performed. The males and females, which constitute but a small proportion of each community, are alone furnished with wings; the former are the smallest. The neuters are somewhat smaller than the males, and mostly resemble the females in conformation; but the thorax is much narrower and contracted in the middle, not having to give attachment to wings. The nests of Ants are differently constructed in the different species, but in all are very curiously and regularly arranged. The males and females leave them as soon as they have acquired their wings, and go forth together into the air. The males soon die, without entering their former abode; of the females some return, and deposit their eggs in the original nest, whilst others go off to a distance and become the foundresses of new colonies. They lose their wings at this period, sometimes stripping them off with their own feet, in other instances being deprived of them by the neuters.

The neuters not only construct the nest, but most carefully tend the young grubs, supplying them with food, moving them on fine days to the outer surface of the nest to give them heat, and carrying them back again at the approach of night or bad weather, and defending them when attacked by enemies. The winged

ants having all perished at the commencement of the cold weather, the neuters only survive the winter. Some of the neuters are larger and rather differently formed from the rest, and appear to be the chief defenders or soldiers of the community. A most remarkable instinct is observed in some species, that of making war upon colonies of smaller ants, carrying captive the larvæ and pupæ of the neuters, and keeping them in slavery when hatched. Ants are well known to be extremely fond of saccharine matters, and they seem greatly to relish the fluid which exudes from the bodies of Aphides and Coccidæ. Some species of ants collect Aphides, and keep them, as it were, in pastures, which they connect with their nests by means of galleries excavated along the stems and branches of trees; and they protect the eggs of these insects in their own nests, especially in bad seasons.

The foregoing are a few of the chief facts relating to the economy of this tribe, on which many volumes have been written; and it may be safely asserted that there is none whose habits are calculated to afford more of interest and entertainment to those who seek acquaintance with them, either by the recorded observations of others or by their own.

The family of Vespidæ, or *Wasps*, is distinguished from the other Hymenoptera by their wings being folded when at rest, throughout their entire length. In general these insects are social, the communities, however, being small. In such cases, there are neuters which are not destitute of wings. There are also some solitary species (whose habits resemble those of the Fossores, whilst their general structure is more conformable to that of the Social Wasps) among whom no neuters exist. The nests of the solitary species are formed of earth; they are sometimes concealed in holes of walls, in the earth, or old wood, and sometimes they are fixed to plants. The parents store them with caterpillars or spiders, which they have previously wounded with their stings. These nests contain a succession of cells, in each of which a single egg is deposited.

The best known of the Social Wasps, such as the common species of this country, construct their nests with bits of wood, bark, &c., which they separate with their jaws, and reduce to a pulp; and this, when expanded and dried, forms a paper-like substance. With this are built layers of hexagonal cells, one row being joined to the under side of another. The top row is attached, in some species, merely to the under side of a branch, or to the top of a slight hollow, by which it may be in some degree protected; but in others the whole comb is enveloped in a covering, formed by several layers of the same paper-like substance, with one or more apertures. Wasps feed, in their perfect state, upon insects, meat, fruit, &c., and nourish their young with the juices of these substances. A Brazilian species stores up an abundant provision of honey.

The Hymenoptera belonging to the *melliferous* or honey-collecting division of the Aculeata, are known by the peculiar conformation of the hind feet, of which the first joint is compressed and extended into the form of a square plate, and provided on its inside with brush-like tufts: these organs are employed for the purpose of collecting and carrying the pollen of flowers, which is employed for the nourishment of the young. All of these insects are commonly known by the name of Bees; but the tribe contains two families; in one of which all the species are solitary, and are of only two kinds—males and females; whilst the others mostly live in societies, but are chiefly distinguished from the former by certain peculiarities in the structure of the mouth.

Of the solitary Bees which construct nests for themselves, there are many curious varieties, some of which go under the names of Mason, Carpenter, and Upholsterer Bees, from the material with which they work—the first agglutinating bits of sand or gravel, the next excavating wood by means of their powerful jaws, and the last constructing their cells of portions of leaves. The habits of all of these may be studied in detail with extreme interest.

Of the social species there are two principal groups the Humble-Bees, or Wild-Bees, and the Hive-Bees. The common Humble-Bees of this country live in curious underground habitations, in societies usually of fifty or sixty, but sometimes of 200 or 300 individuals.

Queen-Bee.

Drone.

It is in the Hive-Bees that the arts of construction are exhibited in the most elaborate degree. Their societies consist of but one female, commonly termed the queen, several hundred males, which are known as drones, and about twenty thousand working bees or neuters. It is by the latter that all the labours of the hive, the construction of the combs, the collection of food, both honey for the adults and pollen for the larvæ, and the nourishment of the grubs, are performed. The accompanying figures exhibit the relative sizes and aspects of these three orders. The wax of which the comb is constructed is secreted by the insects themselves, in little scales, which work out from between the segments of the abdomen. These are taken up and kneaded by the jaws, and applied in the proper place. The drones are killed at the end of summer; but the queen and great part of the workers remain; and when, in the summer, they increase so much as to over-people the hive, colonies are sent forth with young queens, in search of another habitation.

Neuter Bee.

Order V.—Homoptera.

The insects contained in this order present many curious anomalies of structure and habit, and depart more widely from the general type than is the case in almost any other division of the class. Hence it is difficult to assign any general characters which shall include them all. It is in the structure of the mouth that there is the greatest agreement. This is adapted for suction, the tongue being elongated and channelled into a gutter, and being surrounded by delicate lancet-like organs which pierce the tissues of plants. All the insects of this group subsist on vegetable juices; and some of them, from the amount of damage they commit, are very injurious to the cultivator. Some of the females are furnished with an ovipositor, provided with several toothed saws; and with this they make incisions into the leaves or stems of plants, into which they introduce their eggs. The anterior pair of wings is usually similar to the posterior in consistence, both being composed of a firm membrane: that which chiefly distinguishes the Homoptera, however, from the Heteroptera, is, that the substance of the anterior pair, whatever be its nature, is the same throughout, and that, when folded, they are roof-like.

This order may be divided, like the Coleoptera, into sections, according to the number of joints in the tarsi. These sections are only three in number; in the first, Trimera, the tarsi are three-jointed; in the second,

DIMERA, they are but two-jointed; and in the third, MONOMERA, they have but one joint.

Section I. TRIMERA.—The three-jointed division of the Homoptera includes three families, of which two, the CICADIDÆ and FULGORIDÆ, are very interesting. The CICADIDÆ are the largest of the order; one species measuring between six and seven inches in the expanse of its wings. Their peculiar characteristic consists in their musical powers. By a peculiar apparatus situated beneath the abdomen, they are enabled to produce a continued sound, nearly monotonous, but of considerable power. In some species the sound is so loud and shrill as to be heard at the distance of a mile.

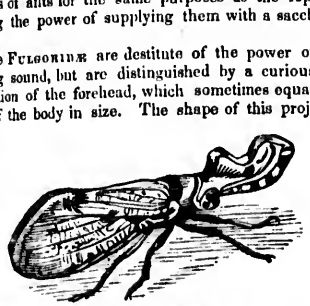
The family of CERCOPIDÆ, also belonging to this section, consists of insects of small size, but which are remarkable for the grotesqueness of the forms which many of them assume; some inhabit this country, and are known by the name of cuckoo-spits and frog-hoppers; but the most singular species are confined to the tropics. The curious appendages represented in the

Bocydium Globulare.

Bocydium Cruciatum.

accompanying figures of a Brazilian species, result from an extraordinary development of the first segment of the thorax. The insects of this family are often beautifully varied in their colours; they are constantly found amongst plants, and on trees, upon the juice of which they subsist, in all their stages. Of the best-known species of this country, the larva and pupa invest themselves with a frothy secretion, whence the vulgar name is derived. Some of this tribe are employed by certain species of ants for the same purposes as the Aphides, having the power of supplying them with a saccharine fluid.

The FULGORIDÆ are destitute of the power of producing sound, but are distinguished by a curious prolongation of the forehead, which sometimes equals the rest of the body in size. The shape of this projection



Fulgora Laternaria.

differs extremely in the various species, which are very numerous. It is in it that the luminous property of the *lantern-fly* is said to exist; but the luminosity of this insect, of which one species is a native of Brazil and Guiana, whilst another inhabits China, is doubted by many naturalists. If it really exists, it probably only shows itself at particular seasons.

Section II. DIMERA.—Of the Dimerous Homoptera, the most remarkable family is that of APHIDÆ, commonly known as *Plant Lice*, which is extremely obnoxious on account of the injuries committed by its members against almost every kind of vegetable. The Aphides live in great numbers upon the surface of the plant, and suck the juices by means of their proboscis, from the young shoots, leaves, stems, and even roots. They thus greatly weaken its vigour, and often distort young shoots and leaves; some species cause little gall-like excrescences by the irritation they produce. From two horn-like processes at the posterior part of the body, a saccharine secretion exudes, of which ants are very fond; and it is either this fluid dropped on the adjacent leaves, or the extravasated sap flowing from the wounds made by the insects, which is known under the name of honey-dew. In many of the species of this family a large proportion of the individuals never acquire wings, in which case the pupa is not to be distinguished from the mature larva or imago states, whilst at certain parts of the year, other individuals of the same species and of both sexes acquire wings. The wingless Aphides, which may be seen in the spring and early summer, are all females capable of producing fertile eggs, and from these are reared the winged males and females which are seen later in the season. Their rapidity of production is enormous, nine generations having been obtained within three months. The young are sometimes produced alive, whilst in other cases (according to the season and other circumstances) eggs are deposited. Many of the *blights* so injurious to the gardener and the agriculturist, consist really of Aphides, although, from the minuteness of the insects themselves, they often escape observation.

Section III. MONOMERA.—The third section contains but one family, that of COCCIDÆ, sometimes called *Scale Insects*. These, although ordinarily of very small size, are amongst the most injurious to vegetation of any tribe. Their powers of propagation are excessive, and when they once gain possession of a plant or young tree, its death is almost certain, the minute size of the larvæ rendering it impossible to exterminate them. They furnish, however, some very important products. The bodies of many species are very deeply coloured through their whole substance, and yield dyes of great value, the richness of which seems to depend upon the nature of the plant on which they feed. The species employed by the ancients was a native of the Levant; but that which furnishes the *cochineal* so highly valued at the present time, was originally confined to Mexico, where it feeds on the cacti; it has, however, been introduced, along with its proper food, into Spain and Algiers, and also into the hot-houses of this country. About 800,000 lbs. weight of cochineal are annually brought to Europe, each pound of which contains about 70,000 insects. The lac of the East Indies, which is extensively used in the composition of varnishes, the making of sealing-wax, &c., is the product of another species of Coccus.

Order VI.—Heteroptera.

These insects bear a close general resemblance to those of the last order; as in them, the structure of the mouth, which is wholly adapted for suction, indicates that their nourishment consists solely of the juices of plants or animals; but they are at once known from them by the character of the anterior pair of wings, which are coriaceous at the base, and membranous towards their point, and which fold nearly horizontally, partly lapping over each other. By far the greater number of them feed upon the juices of plants, but some of them prey upon other and weaker insects, and a few species (of which the numbers, however, sometimes multiply to a great extent) suck the juices of larger animals. The majority of this order are found in tropical climates, and the species which inhabit these regions are mostly ornamented with a great variety of beautiful colours and markings, often vyeing with the most splendid of the Beetle tribes. Many species, however, are of aquatic habits, and they are all of an obscure black colour. Nearly all the terrestrial species have the power of emitting, when suddenly alarmed or touched, a powerful odour, which is of a pleasing character in some species, but in others (as the common bedbug) very disgusting

Others seem to eject a poisonous fluid into the wound they make for the purpose of suction. In some species the wings are altogether undeveloped, or the upper pair is wanting. The insects of this order continue active, and require food, during all the stages of their existence. They may be divided into two sections, distinguished by their residence—the Geocorisa, or Land Bugs, and the Hydrocorisa, or Water Bugs.

The first section contains a large number of families, nearly all of which bear a considerable resemblance to that which includes the common Bugs, the Cimicidæ. Some of the tropical species attain considerable size, being described as of the bulk of a cockchafer, and they are much dreaded by the inhabitants of the regions they infest. Many of the Geocorisa, however, are vegetable feeders, and it is among these that the most brilliant colours are exhibited. Some of them, belonging to the family Hydrometridæ, are distinguished by their power of moving on the surface of standing or running waters.

Of the true Water Bugs, there are two families only. The Notonectidæ live almost entirely in the water, where they feed upon other aquatic insects; these they seize by means of their fore legs, which are formed as claws. The two hinder pairs have a fringe of bristles along their edge, by which the surface with which they strike the water in swimming is greatly increased. Their general form is extremely well adapted for rapid progression in water; and, from the peculiar aspect of the body, they have received the name of *boat-flies*. The insects of this family swim on their backs, a peculiarity to which their name refers; and the arrangement of all their organs has reference to this position. When stationary at the surface of the water, as is much their custom in still hot weather, they very quickly obtain intelligence of the approach of danger, by means of their eyes, which are so placed as to be able to see both above and below; and then, by a single stroke of their paddles, which are ordinarily stretched out at full length, they descend out of sight. Their motions are very quick in the element they chiefly inhabit, while on land they are scarcely able to walk. They fly well. The larvæ and pupæ differ from the imago only in their smaller size, and in the deficiency of wings. The Notonectidæ carry down a supply of air for respiration beneath the wings. The Nepidæ are in most respects similar in structure and habits to the insects of the last family. Their motions, however, are much slower.

Order VII.—Lepidoptera.

The order Lepidoptera, characterized, as formerly stated, by the downy covering of the wings (which is composed of minute scales, arranged with great regularity upon the membrane itself), contains some of the most beautiful forms of the whole class, as well as some of the largest. The number of species it comprehends is probably as great as that of any other order except the Coleoptera, and may probably rank as about one-fifth or one-sixth of the whole class.

All the insects of this order belong to the well-known forms of *Butterflies* and *Moths;* and there is so much general resemblance among them, that the difficulty of classifying them is often considerable. The possession of scales upon the wings is not altogether peculiar to them; for they are found on the wings and bodies of other insects. But it is only in these that the wings are covered with such complete layers of them. The scales are generally of somewhat oval form, terminating at one end in a kind of stalk, by which they are attached to the membrane of the wing; and on this they are arranged in rows, overlapping each other, like tiles on a roof. They may be easily rubbed off with the finger; and the bare membrane is left, which is then seen to correspond with the wings of other insects. The number of scales covering the wings of the silk-worm has been estimated at about 400,000. It is entirely to the scales that the colours of the wings are due; and sometimes these are so brilliant, as to be almost painful to look upon, if a strong sunlight is reflected from the surface. In some species the wings are partially, or even almost entirely destitute of scales.

The Lepidoptera, in their perfect state, are formed to exist entirely upon fluid nutriment, which they suck up by means of a long trunk, which is usually coiled up spirally under the head. This trunk is not an organ altogether peculiar to them, however; for it is constructed out of the lower pair of jaws or *maxillæ*, which are very much prolonged; each is channelled on the side nearest the other, and furnished with very closely set teeth along its whole edge; when the edges are brought together, and the teeth lock into one another, a perfect tube is formed by the junction of the channels in the two, and through this canal these beautiful insects suck up the juices of flowers. All the other parts of the mouth usually possessed by insects, may be detected in that of the Lepidoptera, but in a different state of development. The antennæ are variable in size, and always composed of a great number of joints. The eyes are usually large, and contain a considerable number of facets.

The curious phenomena of the metamorphosis are presented to our notice more remarkably, perhaps, in this order than in any other. All the beings commonly known as *Caterpillars*, are the larvæ of Lepidoptera. They are produced from eggs of various forms and curious markings (sometimes almost resembling Echini), which have been deposited by the parent upon the leaves that are to serve as the food of the larvæ when hatched.

The three first segments of the body have each a pair of simple, short, and jointed feet, which are the rudiments of those of the perfect insect. Behind these are a variable number of temporary appendages, called pro-legs, which are thick, short, fleshy limbs, armed at their extremity with a great number of minute hooks, and furnished with powerful muscles. There are usually five pairs of these—four of them succeeding the true legs, and another arising from the last segment of the body. Those possessing pro-legs on nearly every segment, crawl upon all the feet at once, after the manner of the Myrapoda; but those which have only a small number of pro-legs, adopt a different method. They seize fast hold of the objects on which they are stationed with the six true legs at the fore part of the body, and then elevate the intermediate segments into an arch, until they bring the pro-legs behind close to the others; they then disengage the true feet, and retaining hold with the pro-legs, thrust the body to its full length, and then recommence the same manœuvre. These are called Loopers or Geometers. Many of them resemble, in their forms and colours, as well as in their mode of standing fixed for a great length of time by their hind legs only to twigs, and small pieces of stick.

The greater number of caterpillars are vegetable

Caterpillar and Chrysalis of the Magpie Moth.

feeders, and are mostly confined to the leaves; and the correspondence between the development of the leaves and flowers of plants on the one hand, with that of the caterpillars and butterflies which are respectively to feed upon them, cannot but strike every one as a beautiful instance of creative foresight. But there are some caterpillars adapted to feed on flowers (such as come forth early in the year); and others attack seeds, roots, and even the woody portion of the stem. Moreover, there are a few which live in this state upon animal matter, such as wool, hides, leather, and fat. Many can digest a considerable variety of alimentary materials; while there are others that can only find support on some one kind, the leaves of some particular species of plant, for example.

The habits of Caterpillars are extremely various. Some burrow into the substance of leaves, in which they excavate galleries; others envelop themselves in the membrane of the leaf itself. Many construct cases or sheaths, either fixed or portable, by agglutinating various substances together; and there are some which live in societies, living together under a tent of silk which they spin in common, and which serves to defend them from the inclemency of the weather. They usually throw off their skin four times before undergoing the transformation into the chrysalis state. For this they prepare by spinning a *cocoon*, in which they are enclosed during the greater part of that epoch. Some construct this entirely of silk; others attach together portions of leaves or particles of earth by silken threads. These threads are formed by a glutinous secretion from glands which seem analogous to the salivary glands of other animals; and these being forced out through a small opening at the end of the lip, hardens as it dries in the air. There are some caterpillars which form no cocoon, but which are contented with suspending themselves by the attachment of the hinder part of the body to some solid support, or by a silken thread coiled around them. The *chrysalis* or nymph has the whole body enclosed in a tough envelope, under which, however, the form of the parts of the future insect may be discerned. At the moment of the final transformation, it discharges from its intestine a red liquid, which softens one end of the cocoon, and allows the exit of the moth. Generally one end of it is weaker, or even fitted by the arrangement of the threads for the escape of the insect.

The *Butterfly*, when it throws off its last envelope and comes forth into the air, of which it is henceforth to be one of the gayest inhabitants, is not altogether perfect, although capable of very soon becoming so. The wings appear at first very slightly developed, and hang loosely by the sides; and it is not until the animal has injected their tubes with air, by taking several full inspirations, that they become expanded so as to serve for flight. From that period, the body is supported by them during by far the greatest proportion of their active state.

The order of *Lepidoptera* is usually divided into three sections, which are different alike in their conformation and habits. These are—1. The Diurna, or *Butterflies*, which may be at once recognised by the vertical position of the wings during repose; 2. The Crepuscularia, or *Twilight-Moths*, commonly known as *Hawk-Moths*, in which the wings are horizontal in repose, and the antennæ thick or club-shaped; 3. The Nocturna, or true *Moths*, whose wings are also horizontal or inclined in repose, but whose antennæ are more slender, tapering gradually from the base to the point.

Section I. Diurna.—The first section corresponds with the Linnæan genus *Papilio*, which is now, however, very much subdivided. The butterflies are distinguished from other Lepidoptera by the brilliancy of their colouring, and by the beauty of the under as well as of the upper side of the wings. Their caterpillars have generally sixteen feet, and their pupæ are nearly always destitute of any silken envelope, and are attached by the tail. The antennæ of Butterflies are sometimes knobbed at their extremities, sometimes of the same thickness throughout, and sometimes taper gradually from base to point. This section may be divided into three families, according to peculiarities in the metamorphosis.

Section II. Crepuscularia.—The section of Crepuscularia, or *Hawk-Moths*, corresponds with the Linnæan genus *Sphinx*, which derived its name from the peculiar attitudes (resembling that of the sculptured sphinx of antiquity) into which the larva sometimes throws itself. Although the Lepidoptera arranged under this division, on account of their similarity of structure, are mostly twilight-fliers, it is not the case with all; for there are some which come abroad in open daylight, and suck the juices of flowers with their long trunks, while the sun is brightly illumining their wings. These species are observed to be more brilliantly coloured than the rest. In most of the Sphinges the body and wings have a dull brownish-gray aspect, like that of many owls, whose habits are similar. The wings are more downy in appearance than those of the Butterflies, as if the scales did not lie so closely upon each other. The larvæ of the Crepuscularia have always sixteen feet, and their pupæ are either enclosed in a cocoon or bury themselves in the earth. The Hawk-Moths make a loud humming noise in their flight.

One of the most remarkable of this group is the death's-head moth (*acherontia atropos*,) recognised by the

Acherontia Atropos.

skull-like patch on the back of the thorax. This emits a squeaking kind of sound, sometimes rather loud, but upon the mode in which it is produced entomologists are not agreed. In consequence of the peculiar aspect of its body, the sudden appearance of this insect in large numbers has been popularly regarded as ominous of evil. It is a great enemy to bees, and enters their hives undefended, devouring the honey, and alarming the inhabitants so that they seem to keep aloof from it.

Section III. Nocturna.—The group of nocturnal Lepidoptera is by far the largest of the order. In general aspect, Moths and Sphinges are somewhat alike, but they may be at once distinguished by the form of the antennæ, which, in the latter, gradually taper from the base to the point. Many of them have no distinct trunk, and in some species the females are almost or altogether destitute of wings. In general, these organs assume a horizontal or inclined position, and are connected in the same manner as in the Sphinges. Sometimes they can be rolled round the body, and in a few instances they fold longitudinally like a fan. The greater part of these Lepidoptera fly by night, and their colours are usually dull. Their caterpillars vary as to the number of legs from ten to sixteen, and their pupæ are of rounded form without those angular projections usually seen in those of other families, and almost always spin a cocoon. The large number of species belonging to this section, and the general similarity of their form, make their classification a matter of much difficulty. They have been divided into ten families, of which a few of the most important will be particularly noticed.

The tribe of Bombycidæ consists of Moths allied to that of the common silk-worm. The pupæ are enclosed

in cocoons of pure silk, frequently of very firm texture; and are rarely subterranean. The prevailing hues of these Moths are gray or fawn colour; and many of the larger species have the wings ornamented with eye-like spots. This tribe contains the largest species of Lepidoptera. The *Saturnia pavonia major*, found in France, has been seen to attain the breadth of five inches; and the *S. pavonia minor*, or emperor moth, attains in this country the breadth of three inches and a half. It is believed that the silk formerly obtained from China and India proceeded from the caterpillars of this genus. Many of them are remarkable for the contrivances they adopt for security in the chrysalis state; and among the most so is the *S. promethea*, an American species, which, previously to spinning, draws together the sides of a leaf (within which it afterwards forms its cocoon), and fastens its stalk to the stem by a strong silken web. The genus *Bombyx* is an extremely important and interesting one, as it is by the caterpillar of the *B. mori* that all the silk now employed in Europe is produced. The larva feeds especially upon the mulberry, although it may be grown upon other plants; but as the silk produced by the former is preferable, that tree is grown to a great extent in Italy and the south of France, where the breeding of silk-worms is carried on. The quantity of nutriment they require is enormous in proportion to their original size, but probably not greater than that consumed by other caterpillars. The care bestowed upon them, however, draws attention to the fact. The larva is reckoned to weigh, when first hatched, about one-hundredth of a grain; previously to its metamorphosis it increases to ninety-five grains, or 9500 times its original weight. It is reckoned that, for the larvæ proceeding from *an ounce* of eggs, nearly *two thousand pounds* of leaves are requisite. The caterpillars of another species of Bombyx are very remarkable for their curious habits. They live in societies on the leaves of the oak; and spin, when young, a kind of silken tent, divided within into cells. They may be seen to issue from it in the evening in procession. One of them advances at the head, and seems to act as a guide; two then follow; next three; then four; and so on, each rank containing one more than the preceding one. Hence they have been called processionary caterpillars. Each spins a separate cocoon; but they are united in regular apposition, laid side by side against each other.

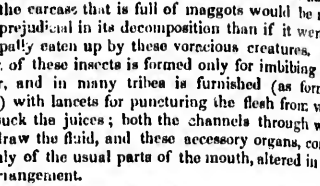
The family of TINEIDÆ contains those little moths which are so injurious to woollen stuffs of every kind, as well as to furs, skins, feathers, and other objects of natural history, upon which their voracious larvæ feed. They use the same materials also for the construction of their movable cases or sheaths, which they enlarge with the increasing size of their bodies, both by adding to their extremities, and by slitting them along and inserting a new piece, so as to increase their diameter. In these tubes they undergo their metamorphosis, after closing the orifice with silk.

The FISSIPENNÆ are distinguished from all other Lepidoptera by the division of the membrane of the wings into branches or rays, of which each pair has from two to six. These are most beautifully fringed at their edges, and much resemble the feathers of birds. The rays are composed of the nerves, without any of the usual intervening membrane, which seems to be transformed into the fringe. These insects (commonly known by the name of Plumed Moths) are of small size: some of them are diurnal and brightly coloured; others are twilight fliers, and of a duller aspect. Some species have the power of folding up their wings, one ray against another, somewhat like a fan; so that when closed they present the appearance of a single broad ray.

Order VIII.—Diptera.

The Two-Winged Insects constitute one of the most extensive orders of the whole class, not only in regard to the number of distinct species, but also from the swarms of individuals of the same species. Many of them, also, have been constant attendants upon man in all ages. They do not attract attention from their size, however, for there are few that exceed an inch in length; nor is it on account of their beauty, for the majority of them are of dull colours; their forms, too, are rarely elegant, and the transformations of many are unknown. They owe the notice they have attracted chiefly to their habits, and especially to those which affect man and the domestic animals, both in their perfect and early states. However annoying these are, it must not be forgotten that other Diptera are of extreme service, by cleansing the surface of the earth of vegetable and animal impurities; the carcass that is full of maggots would be much more prejudicial in its decomposition than if it were not principally eaten up by these voracious creatures. The mouth of these insects is formed only for imbibing fluid matter, and in many tribes is furnished (as formerly stated) with lancets for puncturing the flesh from which they suck the juices; both the channels through which they draw the fluid, and these accessory organs, consisting only of the usual parts of the mouth, altered in form and arrangement.

The Diptera all undergo a complete metamorphosis, as far as the structure of the larvæ is concerned; these



Stratiomys Chameleon—Larva, Pupa, and Imago.

being generally cylindrical footless grubs, no representatives of legs being found except in a few species. But in many there is no proper transformation into the pupa state, the skin of the larva, which hardens, contracts, and shortens, becoming, as it were, the cocoon for the chrysalis. The body is detached from its interior, leaving the organs peculiar to the larva, such as the parts of the mouth, adherent to the inside of the skin. Shortly afterwards, the enclosed being assumes the form of a soft and gelatinous mass, without any of the parts of the future insect being visible; some days subsequently, however, these organs become distinct, and the insect has then assumed the real state of pupa, though without having yet thrown off its larva skin. When ready to escape, it scales off the anterior end of its case like a cap. Many larvæ, however, do throw off their skins when assuming the pupa state, and some spin a regular cocoon. The duration of life in the perfect state is usually very short.

In subdividing the order, we first separate from it a small but remarkable group, which forms the transition to the more aberrant orders of the class, especially the Aphaniptera. Some of them are entirely destitute of wings, and yet in their general structure correspond with the Diptera. They are distinguished from all other insects by their curious mode of reproduction. Not only are the eggs hatched within the body of the parent, but the larvæ are retained there, until they have been transformed into pupæ, in which state they come forth into the world. Hence the group has received the name of PUPIPARA.

The remaining Diptera constituting by far the largest proportion of the class, may be divided into four sections. In the first, NEMOCERA, the antennæ are composed of more than six joints, whilst in all the remainder, the antennæ are short, having apparently more than three distinct joints. In the second, NOTACANTHA, the last division of the antennæ is really composed of two; the proboscis does not project much from the mouth, and is furnished with only two lancets. In the third, TANYSTOMA, the antennæ have really only three joints, the last being usually terminated by a *seta* or bristle. And in the fourth, the ATHERICERA, the antennæ are only two or three jointed, and the proboscis is withdrawn into the mouth.

Section I. NEMOCERA.—To the Nemocera belong the two families of CULICIDÆ and TIPULIDÆ, the former known as the *Gnat* tribe, the latter as the *Harry-long-legs*. The former are distinguished by their beautifully tufted antennæ. Gnats are well known to abound chiefly in damp situations; the reason being that their larvæ are inhabitants of the water. In this state they are very active, swimming with great agility, and often descending, but coming to the surface to breathe, which they do head downwards; the respiratory orifice being at the end of the tail. When the final transformation occurs, the skin of the pupa, which is being cast, serves as a kind of raft, which prevents the perfect insect from being immersed in water. The musquitoes which infest many countries, especially in warm latitudes, differ but little from the common gnats. They sometimes appear in such swarms, especially in marshy districts, as to be kept off only by fire.

Section II. NOTACANTHA.—The second section of the Diptera contains three families, STRATIOMIDÆ, BERIDÆ, and CŒNOMYIDÆ, which do not attract much attention, although some of the insects contained in them are very abundant. They are mostly small, but gaily-coloured insects, and are most numerous in moist situations, in which the larvæ are generally produced. They mostly feed upon vegetable rather than animal juices.

Section III. TANYSTOMA.—The insects composing the third division have usually a more perfect mouth than those of the other sections; and they are also remarkable for the structure of the head of the larvæ, which possess two claw-like appendages, by which they attach themselves to the substances from which they derive their support. Many of the perfect insects are eminently carnivorous or insectivorous, so are also some of the larvæ. To this group belongs the family of TABANIDÆ, the Gad-Fly tribe, to which belong the largest Dipterous Insects, pre-eminently distinguished for the tormenting powers which the different species possess, by piercing the skins and sucking the blood of various quadrupeds, and even of man himself.

Section IV. ATHERICERA.—The insects of the fourth tribe of Diptera are principally vegetable-feeders in their perfect state, only a few being carnivorous, or feeding on other insects; but their larvæ are generally extremely voracious, and will devour almost any kind of soft animal matter. This section includes the Flies strictly so called, the Bot-Flies, and many other tribes.

The first family, that of SYRPHIDÆ, bears an extremely close resemblance to the humble-bees and wasps, in the nests of which some species of them deposit their eggs; others lay them among Aphides, which fall an easy prey to the larva when it is hatched. The perfect insects are very partial to flowers, preferring the Compositæ; and they delight to hover immovably over certain spots, to which they will return, if disturbed, a considerable number of times. Above a hundred species inhabit Britain. In a few species, the larvæ are aquatic, and the posterior part of the body is prolonged into a respiratory tube, whence they have received the name of rat-tailed larvæ. The imago of one of these closely resembles in size and colour the male of the hive-bee.

The form and habits of the family MUSCIDÆ, or *Fly* tribe, are generally known; the family is an extremely numerous one, above 1700 species having been recorded as existing in Europe, of which about half are indigenous to this country; and there are probably at least as many more which have not been described. The strong general resemblance which exists among all the species, makes it very difficult (especially when their small size is considered) to discriminate them readily. The larvæ of these insects, commonly known as *maggots*, are soft, vermiform, footless grubs, possessing on the head a couple of retractile hooks, by which they can cling to the substances on which they feed. They devour various substances, both animal and vegetable, living, recently-dead, or far advanced in putrefaction. The eggs are deposited by the female, as in other instances, in the neighbourhood, or in the very substance, of the food which is adapted for the support of the larva, however little to its own liking.

The ŒSTRIDÆ, or *Bot-Flies*, are a family very remarkable in regard to their structure and habits. The perfect insects resemble large meat-flies in form, are very hairy, and generally have these hairs coloured in rings, like humble-bees; but they are seldom seen, the duration of their lives being very short in this condition. Their chief peculiarity consists in the absence of any proper mouth in the imago (in which respect there is an analogy with the Strepsiptera), and in the peculiar habitation of the larva. This is always found in living animals; its situation, however, varying with the species, of which almost every herbivorous mammal has one or more peculiar to it. The egg is deposited by some in situations where the larva may burrow into the flesh, where it occasions inflammatory tumours, the fluids contained in which afford it nourishment. In other cases, the eggs or larvæ, existing upon spots which the animal is in the habit of licking, are conveyed by the tongue into the mouth, whence they pass into the stomach. There they remain until full-grown; and then they quit the body (as do also those that inhabit the flesh) and fall to the ground, beneath the surface of which they undergo their transformations. The larvæ of one species, which inhabits the sheep, are found in the cavities in front of the bones of the skull and higher parts of the nose. Man is subject to the attacks of one or more species, which do not, however, infest this country.

The Pupiparous division of the Diptera contains two families, the HIPPOBOSCIDÆ and NYCTERIBIIDÆ, the habits of all the species of which are parasitic. The former, sometimes termed *Forest-Flies*, are of small size, covered with bristles, and sometimes destitute of wings. They are known by the French under the name of Spider-Flies. They reside upon quadrupeds and birds, running with great agility, and often sideways, burying themselves among the hair or feathers. That which is parasitic on sheep is known as the *tick*. The minute species infests the hive-bee; and this is remarkable not only for being destitute of wings, but of eyes also. In the other family, that of NYCTERIBIIDÆ, the general form more nearly approaches that of the spiders. It contains but few species, all of which are parasitic upon bats, and are commonly termed *bat-lice*.

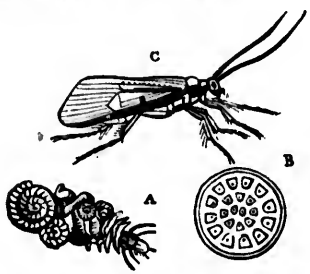
Order IX.—Trichoptera.

This order is a very small one, and consists but of one tribe, the PHRYGANEIDÆ, which have been commonly associated with the Neuroptera. But there seems good reason for ranking them as a separate order, connecting the Neuroptera with the Lepidoptera, for they resemble the latter in the distribution of the nerves of the wings and in the hairy covering with which both the wings and bodies are beset, as well as in many other characters.

The larvæ, well known under the name of *caddice-worms*, reside in cylindrical cases, open at each end, to

which they attach various matters, as bits of stick, weeds, pebbles, or even small living shells, by the assistance of silken threads, which they spin from the mouth in the same manner as caterpillars. These cases they bear about with them, protruding the three first segments, with their legs, when they creep forwards, and withdrawing these upon the slightest alarm: they never quit the cases of their own accord. Different species appear to prefer different materials for the construction of their cases, but they have the power of employing almost any which fall in their way, when those they prefer are deficient. The food of some of the larvæ is vegetable, but others prey upon smaller aquatic larvæ, such as those of Neuroptera.

When about to assume the pupa state, the larvæ fix their cases to some solid substance beneath the water, and close the two extremities with a kind of grating, that admits of the passage of water through the tube, which is necessary for respiration. When nearly arrived at their perfect form, they make their way out by the pair of hooked jaws with which they are then furnished, and swim about with great activity by means of the two hind legs, crawling also upon the four first.



Phryganea Grandis.
A, Larva in its case; B, Grating; C, Imago.

Order X.—Strepsiptera.

This is a small order, containing only a single group of insects; but these are so anomalous in structure that it is not merely impossible to associate them with any other order, but it is even difficult to assign their proper place in the class. As they possess less of general interest than of curiosity to the scientific naturalist, they need not here be treated of.

WINGLESS INSECTS.

Besides the foregoing orders, which constitute the true Insects, three others must be included in the class, on account of the correspondence in their general structure, although they present only one or neither of the two characters which have been stated to distinguish it—the presence of wings in the perfect state, and the metamorphosis. These three orders are, the Aphaniptera, or *Flea* tribe, which have the rudiments of wings, and undergo a metamorphosis; the Parasita, or *Louse* tribe, which is entirely destitute of wings, and undergoes no metamorphosis, but agrees with the true Insects in having only six legs; and the Thysanoura, including the *Spring-tails*, in which there are appendages to the abdomen, representing the legs of the posterior segments, so that these may be regarded as approaching the Myriapoda.

Order XI.—Aphanipters.

This order contains only one family, the Pulicidæ, or *Flea* tribe, all of which are insects of minute size, and, like the Diptera (to which they are perhaps most nearly allied), of suctorial habits. Their larvæ come forth from the egg in the form of minute worms, possessing considerable activity, and feeding upon animal matter, a provision of which seems to be formed for them by the parent. They afterwards enclose themselves in a small cocoon of silk, which is often covered with dust, and in this they undergo their change into the pupa state. In their perfect state, the rudiments only of wings are visible, in the form of little scales, attached to the second and third segments of the body, in which there is no proper distinction of thorax and abdomen.

Order XII.—Parasita.

The insects of this order, the *Louse* and its allies, are regarded with the greatest disgust by the common consent of civilized man, because their presence on the body is an indication of a gross want of cleanliness of habit. Most of the lower animals, however, are infested with one or more species, from the attacks of which they are not able to defend themselves; and man is subject to a peculiar disease which seems very much to favour their production. Their generations succeed each other very rapidly. The Parasita are almost entirely destitute of eyes.

Order XIII.—Thysanoura.

In the insects of this order there is a remarkable diversity of structure, especially in regard to the mouth. Some of them possess as complex an oral apparatus as the mandibulate insects, while in others there is scarcely a perceptible opening. The same is the case with regard to the eyes; these organs being fully developed in some, and almost rudimentary in others. The order contains two families. In the first, the Lepismidæ, the abdomen is furnished on each side with a row of movable appendages, like false legs, and is terminated by long jointed bristles, of which three are more remarkable. These little insects leap very well; some frequent stony places, while another is found in sugar, and is known as the *sugar-louse*. In the Poduridæ, the appendages to the sides of the abdomen are wanting; but the extremity of it is prolonged into a forked tail, by which these insects can execute very surprising leaps; this, when in inaction, is applied against the belly. From this conformation they are popularly known under the name of *Spring-tails*.

Podura Villosa.

CLASS VII.—ARACHNIDE.

The class of Arachnida, including the *Spiders* and their allies, was for a long time confounded with that of Insects, and has been only recently separated. The characters which they present are perfectly distinct from those either of Insects on the one hand, or of Crustacea on the other; nevertheless they present numerous relations with both those groups.

The Arachnida may be distinguished from Insects by the absence of any division between the head and thorax; and the compound mass thus formed is termed the cephalo-thorax. Again, Insects in their mature state are always provided with six legs and no more; the Arachnida have eight of these members. Moreover, the eyes are not compound, but more resemble those of higher animals. From Crustacea they are separated by the softness of their bodies (in which respect, however, they are approached by certain Macrourous Decapoda termed Spider-Crabs), but still more completely by their exclusively atmospheric respiration. The organs by which this function is performed vary in different tribes. In the *Acari*, or Mites, and their allies, they resemble the trachem of insects, and are distributed through the body; while in the Spiders, Scorpions, &c., they consist of rounded cavities, or air-sacs, into which the air is admitted by spiracles situated on the abdomen, and which are

lined by a membrane plaited into numerous folds, which resemble gills, and lie in opposition like the leaves of a book. On this character is founded the subdivision of the class into *pulmonary* and *tracheary* Arachnida.

The majority of the Arachnida feed upon insects, which they seize alive, or upon which they fix themselves, and from which they suck the juices. Others live as parasites upon the bodies of vertebrated animals. There are some, however, which are only found in flour, cheese, and upon various vegetables. These last, which mostly belong to the tracheary order, exhibit an affinity to Insects not only in their structure but in their metamorphosis; for they undergo great changes after they come out of the egg, an additional pair of legs being often developed; while in the others nothing else than a moult or casting of the skin occurs.

Order I.—Trachearia.

The Trachearia, being the most nearly allied to Insects, are naturally the first to be considered. This order contains several remarkable forms, of which the one best known is that of Acaridæ, or Mites, the majority of the species of which, however, are very minute, or almost microscopical. They are very extensively distributed; some being wanderers under stones, leaves, the bark of trees, in the ground, or upon articles of food; while others subsist as parasites upon the skin and in the flesh of different animals, often greatly weakening them by their excessive multiplication. There are some species which infest insects, especially the carrion beetles. Some of this tribe much resemble spiders in form and habits.

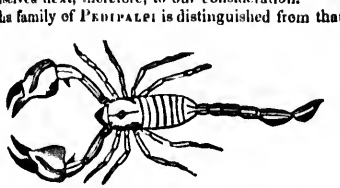
Acarus Domesticus magnified. (Mite.)

Besides the *Acari*, which form the principal part of this order, there is a curious group, which has received the name of *Pseudo-Scorpions*, owing to their possession of a pair of large claws terminating in forceps, which, like those of the true scorpions, are formed by an excessive development of the organs which in insects are termed palpi. There is also a very curious family, which some naturalists have separated into a distinct order, the *Pycnogonides*; these are distinguished by the absence of all special respiratory organs, and in their aquatic habits bear a strong resemblance to Crustacea. They are found among marine plants, and under stones on the beach. Their motions are remarkably slow; and they are said to live chiefly upon the animals of Bivalve Mollusca.

Order II.—Pulmonaria.

In this order, the respiration is performed by means of air-sacs contained on the under-side of the body, and opening externally by stigmata; sometimes these apertures are eight in number, four on each side, but sometimes four, or even only two. This diminution appears to indicate a gradual elevation in the character of the apparatus; leading us from the diffused condition in which it exists in Insects, to the more concentrated form it presents in higher animals. The Scorpions possess eight breathing-pores; and thus approach nearer to the Tracheary Arachnida than do the Spiders. They offer themselves next, therefore, to our consideration.

The family of Pedipalpi is distinguished from that of Araneidæ principally by the great development of the palpi, which form extended arms, terminated by a pincer or claw. The entire body is clothed with a hard skin. In the *Scorpions*, which constitute the principal part of this family, the abdomen is very much prolonged, forming a sort of tail, which is terminated by a sting furnished with a venomous secretion. The wound of this sting, although very painful, does not seem to be ordinarily dangerous. A small species inhabits this country; but it is between the tropics that the Scorpions attain their greatest development. They usually live on the ground, hiding themselves under stones or other bodies, among ruins, where such exist, and dark and cool places generally, even the interior of houses. They run quickly, and curve the tail over the back. They can turn it as an arm of offence or defence.

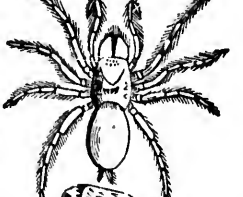


Scorpio Occitanus.

Besides the Scorpions, there is included in this family the tribe of *Tarantula** Spiders, which seem intermediate in several respects to the Scorpions and true Spiders.

The other family of the pulmonary Arachnida consists only of the Spiders of various kinds, and is designated Araneidæ. In these, the palpi are not developed to any thing like the same degree as in the Scorpion tribe; they rather resemble feet; but the jaws are armed with sharp and hooked fangs, and are perforated near their points, for the emission of a poisonous secretion provided for the destruction of their prey. Nearly all of them are provided with organs, situated at the hinder part of the body, for spinning a very delicate silken thread; but the use to which it is to be applied varies in different species. In some it forms webs in which are entangled the insects on which they feed; in others, it is employed to make a delicate silken tube, which lines their habitations; and in others, it is chiefly used for the fabrication of a sort of cocoon with which the eggs are surrounded. The instruments by which this thread is produced are little teat-like protuberances, termed *spinnerets*, of which four usually exist at the posterior extremity of the abdomen. Each of these, when highly magnified, is found to be perforated at its extremity by innumerable orifices of extreme minuteness, through which is forced out a glutinous fluid, secreted by glands within. This fluid soon hardens by exposure to the air; and thus each thread, delicate as it may seem, is composed of several hundreds, of extreme minuteness, coiled together, so that it possesses great strength in proportion to its diameter.

The Spiders are all extremely voracious in their habits, feeding only upon prey which they have themselves killed. When they have got an insect between their claws, either by entrapping it in their web or by their stealthy mode of pursuit, they plunge their poisoned mandibles into its body, and the bite is usually soon fatal. Sometimes, however, the insect has strength enough to resist its enemy, and to prevent the infliction of the fatal wound; and, as a prolonged struggle might be very injurious to the spider, on account of the softness of its body, it generally retires from the contest if not speedily successful. Where its prey has been entangled in its web, however, the spider still further encloses it by a silken thread, and then retires until the insect has lost its strength by ineffectual struggles, when it soon despatches its victim.



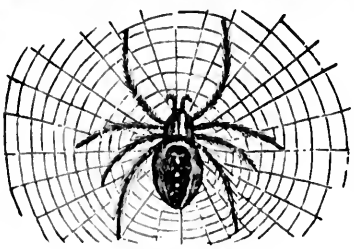
Mygale Fodiens.

The Mining Spi-

* These are not the animals known in the south of Europe under the name of Tarentula, receiving their designation from the city of Tarentum; the latter are true Spiders.

ders, found in the South of Europe, construct, in dry shelving situations exposed to the sun, subterranean cylindrical galleries, often two feet deep, and so tortuous, that the traces of them are lost. These they line with a silken tube, forming at its entrance a movable lid, composed of silk and earth, attached to the silken lining by a sort of hinge; and this is adapted, by its size, situation, and weight, to close the opening so precisely, as scarcely to allow its entrance to be distinguished from the neighbouring soil. When the spider enters its retreat, or passes out of it, the door shuts of itself. The Mygale spins a sort of cocoon round its eggs, enclosing a hundred or more; they are hatched within it, and the young undergo their first changes before quitting it.

The *Clotho* is remarkable for the curious habitation which it constructs for its young. It spins a kind of circular cocoon or tent, which it attaches to the under side of stones or to crevices in rocks by seven or eight points, leaving festoons between these, the edges of which are free. At first this consists of only two folds, but others are gradually added; and beneath them all a lining of peculiarly soft texture is constructed for the reception of the eggs. The young remain in this for some time after they are hatched, and are supplied by the parent with food. The *Argyroneta* forms a winter retreat for itself beneath the water. It spins an oval silken chamber, open at the bottom like a diving-bell, which it attaches by cords to water-plants. It then carries down successive bubbles of air beneath its body, by crawling down their stems; and these bubbles it transfers to its bell until it has filled it. It then takes up its abode in this cell, where it remains for the winter, first closing the mouth of the bell. The *Epeiræ* are among the most remarkable for the strength of their webs; some of the exotic species, which are remarkable for the variety of their forms, colours, and habits, spinning nets which are



Epeira Diadema.

sufficiently strong to catch small birds, and even to annoy man when he happens to come in the way of many together.

CLASS VIII.—CRUSTACEA.

The animals composing this group may be regarded as representing in the sea the insects and spiders of the land. Indeed, they were associated with those classes by Linnæus, in his class of Insects. But they are separated from both by very important characters. Their chief distinction is in the breathing apparatus, which is adapted to aquatic and not to aërial respiration. Instead of the system of branching tubes which we find in Insects, or the lung-like cavities which are a more concentrated form of the same structure in the Arachnida, the Crustacea are furnished with fringes of gills like those of the Mollusca or Fishes, into which the blood is sent, as it were, out of the body, to meet the small quantity of air contained in the surrounding water. In the highest order of this class, the gills do not hang loosely from the body, but are enclosed in a cavity, having two orifices, through one of which a constant stream of water is introduced, which is ejected through the other by a curious mechanical contrivance. And in a few species of this order, there is a special provision for keeping the gills moist when the animal leaves the water out of which it can live for a considerable period. The best known of these are the Land-Crabs of the West Indian Islands.

It is not only by their aquatic respiration, however, that the Crustacea are distinguished, but also by the calcareous nature of their integument. The shell, as it is commonly termed, is a secretion from the surface of the true skin, just as are the shells of Mollusca from their mantle. There is this important difference, however, between the two, that, while the latter is merely adapted to enclose loosely and to protect the general mass of the body, so that the locomotive appendages, when put in action, must be made to project beyond it, these being themselves unsupported by any hard skeleton, the former accurately fits not only the trunk but the extremities also, and, as in the other Articulata, is composed of a number of rings, more or less regular in form, and accurately jointed together by an intervening membrane.

As no addition to the edges of these rings would increase their diameter, some other means must be provided for enabling the size of the shell to keep pace with the increasing bulk of the body. This is effected by the periodical *exuviation*, or throwing off of the old shell, and the formation of a new one. This change is preceded by evident illness on the part of the animal, which retires to its hiding-place at the time. The part of the shell enclosing the trunk splits usually at its under part, in such a manner as to allow the body to escape; but the shell of the legs and claws remains entire, though the fleshy parts are entirely withdrawn from their interior. This is the more remarkable, as the bulk of the claw is much greater than the diameter of the joint through which it is thus made to pass: and often the disproportion is extreme. When the shell has been thus thrown off, the animal is entirely unprotected, and it carefully conceals itself from its enemies. Its soft skin is soon covered, however, with a sort of mucous exudation, which contains a large quantity of calcareous matter, and speedily hardens. The re-formation of the shell is facilitated by a store of carbonate of lime previously laid up in the stomach, where it forms the concretions commonly known as *crab's-eyes*; these disappear at this period, being absorbed, and then excreted on the surface of the skin.

The power possessed by the Crustacea of repairing injuries, is very remarkable in beings of such high organization. In the process of exuviation, it is not uncommon for a part of a claw to be lost; and this is speedily replaced by a new one. The second joint from the body is that at which the fracture most commonly occurs; and it is probably the only one from which the new growth can issue. For, if the claw be broken off below that point, the animal itself effects the removal of the upper portion, either simply casting it off by violent muscular contraction, or striking it against some hard body. The same is the case when the claw has been accidentally lost in some other way; and, accordingly, it is by no means uncommon to witness a great disproportion in the size of the two members, one being much smaller than natural, from its having been only recently produced.

The number of legs possessed by the Crustacea is greater than that of perfect insects, being never less than four pairs, besides the pair of claws which may be considered as metamorphosed legs. It is in the crab, lobster, crayfish, &c., that we find this small number; and these belong to the highest order, the Decapoda, or ten-footed Crustacea. In front of these are some curious organs termed feet-jaws, being intermediate in structure between

these two kinds of appendages; in some of the lower Crustacea these become true legs. And from the posterior part of the body there hang down certain appendages, which are also true legs in the lower orders. In fact, the lowest Crustacea approach very closely to the Myriapoda in their general form and structure, differing chiefly in their aquatic mode of life; the segments of the body are nearly equal, and are each furnished with a pair of legs. On the other hand, among the Decapoda we find an approximation to the form both of insects and spiders—the lobster representing the one, and the crab the other. In the lobster we have a regular division into *head*, *thorax*, and *abdomen*, as in insects; and it is to the thorax alone that the locomotive appendages are attached, as in the perfect state of the insect. There is no rudiment, however, of wings. As in the insect, we find that, where the force is concentrated in one part of the body, and the general movement is effected chiefly by the members, the segments of that part are consolidated; and, accordingly, the thorax of the lobster seems, until carefully examined, as if composed of a single piece. The segments of the abdomen, however, are movable on each other; and their motions assist in progression, the flattened tail serving as a fin by which the water is struck. In the crab, the head, thorax, and abdomen, are all consolidated into one mass; but the division into segments is still evident on the under side.

As in all other Articulata, the eyes of the Crustacea are compound. Their external coating is thrown off with the shell; and this, when examined with the microscope, is seen to exhibit the division into minute lenses with beautiful distinctness. By its transparency the cast shell may be at once distinguished from one in which the animal has died. It is interesting to find this structure preserved in great perfection in a curious fossil tribe of this class, the *Trilobites*, the compound structure of whose eyes, mounted as they are upon short foot-stalks, is at once distinguishable with a magnifying glass, proving them to have been articulated animals, even if no other evidence existed to that effect.

Owing to the great varieties of structure which this class includes, its division into orders appears very complex. Thirteen are established by M. Milne-Edwards, the characters of which will now be generally stated. As many of them, however, contain but a few species, of which little is known, a more detailed account will be given of those only which possess more universal interest.

The class Crustacea may be separated in the first instance into two divisions. In one of these, including the great bulk of the class, the mouth is furnished with organs specially destined for the prehension or division of the food. In the other, there are no special organs for the purpose, the bases of the neighbouring legs serving the purpose of jaws. This *second* division contains but one order, the Xyphosura, and this contains but one genus, the *Limulus*, or King-Crab, which will hereafter be noticed in detail. The *first* division is then separated into two groups—one, the Maxillosa, having the mouth furnished with jaws; the other, the Edentata, having the mouth prolonged in the shape of a sucker. These two groups are precisely analogous to those of Mandibulata and Haustellata among insects. The Edentata are divided into three orders, according to the form of the extremities:

Araneiformes, in which the extremities are rod-like, long, and adapted for walking.

Stphonostomata, in which the extremities are not adapted for walking, are partly formed into plates, and partly adapted for prehension.

Lernéiformes, in which the extremities are but little developed, and the body presents great variety of form. Most of these are parasitic upon other animals, especially fishes, to which they cling by means of hooks in which their rudimentary extremities terminate.

The Maxillosa, containing by far the larger proportion, as well as the most highly organized forms of the class, are again distributed into four sections. 1. Podophthalmia, in which the eyes are mounted upon foot-stalks, and are movable. These have almost always branchiæ, properly so called; their feet are partly ambulatory, partly prehensile; and the thorax is covered with a *carapace* or shield (like the upper shell of the turtles), which is formed by the great development of one of the rings, overlapping the rest. 2. Edriophthalmia, in which the eyes are *sessile*, or not mounted on a pedicle. The branchiæ are not separate organs, being united with the extremities; these are almost always seven on each side, and adapted for walking. There is no carapace. 3. Branchiopoda, in which there are no gills, but the anterior pairs of legs are flattened into plates, which are subservient to respiration. 4. Entomostraca, in which there are no branchiæ, or any apparent organs to supply their place. The eyes are sessile, and commonly united into a single mass. These groups are again subdivided into nine orders, as follows:—

1. The Podophthalmia consist of the Decapoda, in which there are five pairs of thoracic extremities, and which have the gills enclosed in a special respiratory cavity; and the Stomapoda, which have six or eight pairs of thoracic extremities and external branchiæ.

2. The Edriopthalmia contain three orders—the Amphipoda, in which the thoracic members are subservient to respiration, and the abdomen well developed, and furnished with six pairs of limbs; the Læmodipoda, in which the abdomen is not developed; and the Isopoda, in which the abdomen is well developed, and its members, which are similar in form to the rest, subservient to respiration. It is this order which most resembles the Myriapoda.

3. The Branchiopoda contain two orders—of which one, the Cladocera, has a carapace in the form of a bivalve shell, with five pairs of thoracic members; whilst in the other, the Phyllopoda, there is no carapace, and the extremities, which are formed for swimming, are more numerous, varying from eight to twenty-two.

4. The Entomostraca are also divided into two orders; the Copepoda, which have the body divided into distinct rings, but without carapace, and the appendages to the mouth in considerable numbers; and the Ostrapoda, in which the body is without annular divisions, and entirely enclosed under a large shield having the form of a bivalve shell, the extremities being in very small number. In some members of this division, we find a very close approximation to the higher Rotifera.

Order I.—Decapoda.

It is in this order that we find the highest general organization, the largest size, and the most varied habits; it is the one most useful to man, and most interesting to the naturalist. The lobsters, crabs, cray-fish, prawns, shrimps—in fact, nearly all the species that are ever used as food—belong to it. Their growth is slow, but they ordinarily live a long time. Their habits are mostly aquatic; but none of them are killed at once by being withdrawn from the water; and some of them pass the greatest part of their lives in air. They are naturally voracious and carnivorous; the first pair of legs is usually transformed into a pair of powerful claws, by which they seize their food, and convey it to the mouth. This order contains three families; the Brachyoura, or short-tailed Decapods, to which the name of *Crabs* is commonly given; the Macroura, or long-tailed, such as the Lobster, Cray-fish, &c.; and the Anomoura, in which the abdomen is prolonged, but destitute of a shell, so that the tail is soft, and which inhabit the shells of Mollusca, in which they seek protection.

As illustrations of the structure and habits of the Brachyoura, the common *Crabs* will suffice; but a pe-

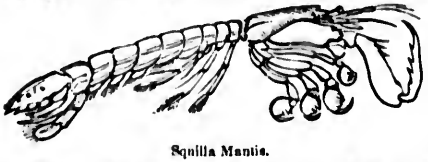
cular tribe, that of the *Land-Crabs*, should be specially mentioned. These often live at a considerable distance from the sea, and even burrow under ground. Their gills are kept moist by a kind of spongy structure in the interior of the cavity which encloses them, and from this a sufficient amount of fluid is secreted, to prevent them from being dried up. Some species, though living on land, are confined to damp situations. Others, however, ordinarily inhabit elevated regions, and migrate towards the sea once a year to deposit their spawn.

The Macrodra are distinguished, not only by the length of their tail, but by having it expanded at the extremity into a pair of fin-like processes, which afford valuable assistance in swimming. This family is a very extensive one, and contains the largest species of the whole class.

The Decapods of the family Anomoura are commonly known by the name of Hermit-Crabs, from their remarkable habit of seeking protection in the empty shells of molluscs. The shells they seem to prefer for this purpose are those belonging to the family Trochoidæ. The abdomen or tail is inserted into the upper part of the cavity, of which, after a time, it assumes the perfect form, so that when withdrawn it presents all the markings of it. The thorax and head occupy the lower part of the spire; and the mouth is closed by one of the claws, which is usually larger than the other, and serves as an operculum when the animal is withdrawn. When they outgrow the habitations they have selected, they quit them and go in search of others; and they try one shell after another, by slipping the tail into it, until they have found one whose size and form suit them.

Order II.—Stomapoda.

This is a much less extensive order; and the species it contains are entirely marine, and mostly confined to tropical climates; on which account comparatively little is known of them. Some of them have powerful claws,



Squilla Mantis.

which they use for seizing their prey in the same manner as the Orthoptera among insects; so that these have received the name of Sea Mantes. The accompanying figure shows one of the most characteristic forms of the order, which is abundant in the Mediterranean. The gills are there seen to be affixed, in separate tufts, to the abdominal appendages.

Order III.—Amphipoda.

This is an extensive order, in regard both to the number of species contained in it, and the amount of individuals which are sometimes seen collected together. The greater number of them are marine, but some are found in brooks and reservoirs; all, however, are more or less aquatic in their habits. They are of small size, and swim and leap with agility. The best known British species is the *Sand-hopper*, which burrows in the sand, and which, unlike the greater part of the order, seldom enters the water.

Order IV.—Læmodipoda.

Of this small order, one of the most interesting and characteristic species is the *Cyamus*, commonly called the Whale-Louse, from its infesting the Cetacea as a parasite. Sometimes these creatures are so abundant on the surface of whales, that the individuals they infest may be recognised at a distance by the white colour these parasites impart to them.

Cyamus Balænarum.

Order V.—Isopoda.

These Crustacea not only resemble Myriapoda in external form, but in many parts of their internal structure. The greater number live in water, but many species, such as the common Wood-Louse, are inhabitants of the land. Having no special apparatus, however, for keeping the respiratory surface moist, they can only exist in damp places. The *Oniscus*, or Wood-Louse, frequents dark and concealed places, such as cellars, caves, chinks in walls, or hollows under stones. It feeds upon decaying vegetable and animal matter, and only comes forth from its retreat in damp weather. It has the power of rolling itself completely into a ball.

Order VI.—Cladocera.

The Crustacea composing this and the three following orders are of very small size, so that the details of their structure can only be examined with the microscope. They mostly inhabit fresh waters, and are in almost constant motion. A characteristic example of this order is the common *Daphnia Pulex*, or Water-Flea, which may be found during the summer in almost every pond, and is recognised by its very rapid and sudden movements, resembling the leaps of the animal after which it is named. These are principally executed by a pair of large branched antennæ, which serve as oars.

Order VII.—Phyllopoda.

To this order, which is characterized by the prolonged form of the body, and the flattening of the extremities, which adapts them for swimming, belongs a large number of species, whose movements are generally very regular and equable. The *Branchipus*, one of the most characteristic examples, is found, often in great numbers, in small puddles, and most abundantly after heavy rain.

Branchipus Stagnalis.

The eggs are capable of being dried up without injury, and are hatched soon after being moistened

Order VIII.—Copepoda.

The animals of this and the next order are commonly termed *monoculous*, from the two eyes being united into one mass. In their general habits they agree with the former. The *Cyclops* is an interesting species, very common in the ponds and ditches of this country. The female has an oval sac on each side of the tail, in which the eggs are carried. She is able to produce ten broods in the course of three months, and as these are speedily able to reproduce themselves, it has been calculated that in a year, 4,442,189,120 young may be the progeny of one individual. The majority of the animals of this order swim with the back downwards, darting about with great agility, and moving backwards or forwards with equal ease. In the absence of animal matter, on which they usually feed, they attack vegetable substances.

Cyclops Vulgaris, magnified.

Order IX.—Ostrapoda.

In habit and general character, the animals of this order, of which the common *Cypris* of our ponds is an example, closely resemble those of the last, but their bodies are enveloped in a sort of bivalve shell. They swim, like the *Daphnia*, by means of the prolonged antennæ, which spread at their extremities into tufts of filaments.

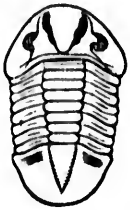
The animals of the division Entomata are nearly all parasitic. In their general organization they are the most imperfect of all Crustacea, some of them approaching the higher Entozoa whilst others have a resemblance

to the lowest Arachnida. The various species of these orders, which need not be more minutely particularized, infest, more or less, almost all marine animals.

There now only remains the remarkable order *Xyphosura*, separated from all the rest by the absence of any special organs for conveying food into the mouth. It receives its name from the sword-like prolongation of the carapace, which is used as a weapon by the natives of the regions in which the animals exist. The *Limuli*, or King-Crabs, as they are commonly termed, are peculiar to the East Indies (abounding in the neighbourhood of the Molluccas) and the coast of America. They sometimes attain the length of two feet. Their legs are very short, not extending beyond the margin of the shell. The anterior ones seem to assist in conveying food to the mouth; and the posterior are modified for respiration.

Limulus Polyphemus.

Near the *Limuli* should probably be placed the remarkable group of *Trilobites*, which are at present only known in a fossil state, but which were very abundant in former epochs of the earth's history. There can be no doubt, from the character of the animals with whose remains it is found, that the Trilobite was an inhabitant of the water; and as its integument was evidently hard and articulated, it must have been a Crustaceous animal.



Asaphus Expansus.

Same rolled up.

CLASS IX.—MYRIAPODA.

The class Myriapoda is the lowest in which we meet with articulated members, or distinct jointed legs, as well as with an articulated body. These are intermediate in their conformation between the more highly organized legs of insects and the simple bristle-like appendages possessed by some of the Annelida; and this is exactly the place to which we should refer the animals of this class, from a regard to their general structure. For, on looking at the form of their bodies, we observe that they are distinguished by an uniformity in the character of the segments, nearly as great as that which prevails in the Annelida; so that an *Iulus* might almost be likened to an earthworm provided with a stiffened integument, and with slender legs: whilst, on the other hand, the adaptation of the respiratory organs to breathe air with regularity and energy, the increasing complexity of the apparatus of mastication, the possession of distinct eyes, and many other characters, indicate their affinity with Insects—in which class, indeed, some naturalists comprehend them.

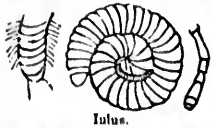
Cyclops Vulgaris, magnified.

Most persons are familiar with the common forms of this class—the *Centipedes* (hundred legs) and the *Millepedes* (thousand legs); and a minute description of them is therefore unnecessary. On examining any of these animals, the following points will be observed. The covering of the body is firm, and of a somewhat horny character, resembling that of many insects. The division into segments is very distinct; a flexible membrane being interposed between each pair of firm rings or plates. This is obviously required by the condensation of the skin; since, if it were otherwise, the body would not have the power of bending in any direction. The legs are covered by the same kind of integument, and are jointed in a similar manner; each terminates in a single claw or hook. No division of the body into distinct regions, like those which are so evident in the true Insects, can be observed; but, on the contrary, the segments are nearly equal along its whole length, and each is provided with one or two pairs of legs. The first segment, or head, is furnished with eyes formed upon the same general plan as those of insects; and also with a pair of long jointed antennæ, which are probably organs of touch. On the side or under surface of the animal may be seen a row of minute pores, a pair usually existing on each segment, which are the apertures for the admission of air to the respiratory organs. The different parts of the nervous system are repeated in a similar manner, a pair of ganglia being found in every division of the body.

The Myriapoda may be divided into two orders, the Iulidæ, or *Millepedes*, and the Scolopandridæ, or *Centipedes*.

Order I.—Iulidæ.

The Iulidæ, consisting of animals bearing a general resemblance to the *Iulus*, or common Millepede, are the most nearly allied to the Annelida, both in external form and in the arrangement of the several organs. The *Iulus Terrestris*, or Galleyworm, is a species often found concealed under stones, or beneath the bark of decaying timber. Its body is long and cylindrical, and is composed of between forty and fifty hard rings, which, except at the head and tail, differ but little from one another. Each segment gives origin to two pairs of small legs, which arise close to the middle line along the under surface of the body. These are scarcely large or strong enough to support its weight, so that the animal moves but slowly, and seems rather to glide or crawl than to walk. When at rest, the body is rolled up in a spiral form, and the feet, being concealed in the concavity of the spire, are protected from injury, whilst the firmness of the rings of the body enables them to resist considerable pressure.



Iulus.

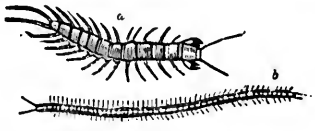
The mouth of the *Iulidæ* is furnished with a pair of stout horny jaws, moving horizontally, and furnished with sharp toothed edges; and by means of these, they are enabled to divide with facility the portions of decayed vegetable matter upon which they usually feed. These animals are very harmless to man, not being possessed of any poisonous organs; and they may be regarded as positively benefiting him, by the removal of substances the decay of which would be noxious. The common *Iulus* of this country seldom much exceeds an inch in length, but there is a South American species (*I. maximus*) which attains the length of seven inches.

Order II.—Scolopendridæ.

The animals composing the order Scolopendridæ may be distinguished from the Iulidæ by the greater development of the legs, by the diminution in their number and in that of the segments, and by the flattened form of the body.

Of the carnivorous propensities of the Scolopendridæ the structure of the mouth affords sufficient evidence. It is provided not only with a pair of horny jaws resembling those of insects, but with a pair of strong sharp

claws, formed by an enlargement of the second pair of legs, which are perforated at the tip with a minute aperture through which a venomous fluid is probably instilled into the wounds made by them. Small insects seized in these claws are seen to die very speedily, and in warm countries the bite of a large species of Centipede is a source of great irritation to man, being reputed more injurious than that of the Scorpion, though it is seldom fatal. The application of ammonia is the most effectual remedy for the pain, as well as for the constitutional effects of the bite. The last pair of legs undergoes some modification in this order; being directed backwards, so as to form a kind of double tail; and not being used for walking except when the animal is moving backwards.



a, Lithobius Forcipatus; *b*, Geophilus Longicornis.

The European species of this order seldom exceed two or three inches in length, but they present themselves by no means unfrequently. Like the Iulidæ, they frequent dark places, hiding themselves under stones, the bark of trees, in the ground, and especially in over-ripe fruit which is likely to attract insects. In tropical climates, however, they attain a much larger size, and abound still more. Centipedes of the length of fifteen inches have been brought to this country; and it is stated by Ulloa, that at Carthagena they have been seen exceeding a yard in length and five inches in breadth; and that the bite of these is mortal. It is doubtful, however, whether this statement may be relied on.

CLASS X.—ANNELIDA.

The class of Annelida is the lowest in which the articulated structure is distinctly manifest. It is composed of animals having a worm-like body, without true jointed legs; and marked by transverse lines that divide it into a succession of rings or segments, which, except the first and last, differ little from each other but in size. Many of them are remarkable for the red colour of their blood; and, on account of this character, they have been regarded as approaching nearer to the vertebrated subkingdom than any other class of articulated animals. This is not universally observed, however, for in some species the blood has a greenish tint, and in others it is nearly colourless, as in invertebrata in general. The body is usually soft and flexible, the rings being possessed of little firmness, and no internal skeleton of any description being present. It is not only flexible, but capable of great alteration in its dimensions, as may be seen in the common earth-worm or leech.

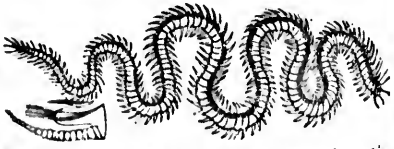
The greater part of this class are solely inhabitants of the water, and are provided with external appendages for exposing the blood to its influence, which are analogous in function to the gills of fishes, but which are often distributed over the whole surface, and are also concerned in locomotion. It may be regarded as the *regular* form of these animals to possess such appendages upon every segment. But not unfrequently the body is enclosed in a tube, and then the gill-tufts are collected in the neighbourhood of the head, where they may be protruded from its opening. The earth-worm and a few other species are adapted to live on land, and they have a series of air-sacs arranged along the interior of the body on each side, opening externally by a small orifice, of which a pair may be seen upon each segment.

The first segment, which may be termed the head, contains the mouth, sometimes provided with a formidable apparatus of jaws; and it is also generally furnished with eyes, and with variously shaped tentacula, which are apparently instruments of touch. The last segment is occasionally destitute of the appendages with which the rest are provided, and these are replaced by a sucker, which is of great assistance in locomotion.

The class is subdivided into orders by the differences in general conformation and habits exhibited by the tribes which compose it; and especially by the character and distribution of the respiratory organs. The first order, Dorsibranchiata, includes those which have the branchial appendages or gill-tufts disposed regularly along the body, sometimes extending its entire length and sometimes restricted to the segments about the middle. This order has been also denominated *Errantia*, from the active habits of the animals comprehended in it. In the next, Tubicola, we find worm-like animals inhabiting fixed and permanent residences like the Mollusca. Sometimes they are enclosed in shelly tubes, formed by an exudation from their own surface, and sometimes in casings constructed by the agglutination of foreign substances. The disposition of the gill-tufts around the head is the principal character which distinguishes the animals themselves from those of the first order. In the third order, Terricola, the body is destitute of all external appendages, except some minute and almost imperceptible bristles; for the respiratory organs are here developed internally, the animals being formed to crawl upon the ground instead of swimming through the water. And in the last, Suctoria, the body is destitute even of these bristles, but is furnished with a sucker at each end of the body. The two latter groups were regarded by Cuvier as forming one order.

Order I.—Dorsibranchiata.

Of the foregoing orders, the Dorsibranchiata appear, on the whole, to possess the most complex structure, as well as the most varied faculties, and they also exhibit the most characteristic forms of the class. The head is almost always distinct from the body, and furnished with highly-developed organs of sensation, as well as with complex instruments of mastication. These marine worms do not attain any considerable dimension upon our own coasts, rarely exceeding a few inches in length; but in tropical climates some species are found of comparatively gigantic proportions, having their bodies composed of 400 or 500 segments, and occasionally measuring four feet from one end to the other. Their general form will be seen in the accompanying figure, which represents the *Syllis Monilaris*; and the enlarged view of one of the lateral appendages will show the parts of which it consists. In the centre there is a tuft of delicate bristles, which may be regarded as the chief organ



Syllis Monilaris, with an enlarged representation of one of its appendages.

of respiration, the blood being sent into them to be exposed to the air contained in the water; above and below there are separate bristles, much more elongated, of which the lower one has a jointed character, these are instruments of locomotion, and may be regarded as rudimentary legs. The arrangement of these

parts differ much, however, in the various tribes of this order.

Among the more interesting forms of this order may be mentioned the family NEREIDÆ, or Sea-Centipedes, of which many species inhabit our own coasts, but much larger ones are found in tropical seas. They have no venomous power, but are extremely voracious; and are often furnished with a complex apparatus for seizing their prey and reducing it to fragments.

The *Aphrodita* is an animal well known on our coasts under the name of *Sea-Mouse;* numbers are often cast up by a gale of wind. The body is flattened, and shorter and broader than that of other Annelida. The back is covered by two longitudinal ranges of broad membranous scales, under which the gills lie concealed. The most common species of Sea-Mouse are about six or eight inches long, and two or three broad. A great part of the body is covered by bristles of brilliant lustre, and of colours which vary with the light; so that the animal is scarcely surpassed in beauty of colouring by any other. The *Arenicola piscatorum*, known to fishermen by the name of *Lob-worm*, is another species common on our coasts, and is eagerly sought as a bait. It burrows, like the earth-worm, in the sand; and the place of its excavations may be known by the little heaps which it casts up. The branchial tufts are confined to the centre of the body, where they form on each side a series of bunches, which are remarkable, during the life of the creature, for their beautiful red colour, derived from the crimson blood which circulates copiously through them.

Order II.—Tubicolæ.

Comparatively little is known of the structure of the animals of the order Tubicolæ, which never attain to such great dimensions, and do not offer to the naturalist the same facilities for examination. The structure of the casings which they form, however, has been fully investigated. One of the commonest of these is the shelly tube exuded by the *Serpula*. This is formed of calcareous matter resembling that of the shells of Mollusca, and apparently secreted from the surface of the body in a similar manner. These tubes, which are often very greatly contorted in form, are generally found encrusting the surface of stones or other bodies which have been immersed for any length of time at the bottom of the sea; they are closed at one end, which tapers to a point, and the wide end is open.

Serpula Contortuplicata, taken out of its tube.

The animal forming this shell has its branchial filaments all assembled round the head, where they form a pair of most elegant fan-like appendages, which usually possess very brilliant colours. At the base of each tuft is a fleshy filament; and one of these, on the right or left side indifferently, is always prolonged and dilated at its extremity into a flat disk, which fits to the mouth of the shell, and serves to close it when the animal is withdrawn into the tube.

The *Sabella* is an animal very much resembling the Serpula; but it constructs its tube by agglutinating particles of clay or fine sand. The *Terebella* forms a similar tube, by cementing together minute shells and fragments of larger ones, together with particles of sand, gravel, &c.; and some species live in aggregate groups, so that the clustering together of their tubes forms solid masses, which may go on increasing to a considerable size. In none of these cases is the shell or tube to be regarded as part of the animal; it is merely its habitation. The Annelide forms no muscular attachment to it, and its body can be easily drawn forth from its interior.

Order III.—Terricola.

The order Terricola includes very few genera, of which the *Lumbricus*, or common *Earth-worm*, is the chief. They live in general beneath the surface of the ground, either perforating the dry soil, or burying themselves in mud, where many of them lead a semi-aquatic life. When the Earth-worm is boring, it insinuates its pointed head between the particles of earth, among which it penetrates like a wedge; and in this position, the anterior part of the body is fixed by spines or bristles curved backwards, which prevent it from slipping. The hinder parts are then drawn forwards by a longitudinal contraction of the whole animal—a movement which the spines do not oppose. This swells out the anterior segments, and forcibly dilates the passage into which the head had been already thrust. The spines upon the hinder rings then take a firm hold upon the side of the hole thus formed, and prevent any backward movement; the head is again forced forward; and, by a repetition of the process, the animal easily makes its way through substances which it would at first have seemed impossible for it to penetrate.

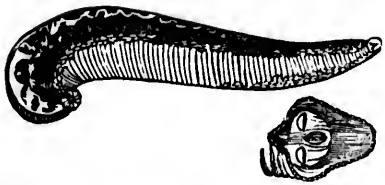
The burrowing of Earth-worms is a process exceedingly useful to the gardener and the agriculturist; and these animals are far more beneficial to man in this way than injurious by devouring the vegetables set in the soil. They give a kind of under-tillage to the land, performing the same below ground that the spade does above for the garden, and the plough for arable land, and loosening the earth so as to render it permeable to air and water. It has lately been shown that they will even add to the depth of the soil, and create mould where none existed before. This they do principally by the exercise of their digestive process. They take a large quantity of the soil through which they burrow into their intestinal canal; from this they extract the greater part of the decaying vegetable matter it may contain, and reject the rest in a finely divided state, forming what are known as worm-casts. By the accumulation of these, a field which was manured with marl has been covered in the course of eighty years with a bed of earth averaging thirteen inches in thickness.

It is commonly supposed that the Earth-worm may be multiplied by the division of its body into two pieces, of which each will continue to live. This does not appear to be the case. If it be divided across the middle when in motion, each will continue to move for a time but only the piece which bears the head will be found alive after a few hours. This forms a new tail, and soon shows little sign of the injury. But if the division be made near the head, the body will remain alive, and will renew the head; and the head with its few attached segments will die. The *Naides*, however, have a much greater amount of reproductive power; for they may be cut into many pieces, of which each will become a perfect animal; and it is stated that a separation takes place spontaneously, but to a much greater extent.

Order IV.—Suctoria.

The order Suctoria contains the common Leech and its allies, which are all animals of aquatic habits, but not all agreeing in its blood-seeking propensities. Most of the tribe, however, live at the expense of some other animal.

The structure of the mouth of the leech is very interesting. It is situated in the middle of the cavity of the anterior sucker; and three little cartilaginous bodies, usually called *teeth*, but more properly *jaws*, are seen to be disposed around it, in such a manner that the three edges form three radii of a circle. Each of these has two rows of very minute teeth at its edge; so that it resembles a small semicircular saw. It is imbedded at its base in a bed of muscle, by the action of which it is



Leech, with the anterior sucker and teeth enlarged.

worked in such a manner as to cut into the skin—a sawing movement being given to each piece separately. It is in this manner that the tri-radiate form of the leech-bite is occasioned; each ray being produced by a separate little saw. The lacerated character of the wound is very favourable to the flow of blood, which is further promoted by the vacuum created by the sucker. The greater number of the *Leech* tribe are inhabitants of fresh water; some, however, are only found in the sea; and there is one terrestrial species, a native of Ceylon, which appears to be more voracious than any other, and to be one of the greatest pests of that fine island.

CLASS XI.—CIRRHOPODA.

The animals composing this class have so many characters in common with the Mollusca, that they have been generally regarded as belonging to that sub-kingdom. The body and its appendages are themselves quite soft; and the skin has the loose spongy muscular character which corresponds with the *mantle* of Molluscs. From its surface is secreted a shell, composed of several pieces, but not differing in general aspect from multivalve shells belonging to that division. Further, the shells are either themselves firmly united at their base to some solid masses, or they are attached by a foot-stalk; so that the conditions in which the animals exist closely resemble those to which we observe the Mollusca peculiarly adapted.

On the other hand, when we examine the animal itself, we find that it is perfectly symmetrical in its form—a character nowhere existing among the Mollusca which are enclosed in shells. Its body is prolonged and exhibits a tendency to division into segments; and from each of these there arises a pair of appendages on each side, which possess something of a jointed structure. These *cirri*, as they are termed, are long tapering arms, fringed with cilia, or little hair-like filaments; and they have gills at their base. Further, the mouth is furnished with lateral jaws, which no Mollusca possess; and the nervous system consists of a double cord, with a pair of ganglia in each segment of the body, precisely as in the other Articulata. The most interesting proof, however, that the Cirrhopoda belong to this division, is derived from the history of their development. On their liberation from the egg, they present a form much more analogous to that of the lower Crustacea than to that of the adult animal, which they only acquire after a series of metamorphoses. They are furnished with antennæ and eyes, and move freely through the water; but when they become fixed they lose also these organs of sense. The shell is not formed of simple layers, like that of the Mollusca, but is traversed by a complex series of canals, through which nourishment is conveyed to it.

The Cirrhopoda are divided into two principal groups —the *pedunculated* and the *sessile*. The latter, of which the common *Balanus* or *Acorn-shell* is an example, have the base of the shell fixed immediately to rocks. In the former, such as the well-known *Barnacle*, the shell is attached by a peduncle or footstalk, which consists of a tube of leathery consistence, and is often of considerable length. In both groups, the animals, not being able to go in search of food, obtain it through the currents produced by the action of their cilia.

The shell of the common *Barnacle* consists of five pieces, of which two are large valves, somewhat resembling those of a mussel; two smaller pieces are jointed to these near the point; and one unites the valves along the back edge. These cover the whole of the mantle. Barnacles are abundant in all seas, and fix themselves, in preference, to wood; so that a piece of timber which has been for a short time floating in the ocean is almost sure to be partly covered with them; and ships' bottoms, if not protected by copper, are rendered so foul as greatly to impede their sailing.

Group of Anatifa, attached to a ship's bottom.

The *Balanus*, or Acorn-shell, has more of a globular shape, with a narrow mouth, and is composed of a certain number (varying in the different species) of plates of a triangular form, so disposed, that an addition to the edges of each shall preserve the general proportions of the shell, while increasing its cavity in all its dimensions in accordance with the growth of the animal. In this arrangement we recognise the same plan as that adopted in the shell of the echinus. The animal closely resembles the barnacle. The mouth of the shell is guarded by an *operculum*, consisting of two or more valves, which close it more or less completely. The rocks, piers, &c., on many parts of the coast, are covered with these animals; and small species of them also attach themselves to shells of various kinds.

CLASS XII.—ROTIFERA.

The class Rotifera is one composed entirely of animalcules which can only be distinctly seen with the microscope; and it takes its name from the wheel-like organs with which most of them are provided, whence they are commonly known as Wheel-Animalcules. It is only within a very recent period that the complex structure of these beings has been understood, and that they have been separated from the animalcules of simpler organization. It is on account of the prolonged form of their bodies, the position of the mouth and eyes at one extremity, the occasional marking of transverse lines indicating a division into segments, and most of all by the character of the nervous system, when that can be detected, that the Rotifera are ranked in the articulated sub-kingdom. Unquestionably, they bear more general analogy to that than to any other; but they must not be considered as characteristic specimens of it.

The structure of the common wheel-animalcule, *Rota*

fer vulgaris—which may be found in many collections of stagnant water, especially such as have been long and freely exposed to the atmosphere—will afford a good illustration of that of the class. The body exhibits a prolonged form when fully extended; but, as the integument is very elastic, it may be drawn up into a circle or made to assume a great variety of shapes. At one end it is furnished with a pair of projections, which are surmounted by circular fringes of cilia. It is by the vibration of these cilia that the currents are produced in the water around, which give an appearance as of the continual revolution of wheels. Between the wheels a sort of head extends forwards, on which a couple of red spots may be observed, which are believed to be eyes. The mouth is situated at the base of this central projection. At the opposite end the body is prolonged into a sort of tail, furnished with three prongs; and by this the animal fixes itself when working its wheels for obtaining food.

The delicate membrane which covers the body has two series of muscular fibres disposed within it; one set running longitudinally from end to end; the other transversely, so as to form rings around the body. By the contraction of the former the body is shortened; by that of the latter its diameter is decreased, and it is consequently lengthened. This is the same kind of apparatus as that by which the form of the leech and worm tribe is altered. The transparency of the integument allows the contained organs to be distinctly seen; and these are perceived to have regular membranous walls of their own, and to be altogether distinct from the general substance of the body. The most curious of these is the gizzard, or set of jaws (as it may perhaps be termed) in which the food is ground down before it is transmitted to the true stomach. This is placed in the fore part of the body, and principally consists of a hard framework in two pieces, each of which bears two teeth. The two frames are moved by powerful muscles, and worked in such a manner that the teeth are made to interlock and to separate alternately, so as to tear all the food which is transmitted into the stomach. From the stomach there passes backwards a long straight intestine, which terminates near the posterior part of the body.

These animalcules feed chiefly upon others of smaller size and simpler character. The currents set in motion by the cilia are very powerful, and draw in whatever small bodies are within their scope; and the animal seems to select from these what is adapted to afford it nutrition. Sometimes it folds in its wheels, and moves along a solid surface by the suckers with which its head and tail are furnished, in the same manner as a leech; and sometimes it remains altogether inert for a considerable period. One of the most remarkable points in its history is its power of being revived by the application of moisture, after having been entirely dried up. This experiment, however, does not always succeed.

The Wheel-Animalcules are propagated by eggs, the development of which within the body of the parent may be very distinctly seen, on account of the transparency of the latter. These eggs are large and not very numerous, seldom more than four; but they rapidly arrive at maturity, and are soon capable of producing others. It has been calculated that, from a single individual, more than a million may be produced in ten days. In some of this class, the eggs are borne for some time on the outside of the body, attached to its posterior part, as in the *Cyclops* and other minute Crustacea, to which the general structure of the higher species of Rotifera shows them to be nearly allied. Other species connect this class with the higher Polypifera.

CLASS XIII.- ENTOZOA.

This class derives its name from the peculiar condition in which the animals composing it exist, most of them being inhabitants, during their whole lives, of the bodies of other animals, generally those of higher organization, from the juices of which they derive their nourishment. Many of them possess a distinct worm-like form, the body being much prolonged, and exhibiting a division into segments, and the mouth being situated at one extremity. These, therefore, evidently belong to the Articulated series. There are others which, in the absence of all distinct organs, and also in the circularity of their form, seem to approximate more to the Radiata. Some species, formerly located in this class, are now known to be low kinds of Crustacea.

A division of the Entozoa into two sections has been proposed, founded upon the general peculiarities of their structure, which it may be useful here to adopt. In the first and highest of these, there is a distinct intestinal tube, with an orifice at each end; and traces of a nervous and muscular system, more or less developed, may be detected. This division evidently approximates to the Annelida. It includes, among many other species, the *Filaria*, or Guinea-Worm, which burrows in the flesh of man and other animals in warm climates; if undisturbed, it will often continue its operations for a considerable time without much uneasiness; but, if disturbed, it sometimes occasions the most excruciating pain. When it shows itself externally, it is extracted very slowly, for fear of breaking it, in which case the remainder would retreat, and continue to exist; it grows to the length of several yards. The *Ascaris lumbricoides*, or Round Worm of the intestines, also belongs to this group. It infests not only man but many of the lower animals, and often occasions severe disease and even death. It derives its second or specific name from its resemblance to the earth-worm. The short active Thread-worms, sometimes infesting the lower part of the intestine, are another species of the same genus.

In the lower division of the class, there is no distinct alimentary canal; the cavities for the reception of food, as well as those for other purposes, being, as it were, channelled out of the soft, almost homogeneous, tissues of the body. Some of these still preserve the worm-like form. Such are the so-called eels in vinegar; and the curious little parasites which have been recently discovered to infest the muscles of man. To this group also belongs the *Tænia Solium*, or Tape-Worm, in which we find a remarkable repetition of organs. The body is distinctly divided into joints or segments, which sometimes amount to several hundred: the whole animal occasionally attaining the length of ten feet. These segments are all connected by the nutritive canal, which runs from one end to the other; but the reproductive apparatus is repeated in each division. The head is small and possesses four mouths, surrounded by a double circle of small hooks. Its existence is essential to the life of the body, the latter dying if it be broken off; but if some of the joints remain attached to the head, it continues to grow and form new ones. In this repetition of parts, we see a tendency towards the type of the Polypifera.

One of the most simple of all the Entozoa is the common *Hydatid*, or Acephalocyst (headless bag), which seems to consist of nothing but a globular membranous bag filled with a limpid colourless fluid. It exhibits no motion or indication of sensation, when stimuli of any kind are applied to it; and it is often difficult to distinguish it from the tissues in which it is found. Its power of reproduction, however, by the formation of *gemmæ*, or buds between its layers, shows it to be entitled to the rank of an independent being; the young Hydatids are thrown off internally or externally according to the species.

Among the animals associated with this group, though not conforming with it in their residence, is the *Planaria*, a very interesting genus, of which some species inhabit fresh water, and others are marine. The body is flat,

and three or four times as long as broad. Within its soft tissue are channelled out not only a complex digestive cavity, but also a system of vessels which absorb fluid from its walls and convey it through the system and a reproductive apparatus. The stomach opens, not by a mouth at one end, but by a sort of sucker projecting from the middle of the body; and through this the Planaria imbibes the juices of various aquatic animals which it attacks, mastering even active little worms by twisting its body round them. The most curious part of their economy consists in their power of reproducing parts that have been lost, and of repairing injuries, which seems almost as great as that of the Hydra among Polypes. They may be divided into three parts, of which the former shall contain the two minute spots which are believed to be eyes, the middle one the sucker, and the posterior one the reproductive apparatus; and in a short time each part will develop itself into a new individual, perfect in all its parts. It may be partially split longitudinally from either extremity, so that two heads or two tails will be formed, uniting at the middle point, but each being complete in itself.

SUB-KINGDOM—MOLLUSCA.

The range of animal forms comprehended in this division of the Animal Kingdom is so great that it would be difficult to include them by any definition applicable to them all. The highest class approaches Fishes in many points of its organization; while in the lowest we not only lose sight of some of the characteristic peculiarities of the group, but we find a near approximation to the higher Polypifera In all the Mollusca, the body itself is of soft consistence, as its name imports, and is enclosed in a soft elastic skin, lined with muscular fibres, which is termed the *mantle*. This skin, in many instances, is not applied closely to the body, but forms a membranous bag, having apertures (which are sometimes prolonged into tubes) for the entrance and egress of water; and through these the respiratory organs, which are situated within the cavity, are regularly supplied with the pure fluid necessary for aerating their blood; and the mouth, when it is not capable of being projected beyond this cavity, is supplied with food by the same stream.

The Mollusca possess in general a very complicated digestive and circulating apparatus; but the organs of sensation and voluntary motion are comparatively undeveloped. The great bulk of their bodies is made up of the stomach and intestines, the liver and other glands connected with the alimentary canal, the respiratory apparatus, and the ovary for the production of germs (which is usually very large); and the muscular system, which in the Articulata forms so large a proportion of the whole structure, is here frequently reduced to a few scattered fibres, and in but few instances attains any complexity and power. A considerable number of Mollusca are formed for an existence as completely stationary as that of the Zoophytes, and are dependent for their nourishment on the supplies of food casually brought within their reach by the waves and currents of the ocean. A few, however, have powers of locomotion which enable them to search actively for it themselves; but the greater number wander sluggishly, like the snail, from place to place, devouring with voracity such supplies as they meet with, and being capable of fasting for long intervals when none come in their way.

It is from the surface of the mantle that the calcareous matter is exuded which forms the shell, in those species which possess such a protection; its particles are held together by a sort of glue, which exists in much larger proportion in some species than others. In very hard and brittle shells, if the calcareous matter be removed by the action of an acid, the animal matter that remains appears in the form of separate flakes. But in many other shells thus treated, the animal portion retains its form after the removal of the lime; and there are a few in which the (so-called) shell consists only of a substance like horn, without any intermixture of calcareous particles. Such a substance appears to be formed by the young animal before the true shell is secreted; and it is also the first that appears when the animal is repairing the effects of an injury to the old one. It is this that constitutes what is commonly termed the *epidermis* of shells—a covering possessed in their natural state by all that are not enveloped in a fold of the mantle, but which is commonly removed when the shell is preserved, as it impairs the beauty of the exterior. The shell is most solid and massive in those species which lead an inactive life; and is usually light and thin, or altogether deficient, in those whose powers of locomotion are greater. Its thickness often varies greatly among different individuals of the same species, according to the roughness or tranquillity of the waters they inhabit.

As the shells of Mollusca are the parts of their structure by which they were best known, it was natural that the first attempts at classification should be founded on their peculiarities. Accordingly, Linnæus arranged them into *Univalves*, *Bivalves*, and *Multivalves*, according to the number of pieces of which the shell is composed; and this classification, from its simplicity and the apparent facility of its application, has been very generally adopted. But, as will hereafter be seen, it is only within certain narrow limits that the character of the animal can be known by the structure of its shell; and, by the Linnæan classification, animals are brought together which are widely separated, and others are placed in distinct classes which are closely allied. Again, such a classification is totally inapplicable to the very numerous shell-less Mollusca, some of which approach so closely to those bearing shells (as for instance the *Slug* to the *Snail*), that scarcely any essential difference exists. It is obvious, then, that although the characters derived from the shell may often be valuable in enabling us to recognise the remains of particular animals, classification must not be founded on them, but on the general conformation of the animals by which they are produced.

Following this principle, the Mollusca may be divided, first, into those having *a head*—that is, a prominent part of the body on which the mouth is situated, with organs of sense in its neighbourhood—and those which are *acephalous*, or headless. Among the former we perceive three very distinct types of structure.

The Cephalopoda, or *Cuttle-Fish* tribe, have feet or tentacula arranged in a circular manner around the head. In this group we find the nearest approximation to the Vertebrata.

The Pteropoda constitute a small but interesting class, characterized by the possession of a pair of winglike expansions of the mantle, and by the great symmetry of their bodies. These expansions serve as fins, by which they swim through the water with great velocity.

The Gasteropoda are the most extensive group of the whole. The two former are confined entirely to the sea; among these we find species adapted to live in fresh water, and even on land. They have but one muscular expansion or foot, and this proceeds from the under surface of the body, as may be well seen in the Snail.

In each of these orders we observe a considerable variation in regard to the relative size and even the existence of a shell; for while there are some species in all of them which are entirely destitute of this protection (such being called naked Mollusca), there are others which possess it in a slight degree, having it generally concealed in a fold of the mantle, while in others it completely envelops the body, when they desire to withdraw

themselves under its protection. In the different species of Snail and Slug, all agreeing closely in general structure, every variety of this kind may be seen.

In the headless Mollusca, on the other hand, we find two very distinct groups; in the first of which the shell is constantly present, while in the second it is as invariably absent. The general structure of the latter is much inferior to that of the shell-bearing class, and it approaches more nearly in several of its characters to the Polypifera.

The highest class of Acephalous Mollusca is named Conchifera, from the constant occurrence of a shell, which is nearly always formed of two pieces, or *bivalve*.

The lowest is denominated Tunicata, the shell being replaced, as it were, by a leathery or cartilaginous envelope or tunic, which encloses the whole body.

CLASS XIV.—CEPHALOPODA.

The class of Cephalopoda, which is so named from the arrangement of the feet or locomotive organs around the head, must be regarded as the highest among the Mollusca in respect to the complexity of its organization, and it is the one which approaches most nearly to vertebrated animals. In the general form of their bodies, and in their adaptation to a rapid motion through the water, many species bear a considerable resemblance to Fishes, and are, indeed, commonly reputed as such. The name of the class expresses the character which distinguishes it from all others. On the head, which is furnished with eyes resembling those of higher animals, and also with organs of hearing, and perhaps also of smell, are disposed in a circular manner the curious appendages, which have received the names of *feet* or *arms*, and to which either term may be justly given, as they are organs of prehension as well as of locomotion. These are usually eight or ten in number; but in the true *Nautilus* they are much more numerous, amounting to nearly a hundred.

The mouth, which is situated in the centre of the circle of arms, is provided with a pair of firm horny mandibles or jaws, of which one is sharply pointed, and overlaps the other when closed, so that the whole very much resembles the bill of a parrot. This beak encloses a large fleshy tongue, roughened with horny prickles; and the œsophagus leads to a muscular stomach, which much resembles the gizzard of birds. All the Cephalopoda are aquatic, and consequently breathe by gills. These are disposed symmetrically on the two sides, and are covered in by the mantle. This envelope includes the whole body, but there is an opening in which it gives passage to the head. Through this opening the water enters to the gills, and it is expelled through a tubular prolongation of the mantle termed the *funnel*, which also serves as the excretory canal for other fluids.

Most of the Cephalopoda possess something analogous to the shells of other Mollusca, although it often exists in a form and position which might almost prevent its being recognised as such. The only species at present known in which the body of the animal is enclosed within it, as in the shells of Gasteropoda, are the *Nautilus* and the *Argonauta* (Paper-Nautilus). In the former of these the shell is spiral, and is divided by transverse partitions into chambers, in the last or outermost of which the animal lives; and when it wishes to enlarge its shell, it prolongs the mouth of it, which widens as it is prolonged, and throws a new partition across the bottom. The shell of the Argonaut has no such chambers, and the animal, when hiding within it, occupies the whole of its cavity. In the common *Sepia* (Cuttle-Fish), on the other hand, the shell is reduced to the form of an oval plate, commonly known as the *cuttle-fish bone*, from which pounce is derived, that may be picked up on almost every shore; and this is enclosed within a fold of the mantle, and lies upon the back of the animal. In some of the more slender and flexible species even this is nearly wanting; all that remains of a shell in the *Loligo* (Squid) being a narrow horny plate, somewhat resembling a feather in shape, whence it is termed the *pen*.

The arms of all the Cephalopoda are covered with very curiously constructed suckers, by which they are enabled to take firm hold of any thing to which they are applied These act by excluding the air, and thus producing a vacuum, exactly upon the principle of the boy's leather sucker. In this manner they are enabled to master animals which it would have been supposed entirely out of the power of their soft unprotected bodies to combat successfully. They are generally agile as well as voracious; and prey upon almost all other classes of marine animals. Their special articles of food, however, are Fishes and Crustacea; and they are probably the only animals which are able to restrain the inordinate multiplication of the larger members of the latter class. The firm armour of the crab or lobster, and its powerful claws, are no protection to it against these soft-limbed cuttle-fish, which wind their arms round their bodies, and, fixing every part by means of their suckers, tear apart the divisions of the shell by means of their hard parrot-like bills. So firmly do these suckers adhere, that, while the muscular fibres remain contracted, it is easier to tear away the substance of the limb than to release it from its attachment.

The Cephalopoda which are unprotected by an external shell, are furnished with a curious means of escaping from their enemies. This is the secretion of a dark fluid, which, when emitted by the animal, tinges the water around to such a degree that it can escape in the cloud it has made. The fluid is usually stored up in a bag communicating with the funnel through which it is ejected under the influence of alarm. This ink-bag, as it is termed, is collected from the species inhabiting the Indian seas; the ink forms a valuable pigment, known to the artist as *sepia*, the name of the animal which furnishes it.

The class of Cephalopoda may be subdivided into two orders. In the higher division, which approaches the nearest to vertebrate animals, the *branchiæ* or gills are two in number, and the order is termed Dibranchiata, while in the one most closely allied to the Gasteropod Mollusca, the branchiæ are four in number, and the order is therefore termed Tetrabranchiata.

Order I.—Dibranchiata.

The Dibranchiate order includes all the best-known forms of the class. It is divided into two tribes, in one of which there are but eight arms, while in the other there are ten, of which, however, two are different from the rest. The first of these, termed Octopoda, may be considered as the highest in point of general organization; the second, termed Decapoda, presents many points of approach to the Tetrabranchiate order, both in the increased number of arms, and in the presence of an inner circle of short tentacula, as well as in several internal characters. The *Sepia*, or common Cuttle-Fish, is a characteristic example of the Decapod family. Some species of it abound in almost all seas. It has two long slender arms, which are furnished with suckers only at their extremities; and by these the animal is said to fix itself, as by anchors, when exposed to a rough sea or strong current. They are probably employed also in seizing prey, which is brought by them within the range of the others.

To this group we are probably to refer the *Spirula*, a little chambered shell, the animal of which is very imperfectly known; and a large number of fossil chambered shells, known as *Ammonites*, *Belemnites*, &c.; the animal of which was probably analogous to the Sepia,

including the shell, like the bone of the cuttle-fish, within the body.

The Octopoda, which form the highest family of the Dibranchiata, have but eight arms, without tentacula; and they are destitute of lateral fins, so that they depend entirely upon the arms for their movement through the water. Accordingly it is found that these are very large and powerful, and that the body is proportionally short. The arms are generally united at their bases into a kind of circular fin, by the motion of which the animal can swim backwards with great energy. The common *Octopus*, or *Poulp*, of European shores, has the arms six times the length of the body, and each furnished with 120 pairs of suckers. It can leave the water, and creep over the beach; taking hold of the ground before it by the extension of its arms, and then dragging the body towards the point at which the suckers are attached.

A very interesting species of the Octopod group is the *Argonauta Argo*, commonly called the *Paper-Nautilus*, from the whiteness and delicacy of its shell. As the animal has little in common with the true Nautilus, it would be much better if the latter designation were entirely abandoned, and the term *Argonaut* substituted for it. The shell is not chambered, but possesses one spiral cavity, into which the animal can withdraw itself entirely; this, however, has no muscular attachment to it, whence it has been supposed by many naturalists that it was only a parasitic inhabitant, which had taken up its abode within it, and that the shell, from its resemblance to that of Carinaria, was formed by a Gasteropod mollusc allied to that genus. It has been lately proved, however, by the interesting experiments of Madame Power, that the shell increases regularly with the growth of the animal, which possesses the power of repairing it when injured: so that no doubt can exist that the Argonaut is the original constructor of it.

Of the eight arms of the Argonaut, six taper gradually towards the extremities; but two are expanded into wide membranous flaps. From very early times, this animal has been reputed to swim on the surface of the water, using its arms as oars, and spreading these expanded

Shell of Argonaut, with animal in the reputed position.

membranes as sails to the wind. But it is now known, by accurate observation of the living animal, that this is altogether a fiction (though an interesting one); and that the expanded arms are spread over the sides of the shell, meeting along its keel or edge, and almost completely enclosing it. It is by these, indeed, rather than by the surface of the body itself, that the calcareous secretion is poured out for the enlargement or separation of the shell. By the action of the arms, the Argonaut swims backwards in the same manner as other Octopoda, and it can also creep along the bottom of the sea.

Order II.—Tetrabranchiata.

From the remains preserved in a fossil state, the Tetrabranchiata appear to have formerly existed in our seas; but the only living representative of them is the *Pearly Nautilus* (*N. Pompilius*). In the animal which forms and inhabits the well-known chambered shell found on most tropical shores, we observe many differences from the usual type of organization in the Cephalopods. The arms are very numerous, amounting to nearly a hundred; they are unprovided with suckers; and they are short and slender, resembling closely the tentacula of many Gasteropods.

The head of the *Nautilus* supports a large fleshy disc, upon which it is believed that the animal crawls upon the bottom or sides of the ocean, as a snail upon its foot. The animal frequents deep waters; and, though it is occasionally found at the surface, it sinks upon the least alarm, so that it has been very rarely captured, although the empty shell is so common. This power of rising and falling in the water appears in some degree connected with the structure of the shell, and with the mode in which its chambers communicate with the body by a membranous tube which passes through all the partitions, and is called the *siphuncle*. But of the mode in which this operates no very satisfactory account has yet been given.*

A large number of fossil shells, analogous to that of the Nautilus, and hence called *nautilites*, are found in various strata, from the oldest limestones and sandstones of the Silurian system, to those covering the chalk.

CLASS XV.—PTEROPODA.

The Pteropoda are a small but remarkable class of Mollusca, distinguished by the adaptation of their structure for active locomotion in water only. Their general organization is higher than that of the Gasteropods; and they are particularly distinguished by the possession of a pair of fin-like organs, which are attached to the anterior part of the body, and are evidently adapted for propelling it rapidly through the water. The body is uniformly symmetrical; that is, its two sides precisely correspond—a condition obviously favourable for rapid movement. It is from the wing-like character of these lateral appendages that the name of the class is derived.

The dimensions of the animals composing this class are uniformly small; but the number of individuals which associate together in shoals is often enormous, so that the sea appears literally alive with them. Some of them are possessed of a shell, whilst others are unprovided with such a protection. Wherever it exists it is very light and delicate; and it seldom covers more than the posterior part of the body. In one beautiful little Mollusc, the *Cymbulia*, it is of a slipper form, the wings or fins issuing from the large opening. The head is usually prominent, possessing eyes and sensitive tentacula; and the interior organization is of very complex nature.

One of the best-known genera of this group is the *Clio*, which abounds both in the arctic and antarctic seas, and is a very important article of food to the whale. The aspect of this animal will convey a good general idea of that of the whole class. The Clio is itself eminently carnivorous, and in its whole organization is fitted to seize and prey upon the yet more minute inhabitants of the deep.

The *Clio Borealis* is well known to the whale-fishers and others as *whale's food*; this species swarms in the arctic seas, and when the weather is calm, these little animals may be seen floating in myriads upon the surface. According to Cuvier, the sea is sometimes so covered with them, that the whales cannot move their

* See Dr. Buckland's Bridgewater Treatise for an attempted explanation. This is deficient in its application to all those cases in which the siphuncle is a shelly not a membranous tube, as in the *Spirula*, *Ammonite*, &c.

mouths without engulfing thousands of these small Mollusca. An analogous species, the *C. Australis*, ap-

Clio Borealis

pears equally abundant in the polar regions of the southern hemisphere.

CLASS XVI.—GASTEROPODA.

It is in the animals of this class that we find the characters of the Mollusca most prominently displayed, namely, the high development of the nutritive apparatus, with very feeble powers of locomotion. In all the more perfect forms, which are usually carnivorous, a distinct and prominent head exists, furnished not only with *tentacula*, or feelers, but also with eyes, and with what appear to be rudiments or organs of smell and hearing. In this part, we usually perceive that *symmetry* or correspondence between the two halves, which has been spoken of as characterizing the *animal* organs in general; whilst in the posterior part of the body, which is made up of the organs of vegetative life, this symmetry is seldom to be discerned. They have the power of crawling from one place to another, by means of the expanded muscular disc or foot with which they are furnished; and as this foot proceeds from the belly or under surface of the animal, the class receives the name given to it. The mode in which it is used may be well seen by placing a snail or slug on a piece of glass, and looking at it from the under side. Many of those which inhabit the water can swim with considerable rapidity; but this power is chiefly possessed by those species which have no shell, or but a very slight one, and can bend their bodies in any direction.

The general character of the shelly structure, where it exists, is the same as in the Conchifera. It is in general composed of one piece, and called a *univalve*; in some instances, however, it is a *multivalve*: and in many species there is a small *operculum* or lid to the mouth of the shell, which may in some degree be regarded in the light of a second valve. The body is attached to the interior of the shell by muscles which can withdraw it or project it at the will of the animal; and the operculum can be drawn down upon the mouth with considerable force. It is the habit of some species (as the Limpet and Haliotis) to attach themselves, by the expanded surface of the foot, to rocks, &c.; these are able to draw the shell closely down upon the rock, with great muscular power, just as the Conchifera draw together their valves; a short interval existing, however, when the animal is not alarmed, for the admission of water or air to the cavity of the shell. A very slight irritation will cause the animal to draw the shell close down on the rock, from which it is then very difficult to detach it.

The shell is formed, as in other Mollusca, by an exudation from the mantle; and is enlarged at intervals, in accordance with the increasing size of the animal. In some, the addition of an entire new interior layer, projecting beyond the old one, is made at every such period, as in the Conchifera; but in others the new matter is secreted only at the edge of the previous shell, and is joined on, as it were, to it; in these the line of addition is usually marked by a prominent rib on the exterior, but the interior is beautifully smoothed off.

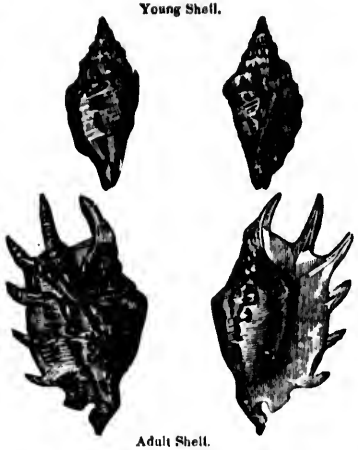
The forms of the shell in this class vary extremely; but those which appear most widely separated may be shown to be connected by intermediate links. The open cone of the *Limpet* may be regarded as one of the simplest forms; in an allied genus, the *Pileopsis*, we find the point prolonged, and somewhat rolled upon itself; and by various links of this kind, we are brought to the regular spiral of the snail. From this we may return to the long straight form by the *Scalaria*, in which the coils of the spire touch each other only by their ribs; and by the *Vermetus* and *Magilus*, in which the commencement only of the shell possesses a spiral form, the remainder being prolonged into a straight tube. When the shell is spiral, and the point and mouth are not in the same plane, a sort of central pillar is formed, like that round which a spiral staircase is constructed. This is called the *columella*; and it is usually grooved at its lower part, for the passage of water to the respiratory organs, which are placed within the shell.

The margin of the shell is not unfrequently fringed with spines, as in the *Murex*; these are formed, like similar appendages in the Conchifera, by prolongations of the mantle; and the dissimilar number of them in different specimens has caused the establishment of many species, which, now that the habits of the animal are better known, prove to be but different forms of the same. For it has been ascertained that the animal has not only the power of forming new spines, but of removing old ones, especially such as would interfere with the continued growth of the shell. The edge of the mantle is applied against their bases, and a kind of absorption of shelly matter seem to take place—a notch being formed, which causes them to be easily broken off. Various analogous changes are produced by a similar action in other shells, the portions first formed being wholly or partially removed. Sometimes the walls of the older portion are thinned, for the purpose of lightening the shell; and in other cases the top of the cone is altogether removed, a groove having been formed around its interior, which renders it so weak as to be easily broken off: in these last cases, the animal previously withdraws itself from the part that is thus to be separated, and throws a new partition across, by which the top of the shell remains closed after the division. A shell thus deprived of its apex is said to be *decollated*.

Murex Tenuispina

It is not only by such removals that the form of univalve shells undergoes a great change. Sometimes additions are made to them, which completely alter their figure, so that two individuals of different ages would be scarcely supposed at first sight to belong to the same tribe. But in all these cases the form of the young shell may be traced in that of the adult. The preceding figures of the *Pteroceras* show this change in a moderate degree; in other genera it is much more remarkable. In another group of shells, of which the common *Coury* is an example, a still more curious alteration takes place. In the

Young Shell.



Adult Shell.

Pteroceras Scorpio.

young shell the edge is sharp, and the mouth or opening of considerable breadth. This state continues as long as the shell is increasing in size; but when it has arrived at adult age, the outer lip is thickened, and brought so near the other as to leave but a narrow chink between them. At the same time, a prolongation of the mantle on each side deposits a new layer of shelly matter on the outside of the previous one; and as the two prolongations meet along the back (the line of their junction being usually evident on the shell), this additional coat, which is very hard and *porcellanous* in its texture, encloses the whole previous shell.

Young Shell.

Adult Shell.

Cypræa Exanthema.

The *operculum* is principally confined to the aquatic Gasteropods. It is sometimes of the same texture as the shell itself, and sometimes horny. It does not always close the entire mouth of the shell, but it is sometimes made to fit it, at all stages of growth, with the most beautiful accuracy. Some of the land species also possess an operculum; but in general they are destitute of it, and they form during hybernation a temporary closure to the mouth of the shell by a viscid secretion, which hardens into a thin plate, and includes within it a bubble of air. Behind this, a second and even a third similar partition is occasionally found, as in the common snail.

The subdivision of this extensive class into orders, may be best effected by arranging the different tribes according to the character and position of the respiratory organs. The following are those adopted by Cuvier

1. Pulmonia. These are terrestrial species, adapted to breathe the air by means of a pulmonary sac or air-cavity, the orifice of which they can open or close at will. Many have no shell.

2. Nudibranchiata. These, as well as all the succeeding orders, are aquatic, being adapted to respire water by gills, like other Mollusca. The animals of this order have no shell, and they carry their branchiæ, which present various forms, on some part of the back.

3. Inferobranchiata. These are similar in many respects to the preceding, but the branchiæ are situated under the margins of the mantle.

4. Tectibranchiata. In the greater part of the animals contained in this order, the branchiæ are situated upon the back or on the side, and are covered in by a fold of the mantle, and this fold usually includes a shell more or less developed.

5. Heteropoda. This is a small order, characterized by the peculiar form of the foot, which is not spread out horizontally, but compressed vertically into a sort of fin. They carry their branchiæ, the tufts of which are generally protected by a shell, upon the back.

6. Pectinibranchiata. The animals of this order, to which belong all the spiral shells, except those of the Pulmonea, are so named from the comb-like form of their gills, which are usually situated in a cavity behind the head, corresponding with the respiratory sac of the Pulmonea. This is by far the most numerous order of the whole.

7. Turbulibranchiata. These have many affinities with the last order, but the shell is spiral only at its apex, where it is commonly fixed to (or rather enclosed by) other bodies, and is prolonged in the shape of a tube more or less regular.

8. Scutibranchiata. In these, also, there is a considerable resemblance to the Pectinibranchiata in the form and position of the gills; but the shells are very open, scarcely in any degree spiral, and cover the body and gills like a shield; and they also differ essentially in their mode of reproduction.

9. Cyclobranchiata. These molluscs have their gills disposed in little tufts under the margins of the mantle, much as in the Inferobranchiata; but they have shells which are spread out over the body, and differ from that order in the mode of reproduction.

Order I.—Pulmonea.

Although the greater part of the Molluscs of this order live on land, some are aquatic; but these, like the aquatic air-breathing Insects and Vertebrata, are obliged to come occasionally to the surface to breathe. They all feed chiefly upon vegetables, and many of them exclusively so; but some are extremely voracious, and will devour almost any organized matter that falls in their way. They are diffused through all climates, particular species being restricted to each. Those without a shell, commonly known as Slugs, constitute the family Limacina. In the common *Slugs*, as in most of the terrestrial species of this order, we observe a prominent head, with four tentacula, and at the end of the longer pair the eyes are situated. These tentacula can be drawn inwards, by a process resembling the inversion of the finger of a glove. On the back there is a kind of shield or disc formed by the mantle, which sometimes encloses a small shell. This shield covers the pulmonary sac, the opening of which is on its right side, and the head can be withdrawn beneath it. The *Testacella* is a kind of slug which has the disc of the mantle at the posterior extremity, and this always contains a small shell. This animal, which feeds largely on earth-worms, is abundant in the south of France, and has been introduced into the gardens of this country, where it is multiplying rapidly.

The *Snails* and their allies, constituting the family HELICIDÆ, are closely allied to the Slugs in organization; differing in but little else than the possession of a shell into which the body may be withdrawn. The common garden-snail of this country, and the *Helix pomatia*, or edible snail of France and Italy, are well-known examples of this family. More striking ones are to be found, however, in tropical climates; where some species of the genus *Bulimus* attain to great size, the eggs being as large as a pigeon's. In some species the direction of the coils of the shell is opposite to what it is in other spiral shells; such are said to be *reversed*. A European species of this genus is one most remarkable for the decollation of its shell. Another large snail of tropical climates, as the *Achatina*, which feeds on trees and shrubs, chiefly on the western coast of Africa, and in the West Indies. Several of its species are distinguished by the beauty of their colours.

The aquatic Pulmonea have only two tentacula. From the necessity of coming to the surface to breathe, they can only live in water of inconsiderable depth; and they chiefly inhabit ponds and shallow streams, or the banks of rivers. Some, however, live on the sea-shore. The *Planorbis*, the shell of which is quite flat, having all its coils upon the same level, is a very common genus in this country; as is also the *Lymnæa*, which feeds upon seeds, as well as the softer parts of plants, and the stomach of which has a very muscular gizzard.

Order II.—Nudibranchiata.

The animals of this order, which might be designated Sea-Slugs, are all marine; and being adapted to breathe water at any depths, and also, in many instances, to swim with facility, they are often found at a great distance from land. When they swim it is usually in a reversed position, the foot being turned upwards; this is made concave by muscular action, so as to serve as a kind of boat, the buoyancy of which keeps the animal at the surface without effort. This order is a very numerous one, and some of its species attain a considerable size; but, from their habits, little is known of them.

Order III.—Inferobranchiata.

The few Molluscs contained in this order differ but little from the last, except in the position of their gills, and their incapability of swimming. They are, therefore, confined to the sea-shore; where they subsist, as do the Nudibranchiata, upon sea-weeds and other aquatic plants.

Order IV.—Tectibranchiata.

This order begins to show an approximation towards that disposition of the gills which characterizes the great bulk of the class; the animals composing it are marine, and live chiefly on the shore or on floating sea-weeds. A very characteristic example of the order is the *Aplysia*, commonly termed Sea-Hare, which is abundant on many parts of the British coasts. Its vernacular name is probably derived from the peculiar form of the superior pair of tentacula, which are flattened and hollowed, like the ears of a quadruped. The head has a very distinct neck. The branchiæ consists of leaflets arranged in a complex form, and situated on the back, beneath a fold of the mantle, which also encloses a flat horny shell. The digestive apparatus is very complicated; consisting of a membranous crop like that of birds, a gizzard having cartilaginous walls, and a third stomach beset with sharp hooks in its interior. These animals feed on sea-weed. They are very sluggish in their movements; but have a peculiar means of defence, consisting of a deep purple liquid, which they can discharge from the edge of the mantle when alarmed, and by which the surrounding water is discoloured, so that they cannot be discerned.

Order V.—Heteropoda.

This is a very small order; but the animals contained in it differ remarkably from all other molluscs. At the edge of the vertical muscular plate, which has been mentioned as occupying the position of the foot in the other Gasteropods, is a small conical sucker, by which the animal can attach itself, and which represents the expanded disc of other orders. The gills are placed on the back, and close behind them are the heart and liver, which seem, as it were, external to the body. In one of the few genera which the order contains, these parts are protected by a small shell, whilst in another there is none. The body, consisting of a semi-transparent gelatinous substance, enclosed in a muscular envelope, is elongated, and generally terminated by a compressed tail; this body can be distended with water. The animal swims in a reversed position, the fin-like foot being uppermost, and the shell depending below. They are limited to warm latitudes: one species of the Carinaria inhabits the Mediterranean, and occasionally appears on particular coasts in large numbers; whilst others are peculiar to the tropics, where most of the allied genera also exist. The shell of the Carinaria is interesting, on account both of its extreme delicacy and fragility, and on account of the strong resemblance which that of the Argonaut or Paper-Nautilus bears to it.

Order VI.—Tectinibranchiata.

This order is not only by far the most numerous in the whole class, but contains the animals which may be regarded as its most characteristic examples. They have all two tentacula and two eyes, sometimes raised on stalks, as in the snail. The mouth is prolonged into a sort of proboscis; and the tongue is furnished with little hooks or recurved spines, which enable it to wear down the hardest bodies by slow and oft-repeated action. The cavity in which the gills are fixed occupies the last whorl of the shell; and in some of the order there is a tubular prolongation of the mantle, termed the *siphon*, for the purpose of conveying water into this cavity, so that the animal can breathe without leaving its shelter. By the presence or absence of this organ, and by the form of the shell, which here appears to bear a sufficiently constant relation with that of the animals, this large group may be arranged under the following families:—1. TROCHOIDÆ, in which there is no siphon, and which have the mouth closed by an operculum. Of this the common periwinkle is a characteristic example, though very small in proportion to tropical species. 2. CAPULOIDÆ, which have a wide open shell, very much like that of the limpets, without operculum or notch in the margin for the passage of a siphon. 3. BUCCINOIDÆ, which have a spiral shell, and a canal at the end of the columella for the passage of the siphon; this is sometimes extremely prolonged, as in the Murex; and the genera exhibiting this character are all carnivorous in their habits. To this family belong the animals forming the greatest number of marine univalve shells preserved in cabinets.

Order VII.—Tubulibranchiata.

The Molluscs of this order construct an irregularly tubular shell, which so much resembles that formed by certain Annelida, as to be scarcely distinguishable from it. They are very few in number.

Order VIII.—Scutibranchiata.

This order is also a small one, containing but two principal genera, which do not differ widely from the limpets, except in the disposition of the gills. The shells are very open, without an operculum, and the greater number are not in any degree spiral. In the *Haliotis*, the shell is slightly twisted; and from a faint resemblance it is thought to bear to the ear of a quadruped, it has been called the Sea-Ear. This animal, in its living state, is one of the most beautiful of Gasteropods, on account of the variety and richness of its colours. Its shell, when the surface is polished, possesses a pearly lustre, with resplendent metallic hues. It is consequently much sought for as an ornament.

Order IX.—Cyclobranchiata.

The general form of the *Limpets*, which principally compose this order, is well known; and the peculiarity in the position of their gills has already been mentioned. Closely allied to the limpets in general structure, but differing remarkably in the formation of the shell, are the *Chitons*, of which some small species inhabit our shores, but which attain to much greater size between the tropics. Their shell is composed of a number of plates arranged behind one another with great regularity, and connected by a very complex series of ligaments and muscles, which reminds the naturalist of those which unite and move the different segments in the articulated animals.

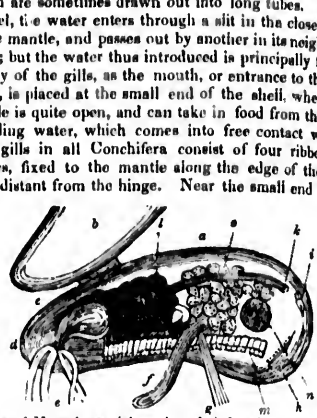
CLASS VII.—CONCHIFERA.

This class is nearly synonymous with that of *Bivalves* in the Linnean arrangement, since all the animals which construct bivalve shells belong to it; but it also contains a few species whose shells are *multivalve*, and some others in which there appears at first sight an entire departure from the usual form. The molluscs belonging to this class are, in common with the Tunicata, destitute of a head; that is, the mouth is not situated upon a prominent part of the body, nor assisted in its choice of food by organs of special sensation in its neighbourhood, but the entrance to the stomach is buried between the folds of the mantle. Hence these two groups were associated by Cuvier into one class, to which he gave the name of ACEPHALA, or Headless Molluscs; but there is quite sufficient reason for separating them, on account of the superior organization of the group at present under consideration.

The part of the structure of these animals which is best known, is the *shell*. This is composed of particles of lime, exuded from the surface of the mantle, in combination with a gluey secretion, by which they are united together. If one of the valves of a bivalve shell be examined, it will be seen to consist of a number of layers, of which the outer one is the smallest, each inner one projecting beyond the one which covers it. This is more evident in such shells as that of the oyster, in which the layers adhere loosely together, than in others in which they are more compact. The shelly matter is thrown out at intervals from the surface of the mantle; and as the animal enlarges at each interval, the new layer extends beyond the old one. In this manner, a constant relation is preserved between the size of the animal and that of its shell; and the addition of the newly-formed portions, not to the edge only, but to the interior of the whole previous shell, strengthens the latter in proportion to its increase in size.

The valves are connected together in various ways. In the first place, they are jointed by a *hinge*, which is in some instances so firm and complicated that it holds them together when all the soft parts have been removed. This hinge is sometimes formed by the locking of a continuous ridge on one valve into a groove in the other, and sometimes by a number of little projections or *teeth*, which fit into corresponding hollows in the opposite valve. In the neighbourhood of the hinge (sometimes outside, sometimes inside, or both) is fixed the *ligament*, which is composed of an elastic animal substance; this answers the purpose of binding the valves together, and at the same time of keeping them a little apart, which may be regarded as their natural position. When the animal wishes to draw the valves closely together, it does so by means of the *adductor* muscle, which is fixed to the interior of both valves at some distance from the hinge, and of which the insertion can be easily traced by a somewhat rough depression of the interior surface of each valve. In some Conchifera, this muscle is single, and in others it is double, the two parts being even at opposite ends of the valve. Upon this character it has been proposed to found the primary division of the class into orders; but the classification thus formed is not a natural one, inasmuch as it brings together kinds which have little resemblance, and widely separates others which are closely allied.

In order to describe the general structure of the Conchifera, it will be advantageous to select some particular illustration; and the common *mussel* is well adapted to this purpose. On opening such a shell, it is seen that the two valves are lined by a membrane which corresponds with the tunic or *mantle* of the Tunicata. This is divided into two halves along a considerable part of the edge of the valves, but is united near the large end. In some Conchifera, as will be presently noticed, the two halves of the mantle are separated along their whole extent; whilst in others, as in the Tunicata, they are completely closed, with the exception of the two orifices for the ingress and egress of water, which are sometimes drawn out into long tubes. In the mussel, the water enters through a slit in the closed part of the mantle, and passes out by another in its neighbourhood; but the water thus introduced is principally for the supply of the gills, as the mouth, or entrance to the stomach, is placed at the small end of the shell, where the mantle is quite open, and can take in food from the surrounding water, which comes into free contact with it. The gills in all Conchifera consist of four ribbon-like fringes, fixed to the mantle along the edge of the shell most distant from the hinge. Near the small end of the



Interior of Mussel; *a*, right valve; *b*, left valve; *c*, hinge; *d*, stomach; *e*, tentaculæ; *f*, foot; *g*, byssus; *h*, branchial orifice; *i*, vent; *k*, termination of intestine; *l*, liver; *m*, gills; *n*, adductor muscle; *o*, ovarium.

shell is seen the stomach, with the short tube leading to it, the orifice of which is furnished with four tentacula or feelers. To the right of this is seen the long and complicated intestinal tube, with the liver lying in separate masses amongst its folds. And nearer the large end, the cavity of the shell is chiefly occupied by the ovarium, in which the eggs are formed. Close to this is the powerful adductor muscle, by which the valves can be drawn together with considerable force. The intestinal tube is seen to terminate near the opening of the posterior (or right-hand) extremity of the shell, which discharges its contents, and serves for the exit of the respiratory current.

The foregoing description will apply, with slight variations, to the structure of almost all Conchifera; but we have now to notice two organs, which are absent in some, and in others more largely developed than in the present instance. From the lower part of the shell, passing out between the separate edges of the mantle, is seen the *foot*, a fleshy muscular organ, somewhat resembling the tongue of higher animals, and not containing any hard support, or being protected by any envelope. This foot, which is the only special locomotive organ possessed by the Mollusca of this class, serves a great variety of purposes, sometimes enabling the animal to leap with considerable agility along a hard surface, sometimes being used to bore into the sand or mud, and sometimes serving only to affix the animal to some firm support. From the base of this foot there proceeds, in the mussel, a band of hair-like filaments, forming what is called the *byssus*. These sometimes exist in great abundance, and serve, by being fixed by their extremities to the shore or bottom of the sea, to anchor the shell, and yet to allow the animal considerable freedom of motion within certain limits. Frequently the byssus is altogether absent.

The Conchifera have usually more power of locomotion than the Tunicata. Some of them, however, as the oyster, are attached to one spot during all but the earliest period of their lives. Others adhere by the byssus, or by the foot, by which they obtain a certain range; and others are free during the whole of their lives, swimming and leaping with considerable agility. In these movements some of them appear to be directed by powers of sight, and in these are perceived small red spots at the edges of the mantle, which are believed to be eyes. They do not appear to have much choice of food, nor are they provided with any other means of obtaining it than the ciliary action, which introduces constant currents of water into the mouth. In general they do not attain any great size, but they are on the whole larger than any Molluscs except the Cephalopoda; and a few species attain considerable dimensions —a *Pinna* having been known four feet long, and a *Tridacne* (Giant Clamp-shell) having been known to weigh 600 lbs. They are distributed over the whole globe principally frequenting the shores or shallows. Each region has certain species peculiar or most abundant in it, and there are few which are not limited to one hemisphere. The temperate zone appears as favourable to the development and multiplication of some species as the torrid zone to others; but the largest kinds are only found in warm latitudes.

In the subdivision of this class into orders, the degree in which the two lobes of the mantle adhere along the margin of the shell, is the character chiefly rested on; the presence or absence of the foot, and of the byssus, also, are important characters; and along with these the structure of the hinge should be attended to. On those grounds, the five following orders are established by Cuvier:—1. Ostracem, the *Oyster* tribe, in which the two halves of the mantle are separated the whole way round, or the foot absent or very small: they are usually fixed by the shell to solid bodies. 2. Mytilacem, the *Mussel* tribe, in which the mantle remains open in front (at the end where the mouth is situated) and closed behind, an aperture being left for the egress of the fluid. They have a foot strong enough to crawl by, and commonly affix themselves by a byssus. 3. Chamacem, or *Clamp-shells*; in these the mantle is closed, with the exception of three apertures, two of which are for the ingress and egress of water, and the third for the passage of the foot, which is here usually more powerful. 4. Cardiacem, or *Cockle* tribe, in which the mantle is not only closed, but extended at the respiratory apertures into tubes of greater or less length. The foot is very strong. 5. The Inclusa, in which the mantle has only one opening for the passage of the foot; at the posterior end it is prolonged into tubes of great length, that can be extended far beyond the shell, as in the common *Solens* or Razor-Shells.

Order I.—Ostracem.

The Ostracem, of all the orders, exhibit the nearest approach to the Tunicata, both in the absence of the foot, the entirely fixed condition of the body, and in the low grade of their organization in general. The shell itself is usually fixed by adhesion to other masses; in a few, the animal is attached by a byssus; and some species, which are unattached, have a slight power of changing their place, by suddenly closing their valves and squirting out the water that was between them. In the true *Oysters* there are no teeth in the hinge, which is held together by the ligament only. Several species exist, some of which are as abundant in tropical regions as the common Oyster of temperate seas is on the shores of Britain. Their continued abundance, notwithstanding the large quantities constantly being consumed, is less surprising when we reflect upon their astonishing fertility, as many as 1,200,000 eggs having been detected in a single individual. The *Pectens* have a hinge like that of the Oysters, but differ in having the surface of the valves raised up into ribs, and in having two angular projections, commonly termed *ears*, by the sides of the hinge. Many of them are very elegantly coloured, and they are the most active of the whole order, being entirely unattached, and swimming with greater quickness than would have been expected from their imperfect means of locomotion.

The foregoing tribes of Ostraceæ, and many more which might be enumerated, are distinguished by the presence of only one adductor muscle; in the remainder of the order, as in most other Bivalves, there exists a second. Among these may be first mentioned the *Etheria*, which is a sort of fresh-water oyster. The *Aviculæ*, which furnish the greater number of the pearls, so highly prized as ornaments, are called *Pearl Oysters*, from their general resemblance to the same tribe. The valves are extended into ears or wings, on each side of the hinge; and these are frequently very long on one side. The pearl is produced from the same substance as that which lines the shell, and which is commonly known as mother-of-pearl. It seems usually to result from some irritation of the mantle, which causes it to excrete an unusual quantity of pearly matter at one spot; and grains of sand, or other small particles, which, by getting between the membrane and the shell, seem to have caused such an irritation, are often found in the centres of pearls. Sometimes, again, pearls are found at points where the shell has been pierced by a boring animal; and it has been proposed to cause the formation of pearls by perforating the shell; but the pearls so produced seldom have that regularity in their form which is as important to their value as is their size. Pearls are also produced within many other shells. The *Pinnæ*, or Wing-shells, approach the Mussels in many respects; they are remarkable for the length and silky character of the byssus by which they attach themselves to rocks, and which is collected in the Mediterranean for the manufacture of gloves and other articles, for which it is well adapted by its strength and durability.

Order II.—Mytilaceæ.

The order Mytilaceæ is well represented by the common *Mussel*, which has been already described. The various species of this group are extensively diffused; and from their abundance in particular localities, and their palatability, they serve as important articles of food. Belonging to this order are some remarkable *boring* shells, which have the power of penetrating hard rocks, and making deep holes, which are enlarged as they advance, in accordance with the growth of the animals, and which, therefore, they cannot quit. By what means they accomplish this is unknown. The flattened form of the shell is a sufficient proof that it is not by mechanical action, as in some of the boring shells of the order Inclusa. The *Anodon* is a fresh-water mussel, closely allied in general conformation to those inhabiting the sea, but differing remarkably in the absence of teeth in the hinge, whence the name of the genus is derived. The *Unio* is another fresh-water genus, having a more complicated hinge. It is remarkable for the pearly aspect of the lining of the valves, and for producing small pearls, sometimes in considerable abundance. These are not so pure in their colour, however, as those of the Avicula, and are but little esteemed. Some species of Unio are common in the lakes and rivers of Britain, but the greater number are peculiar to North America; many of these are remarkable for their size and colour. There are some marine Mytilaceæ allied to the Unios, one of which burrows in coral.

Order III.—Camacem.

The order Camacem includes but a comparatively small number of species, most of which are peculiar to tropical climates. The most remarkable is the *Tridacna gigas*, or Giant Clamp-shell, of the Indian Ocean. When young, this animal attaches itself to rocks by means of its tendinous foot, which serves as a sort of byssus; but when its shell becomes so massive that it is in no danger of injury, it detaches itself, and the groove of the shell

is fille. *ap.* These animals, with their shells, sometimes attain the weight of many hundred pounds. Smaller specimens are often brought to this country; the valves being used to receive water from small fountains, &c.; and, on the continent, they are employed as reservoirs of holy water in the churches. The foot has a structure so tough, that, to separate the shell attached by it, it is necessary to chop it with a hatchet like a cable.

Order IV.—Cardiacea.

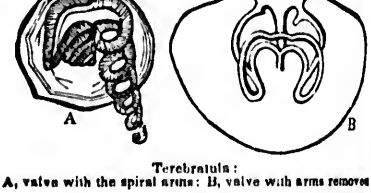
In the animals of the order CARDIACEA, or *Cockle* tribe, we usually find greater activity than in any others of the class. The foot now comes to be a very important organ, possessed of great muscular power, and capable of being applied to a variety of uses. Many of these animals bury themselves in sand or mud; and it is in these that we find the respiratory orifices prolonged into tubes. In the common Cockle, however, these tubes can scarcely be said to exist, the orifices not being prolonged beyond the shell. Its foot is very large, and can be bent nearly double in the middle; by doing this, and then suddenly straightening it, the animal is enabled to take considerable leaps. The hinge is very beautifully constructed; and the two valves lock closely together. The *Trigonia*, a very interesting genus, abundant in former ages of the globe, but now restricted to the shores of New Holland, seems allied to the cockle in the structure of its hinge and shell, in the size of its foot, and in its general organization, although its mantle is divided into two lobes along the whole margin of the valves, as in the oyster. This is an instance of the impropriety of basing our classification on any single characters. There are other Cardiacea which obviously conduct toward the next order. Such is the *Tellina*, of which the valves, when closed together, gape at the posterior extremity; and through this passage there pass out two long tubes which terminate in the branchial orifices and funnel. These tubes have an elastic structure, and can be entirely drawn within the shell. These long tubes are seen also in the *Venus* and its allies, of which one species is remarkable for the long spines which guard its posterior end; and also in the *Mactra*, and the animals allied to it. In some cases the tubes are united along their whole length, and appear to be single; but they are always in reality double. All these animals are in the habit of burying themselves in sand or mud, or in stones; and the tubes serve to introduce fresh water from the entrance of their burrows.

Order V.—Inclusa.

In the order Inclusa we usually find the valves, when joined together, presenting more or less of a cylindrical form, as in the common Razor-shell. A hollow is left at each end, and from one the foot is projected, through a passage in the mantle, while the other gives exit to the respiratory tubes, which are often prolonged to a great length. The animals live almost uniformly buried in sand or mud, in rocks or wood. The *Solen*, or Razor-shell, is a very characteristic example of the order, which contains, however, some forms that depart very widely from it. The foot, which can be projected from the lower end, is firm and pointed, and serves as an admirable boring instrument, by the use of which the animal can burrow in the sand with great rapidity, sinking very deep when alarmed. The *Mya* approaches, in the form of its shell, and in its general organization, to the previous family; but some of its species also closely approximate the Solens. The *Pholas* is a very interesting genus, the animal of which nearly resembles that of the Solen, while the shell is formed of several pieces, and would thence be called a *multivalve*. There are two principal portions, and a variable number of accessory pieces. Some species of this genus bore in mud, others in rocks, and a few in wood. Their action seems purely mechanical. They fix themselves firmly by the powerful foot, and then make the shell revolve; the sharp edges of this commence the perforation, which is afterwards enlarged by the rasp-like action of the rough exterior; and though the shell must thus be constantly worn down, yet it is replaced by a new formation from the animal, so as never to be unfit for its purpose.

We now come to some very remarkable forms of this order, in which the bivalve character of the shell gradually disappears, being replaced by a new structure of which no examples have been yet seen. The *Teredo*, or Wood-worm, as it is commonly termed, is an animal of the same general organization as the Pholas; but its valves are smaller in proportion to the body, and its tubes still more prolonged—at least when the animal may be regarded as full grown. By means of the mechanical action of its valves, it perforates timber, in the same manner as the Pholas penetrates stone. As it advances, the respiratory tubes are prolonged, so that their orifice remains at the entrance of the burrow, which is very small in proportion to the cavity formed by the animal as it increases in size. This orifice is furnished with a pair of valve-like shelly plates, termed *palmulæ*; by the action of which a current of water is driven towards the body of the animal, in order to serve for its respiration, and at the same time for the supply of its food. The gallery is lined by a calcareous exudation from the surface of the tubular prolongation of the mantle, which forms a kind of secondary shell. The Teredo is an animal extremely destructive to timber, especially in warm climates, from which it seems to have been originally introduced into the sea-ports of Europe. In other genera the valves are lost in the shelly tube, so that the ordinary structure of the class is no longer apparent.

Besides the orders now described as composing the class Conchifera, there is a very curious group which should also be included in it, although established as a separate class by many naturalists. This is the group of BRACHIOPODA, containing only three genera at present known, namely, *Terebratula*, *Lingula*, and *Orbicula*; but formerly of much greater comparative importance. These animals have all bivalve shells, differing in no essential particular from those of the Conchifera in general. The two former genera are attached, however, by a footstalk proceeding from an opening in one of the valves near the hinge, to solid substances; and in this respect they have an affinity with the Tunicata. The Orbicula is attached, like an oyster, by one of its valves. They bear considerable resemblance to the Tunicata, also, in the structure of the nutritive system—the digestive apparatus, heart, gills, &c. But in the complexity of the muscular apparatus provided for giving motion to the valves, they much surpass the highest of the other Conchifera. There are not only several muscles provided for the closure of the shell, but another set to open it—an organization which no other Bivalves possess. The most peculiar part of their structure, and that from which they



Terebratula:
A, valve with the spiral arms: B, valve with arms removed

derive their name, consists in the presence of two very long arms or tentacula, between the origin of which the mouth is situated. These can be projected to a consi

durable distance from the shell, or drawn in and coiled up spirally within it. They do not appear, however, to seize upon prey; but rather, by means of the cilia with which they are fringed, to create currents which may bring food to the mouth. In the Terebratula, these arms are affixed at their bases to a very curious framework within the shell, the use of which is uncertain; but it is believed to aid, by its elasticity, in separating the valves from each other. This framework is most complex in the species in which the arms are shortest. The species of Brachiopoda at present known, live at great depths in the ocean; and many of their peculiarities seem to have reference to that particular condition. They are distributed through all latitudes.

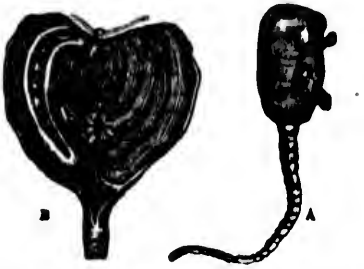
CLASS XVIII.—TUNICATA.

The lowest and simplest of the molluscous classes is that to which the name of Tunicata has been given, in order to mark the peculiar structure of the animals composing it. They bear a general resemblance to the animals which form bivalve shells, but are of inferior organisation. They are peculiarly distinguished from them, however, by the entire absence of any shelly envelope; and by the possession, instead of it, of a *tunic* or external coat, of greater firmness than the rest of the structure, which surrounds the whole body and affords it protection, besides being the medium of its attachment to the fixed substances upon which these animals usually rest. This external tunic is extremely variable in colour, consistence, and form. Sometimes it is dark, and of leathery toughness; sometimes even cartilaginous; and in many species it exudes a glutinous matter, by which particles of sand, gravel, comminuted shells, &c., are attached together, so as to form an additional envelope, which possesses great firmness. Sometimes, on the other hand, the whole body is extremely soft and delicate in its structure, and the tunic is a thin transparent membrane, the colour of which depends upon the intensity of the light transmitted through it.

The greater number of the animals of this class are attached, during the principal part of their existence, either to each other or to solid bodies. In a few species, a number of individuals are united by a stem which contains vessels establishing a connection among them all; so that they closely resemble the compound Polypifera. More commonly, however, the Tunicata live in societies, each individual being distinct from the rest, but a number adhering together to form one mass, which is often enclosed in a common envelope. In other instances, each animal is completely separate from the rest, although a number are found in the same locality. Where this is the case, the animals are severally fixed to rocks or other solid masses, either by the adhesion of the tunic itself, or by a sort of footstalk prolonged from it.

The *tunic* is always provided with two orifices; these are sometimes placed near each other, and are sometimes at the opposite extremities of the body. One of these orifices serves for the entrance of water into the cavity of the mantle, the other for its exit. The great bulk of the body may be considered as a respiratory chamber, that is, a cavity lined with a membrane upon which the blood is plentifully distributed, in order that it may be exposed to the action of the air contained in the water introduced into it. Accordingly, a continual current of water is maintained by the action of the *cilia* (minute, constantly vibrating, hair-like filaments) which clothe the lining membrane; and this current also serves to supply food to the inactive creature which produces it. The true mouth, or entrance to the canal that leads to the stomach, is situated at the bottom of the *branchial sac* or respiratory chamber; and part of the water introduced into the latter passes into the stomach, and after traversing the intestinal canal, and parting with whatever nutritive materials it contained, is ejected from the second orifice of the tunic, with the stream that has merely passed over the respiratory membrane.

In these actions nearly the whole life of the Tunicata appears to consist. Those which are adherent to rocks have no power of changing their place when once attached; and those which float in water, either singly or adherent to one another, seem to have no means of locomotion, except what they derive from the currents just described. The only other movement ordinarily noticed, is the contraction of the whole sac, which takes place when the animal is irritated in any way, the water contained in it being violently ejected.



Ascidia Australis: A, external aspect; B, internal structure.

The accompanying figure will give a general idea of the structure of one of these animals. On the right hand it is seen in its natural condition, with its attached footstalk; the two projections on the right side are short tubes terminating in the orifices by which water is introduced and expelled. On the left hand is shown the interior of the sac, which has been laid open; it is seen to be nearly empty, the intestinal canal on the left side occupying but a small proportion of the cavity; and the membrane lining it is disposed in folds, which are traversed by blood-vessels, so as to expose the greatest extent of surface to the action of the water, by the air contained in which the vital fluid is purified. The orifice by which the water enters this chamber is called the *branchial* aperture, because it leads chiefly for the admission of water to the *branchiæ* or gills; and that through which it passes out is called the *anal* or vent.

The division of this class into orders is not satisfactorily based upon the relative position of these orifices, which have a close relation with the whole life of two groups of animals. In the Ascidiæ, the two orifices approach more or less closely, and the body is either immediately fixed to some solid mass, or attached to it (as in the example just referred to) by a footstalk. In the Salpæ, on the other hand, the two orifices are situated at the opposite extremities of the body, which usually has an elongated form. They seldom attach themselves to fixed objects, but float freely amidst the waters. Without any special means of locomotion, they are continually changing their place, by means of the currents of water they produce; for, the fluid being drawn in at one end and expelled at the other, they advance in the direction to which the branchial orifice points. The Salpæ are usually of much more delicate structure than the Ascidiæ. Some of the more interesting species of each group will now be noticed.

Order I.—Ascidiæ.

Although some of the Ascidiæ present a nearer approach to the animals forming bivalve shells, than do any

of the Salpæ, it can scarcely be doubted that the group as a whole is inferior; and in it only do we find instances of that connection of several individuals by a common stalk, through which blood passes from one to the other, which indicates an approach to the Polypifera, especially to the order Ascidioida. In these compound Ascidiæ, a curious phenomenon is witnessed, which resembles the movement of fluid that will be described in one of the compound Polypes, the *Sertularia*. The stem which supports them contains two large vessels, which send off branches into the footstalks that support the several individuals. The branch from one trunk goes at once to the heart of each ascidia, which is but a simple bag, formed by a dilatation of the tube, having muscular walls; and that from the other is connected with the vessels which return from the intestinal tube and respiratory membrane, which are supplied with branches proceeding from the heart. The blood may be observed ascending for a time towards the heart through the first of these trunks, passing thence to the general structure, and returning to the footstalk by the second. But, after a short time, the current is reversed, and the blood ascends through what was before the returning trunk, and descends through the heart. In a short time, the flow is again reversed; and this change is repeated with great regularity, just as in the Sertularia. Although this alternation may be best observed in these compound Ascidiæ, in which the direction of the flow through the stem and branches may be clearly traced, there is reason to believe that it is common to the whole group of these curious animals.

Order II.—Salpæ.

The Salpæ are most abundant in tropical climates, and possess a greater delicacy of organization than the Ascidiæ, being generally almost or completely transparent. Most of the species belonging to this group are also remarkable for their luminous properties. In no species does there appear to exist such an internal connection as has been described in the lowest Ascidiæ; but scarcely any of them are entirely solitary. They generally associate together in masses of considerable extent, adhering either by their whole external surface, or by little projections from it, which seem formed for the purpose of attaching them to each other. Sometimes these masses assume the form of long bands, composed of salpæ adhering together side by side, all lying in the same direction. In others, again, the form of a star is presented, by an arrangement similar to that of the Botryllus. One of the most interesting of all, however, is the *Pyrosoma*, in which a number of these stars are piled, as it were, on one another, so as to form a cylindrical tube, which is closed at one end. The orifices of all the animals composing it are disposed in the same direction; so that water is constantly being drawn in on the exterior and expelled from the interior of the tube; as it can only pass out at one extremity, a current of sufficient force is produced to occasion the steady movement of the aggregate mass in the contrary direction. The luminosity of the Pyrosoma, the length of which varies from five to fourteen inches, is extremely vivid.

SUB-KINGDOM—RADIATA.

The general fact, that, in every complete natural group, there are some members which exhibit most plainly its characteristic peculiarities, whilst there are others in which these cannot be distinctly traced, or are altogether obscured, is nowhere more evident than when we compare together the different classes which are associated into this sub-kingdom. For whilst in some we find the *radiated* arrangement of parts almost invariably preserved, and, if left at all, only slightly departed from, we can only trace it indistinctly in others, and in others, again, it cannot be at all perceived. Thus, when we examine a Star-Fish, a Medusa, or a Sea-Anemone, we observe that they all have a circular form, that the mouth is in the centre of one of the surfaces, and that the several parts arranged round these are but repetitions of one another; and an internal examination would show the contained organs to have the same character. If from these we pass to certain other species of the same groups, we should find the external form slightly modified, being prolonged or shortened in one particular direction, and the disposition of the interior organs no longer radiated. Again, in the Sponges, all trace of a circular arrangement of parts disappears. Yet these, and other groups in which the radiated type is equally absent, must be associated with the classes more characteristic of it, on account of their general conformity of structure, and in some instances their very close alliance with them.

Moreover, in comparing the different forms of this group, we see exemplified another general principle, namely, that the *aberrant* members of it—those which depart most widely from its regular type—connect it with other groups. For, among the species in which the radiated arrangement is obscure, we find some that conduct us towards the Mollusca, and others that lead us to the Articulata; whilst in the Sponges and Corallines we have an evident approximation to the vegetable kingdom. So close, indeed, is this approximation, that there are many beings of which the true character is yet in doubt; they live, and grow, and multiply, very much in the manner of plants, and it cannot be ascertained with certainty whether the feeble motions they exhibit are to be regarded as spontaneous or not.

The great diversity, not only in form, but also in degree of organization, that exists amongst the Radiated classes, prevents much being stated of their general characters that shall be applicable to all of them. Thus, although the skeleton is external in some species, as the Sea-Urchin and Star-Fish, it is internal in others, as the Corals and some of the Jelly-Fish. Although most of them have a distinct mouth and stomach for the reception of aliment, others imbibe it, like plants, only by absorption through their exterior. Although some exhibit a high degree of sensibility, others are so apathetic as scarcely to manifest any feeling of injury when severely wounded.

The class Polypifera, containing the coral-forming animals, may perhaps be regarded as the most characteristic of the group. These animals usually associate themselves together into compound masses, of which every part is capable of existing independently of the rest, and each polype exhibits in itself the radiated structure, which cannot be detected in the entire mass; but all have a certain degree of connection with each other, which may be compared to that existing among the different buds of a tree. Even the species which do not form solid structures, such as the Sea-Anemone, remain almost constantly attached to the same spot.

The Acalephæ, commonly termed Sea-Nettles, or Jelly-Fish, have no such tendency to aggregation, and they never attach themselves to solid bodies, but wander at large through the ocean. By these characters, and by their extreme softness, these animals are readily distinguished.

The Echinodermata also live solitarily, and have the power of free movement, except in a few species which approach the Polypifera; but they are readily distinguished from the Acalephæ by the density of their texture, and especially by the roughness of the integument, which is usually beset with prickles or spines, as in the Star-Fish and Sea-Urchin.

In the two following classes, no distinctly radiated structure can be seen:

The Polygastrica, which are ordinarily known as Animalcules, are beings of extreme minuteness and gene

tal simplicity of structure. In the absence of distinct organs for the various purposes of the economy, they correspond with the lower Radiata, but they differ in the extreme activity of their movements. A separate division of the animal kingdom might almost be formed for them alone, so difficult is it to assign them any place in the ordinary scale. Some of them exhibit a tendency to associate into compound structures, like the Polypifera.

The Porifera, or *Sponge* tribe, are of all animals those which approach nearest to plants, in the absence of the characters peculiar to the kingdom in which they are placed, and in the want of definiteness of form. Certain movements exhibited by them, however, and their close affinity with some of the Polypifera, render it proper that they should be classed among animals.

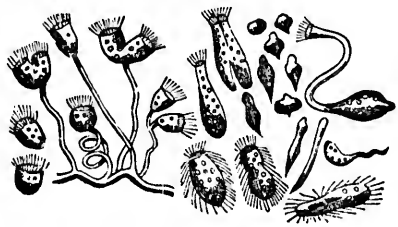
CLASS XIX.—POLYGASTRICA.

This class includes the greater part of those minute beings termed *Animalcules*, which have been, from the time of the discovery of the microscope, such fertile sources of wonder and delight, both to those who have themselves observed them, and to those who have heard from others of their marvels. Previously to that epoch, it was not suspected that beings existed of such minuteness as to be invisible to the eye, much less was any idea entertained of the extreme smallness of many species; and still more improbable and absurd would the statement have been deemed, that such beings are not of rare occurrence, but abound in every drop of stagnant water, and even exist in the whole mass of the ocean. Yet such has been shown to be the fact, and every improvement in the powers of the microscope has enlarged our ideas of the extent of animal life in the fluids of the globe; so that the philosopher is now ready to admit no limit to the possible minuteness of living beings, but looks to still further improvements in the microscope as a means of extending his acquaintance with them, and not as likely to set any bound to his inquiries.

Animalcules may be obtained without difficulty for microscopic examination during the warmer part of the year, by skimming the surface of ponds, especially those in which the water exhibits a red or green tinge, or in which it is covered with duckweed, or with the slimy film which may often be noticed. Many curious species frequent these situations; but the commoner ones may be obtained with even less difficulty, by placing soft vegetable matter, of almost any description, in vessels with water, and exposing the mixture to the sun and air for a few days. As soon as decomposition begins actively to take place, Animalcules may be detected in the fluid, and in a short time they often crowd it most densely. These are generally at first of a simple kind; but new species soon prevail, and those first seen disappear. Different kinds of vegetable matter seem to favour the development of the different species; and there are some Animalcules that can be produced in no other way than from an infusion of some particular substance. Asparagus stems that have been boiled will favour the production of Animalcules, with perhaps as much readiness as any vegetable matter; hay, chopped straw, the leaves of plants, and other common ingredients, may also be advantageously employed.

In the class Polygastrica are included all the most minute species of true Animalcules, and some among the larger ones; but as a whole, the beings composing it are smaller than the Rotifera, and far smaller than those of any other class. The largest among them are but with difficulty seen by the naked eye, and of the dimensions of the smallest the mind can scarcely form an adequate conception, although they may be numerically stated. The class takes its name from the belief entertained by the celebrated Prussian naturalist, Ehrenberg (who has devoted almost his whole life to the study of the microscopic forms of existence), that the animals composing it may be characterized by the possession of many distinct stomachs or digestive sacs. There is some doubt upon this question, however; that which can actually be seen will be presently stated; and it will be preferable to enter no further into the question in this place.

The bodies of these Animalcules are of very soft consistence, and very transparent; so that they resemble flakes of very thin jelly. Their forms are extremely variable; and, in some species, the same individual at different times alters its shape so completely, that it could scarcely be recognised. Indeed, many mistakes have occurred from this cause. The softness of the tissues of the Polygastrica is also seen when, in swimming, they encounter an obstacle, there seems scarcely any limit to the change of form to which many will submit, in order to pass the obstruction. They are not all so flexible, however; for in some species the body is enclosed in a siliceous sheath of very great delicacy, which gives support and protection to the still more delicate structures it contains. It is the accumulation of such sheaths that has given rise to the collections of Fossil Infusoria (as they have been termed), which will be hereafter noticed. Sometimes the whole body is contained within the sheath; whilst in other instances a sort of trunk or foot may be projected from its opening.



Various forms of Animalcules.

The bodies of the Polygastrica are usually fringed with cilia, by the vibrations of which they are assisted in their own movements, and also in the acquirement of their food. Sometimes these cilia are disposed along the whole extent of the edges of the body; in other instances they surround the mouth only, and from that part they are seldom absent.

For some time after the discovery of the Infusoria, it was supposed that they must obtain their nutriment by absorption through the substance of their bodies, for no mouth, stomach, or alimentary tube could then be discerned. But, by placing them in water, through which very small particles of colouring matter (such as indigo or carmine) were diffused, it was perceived that these particles are introduced into the interior of the body, and are collected in cavities hollowed from the general mass. And, subsequently, the improved powers of the microscope have enabled an entrance to the interior of the body or mouth to be discovered in almost every instance, and a second orifice in a considerable number of species. The mouth is commonly furnished with a border of cilia, and sometimes with a set of projecting bristle-like teeth, which are used in laying hold of smaller Animalcules, on which the possessor of this apparatus feeds. The introduction of food into the cavity of the body in those species which are destitute of this appendage, may be best watched by diffusing colouring particles through the water in which the Animalcules are swimming. They are seen to be drawn into the mouth by the vortex or whirlpool occasioned by the action of the cilia; and soon after entering it, they are observed to be united together into little round balls, as if they had been compressed in a small spherical cavity. These balls are sent one after

the other into the general cavity of the body, where they seem to lie in the midst of a soft gelatinous pulp, and in which they perform a slow revolution—the foremost ones escaping at intervals from the second orifice, whilst new ones are being pushed in from the mouth behind.

This is all that can as yet be certainly stated in regard to the digestive apparatus of the Polygastrica; since the opinion of Ehrenberg, that the whole body is occupied by a series of small distinct globular cavities or stomachs, connected by an intestinal tube, is not adopted by other naturalists. Nothing will therefore be said of his classification of these Animalcules, which is principally based upon characters furnished (according to his idea) by the arrangement of the stomachs.

The largest species of the Polygastrica probably never exceed 1-20th of an inch in length; the smallest at present known are about 1-2000th of a *line* in diameter; but there is no reason to suppose that this is by any means the limit of minuteness. They usually multiply by spontaneous division, the body of the parent splitting into two or more parts, each of which soon becomes a perfect being, capable of going through the same process. From observations which have been made upon the species in which these changes are most rapidly effected, it has been calculated that, under the most favourable circumstances as to food, temperature, &c., a hundred and forty million millions may be produced in four days—a degree of fertility which assists in explaining the almost universal diffusion of these Animalcules, and their sudden appearance in countless swarms.

Our ideas of the vast amount of animal life existing in this class have lately received a considerable extension by the discovery that their remains, minute as they are, not unfrequently accumulate into masses of great extent. It is only of those species in which the bodies are covered with an envelope containing earthy matter, that the remains can be thus preserved; and the substance formed by their aggregation seems to be an impalpable powder, such is the minuteness of each particle.* Such substances have long been known under various names. One is the Tripoli, or Rottenstone, used in the arts for polishing metals. Another is the siliceous meal which has been used in Sweden, on account of its supposed

Fossil Remains of Animalcules, forming Tripoli.

nutritious qualities, mixed in bread with flour and the inner bark of trees, in times of scarcity. Both these, as well as many other substances, consist entirely of the siliceous shields or envelopes of Animalcules, closely allied to, if not identical with, species at present existing; and the quantity of animal matter which is dried up in the latter, and which may be determined by the effect of heat (this dissipating the animal portion and leaving the siliceous particles unchanged), is sufficient to account for its nutritious properties.

* Of the larger species more than 190 millions are estimated to weigh only a grain.

CLASS XX.—ECHINODERMATA.

The class of Echinodermata, comprehending those well-known animals, the *Asterias* (Star-Fish), and *Echinus* (Sea-Urchin), takes its name from the prickly skin with which most of the tribes it includes are provided. But this is not an universal character; for some of the species which border upon other groups, have a skin destitute of any appearance of spines. There is a little difficulty, however, in distinguishing the animals of this class from all others, for in nearly the whole of them the radiated structure, or the arrangement of parts in a circular form, is very evident; and they are the only animals among the Radiata which have the power of moving from place to place, and have at the same time an integument firm enough to resist pressure.

Although the character and degree of organization in the different subdivisions of this class may be regarded as about the same, the form of the organs, and the mode in which they are arranged, are very different, so that it will be better to describe each group separately. The class may be distributed into three orders; the Stellerida, including the Star-Fish and their allies; the Echinida, including the Echinus and its allies; and the Holothurida, a group less commonly known, and differing much from the others.

Order I.—Stellerida.

The common *Asterias*, or Star-Fish, which may be taken as a type of the order Stellerida, is covered with a tough leathery skin, beset with prickles. The animal has the form of a star, with five or more rays springing from a central disc. In the middle of one side of the disc is situated the mouth, and this side, according to the usual habits of the animal, must be considered the lower one. The mouth opens into a globular stomach, which sends out prolongations into the several rays, but there is no intestine in this animal, nor any second orifice to the digestive cavity, so that the indigestible parts are rejected by the mouth, as in the Sea-Anemone.

Asterias: upper surface.

If the tough prickly skin be removed, it is seen that it is supported by a series of bony plates, beautifully jointed together. Along the under side of each ray, the plates exhibit a series of perforations, through which there issue, in the living state, a large number of minute tubes, which may be occasionally seen projecting on the outside. These tubes are termed the *feet*, on account of the use to which they are subservient. Every one of them is connected, on the interior of the shell, with a small vesicle or bag, which is capable of being distended with water by a system of vessels adapted to the purpose, and of contracting so as to force its contents into the tube. The tube consists of a delicate elastic membrane, covered with two layers of muscular fibres, the one circular, the other longitudinal, and furnished with sucker at its extremity. When distended with water, the tube projects from the body; and, if the sucker be then applied to any movable substance, it will be drawn towards the body by the elasticity of the membrane, when the distending force is relaxed. Although each sucker is small and weak, the combined efforts of many give the animal considerable power, not only of drawing prey towards the mouth, but of moving its own body from place to place.

The order Stellerida includes a large number of forms, having a general resemblance to the *Star-Fish*, but differing much in the relative proportion of the body and rays. Thus, in some species, the arms seem to make up the entire animal, no central disc being present, save that formed by their union. In others, the arms appear simply appendages to the central disc, to which the stomach and other important organs are confined. In some instances, the arms send off lateral appendages; and these occasionally again subdivide, so that a branch-like structure is produced, such as we find in the *Comatula*.

A very remarkable tribe, included among the Stelle-

rids—once a group very important in its numbers, and in the extent of its diffusion through the sea, but now presenting only two or three comparatively small species—is that known under the name of *Crinoidea*, or lily-like animals. These are formed much upon the plan of the Comatula, but they are attached by a jointed stalk to solid substances, usually to the bottom of the sea. They thus remind us of the Polypifera, which they seem to connect with the Echinodermata. This group contains two principal subdivisions—the *Encrinites* and the *Pentacrinites*. The former are distinguished by the roundness of their stems, the joints of which being flat and perforated in the centre, are known under the name of wheel-stones, or St. Cuthbert's beads. The latter have pentagonal stems. The former seem to have been the most ancient.

Order II.—Echinida.

In the Echinida we find the body usually of a somewhat globular shape, and enveloped in a firm shell, composed of a very regular series of plates jointed together. In the Echinus, the shell of which is commonly known as the Sea-Egg, we observe two orifices situated at the poles, as it were, of the globe. The larger of these orifices is the mouth: at the smaller one the intestinal tube terminates. The mouth, as in the star-fish, is generally directed downwards. It is furnished with a very curious apparatus of teeth, which are worked by powerful muscles, attached to projections of the shell, that may be seen on the inner margin of the mouth; and their points can even be protruded beyond the mouth, so as to lay hold of prey brought to them by the long tubular feet. By the action of the teeth, the food is ground down before it passes into the intestinal tube, which is here of considerable length, and takes a couple of turns round the shell before its terminntion. Round the second orifice of the shell are disposed the ovaria, which are very largely distended with eggs at some seasons, and are eaten under the name of *the roe of the sea-egg*.

It is the exterior organization of these animals, however, that presents us with the greatest sources of interest. On looking at the Echinida in their living state, we see that most of them are covered with spines of considerable size, instead of with such small prickles as the Asterias bears. Moreover, these spines are seen to be movable at their bases, and their power of motion is due to their peculiar connection with the shell. Each spine is spread, at its root, into a cuplike form, and the hollow of this cup fits upon a little knob or tubercle projecting from the surface of the shell, so that a complete ball-and-socket joint is formed. The spines are connected to each other, and held on the shell by the skin which covers the latter, and which is attached around their roots; and it is by the contractions of this skin that they are moved.

On looking at the exterior of the shell of an *Echinus*, it is seen that the tubercles are arranged with great regularity, and that the larger ones are confined to particular rows of plates, which are hence called *tubercular* plates. Between these are smaller plates, commonly bearing smaller tubercles, and perforated with a number of minute holes, for the passage of the tubular feet; these are called *ambulacral* plates. The tubular feet, like the spines, are much longer than in the star-fish. They are always capable of being projected beyond the spines; and, taking an attachment by the suckers at their extremities, they can cause the shell to roll, as it were, upon the points of these. In some species, the spines are five or six inches long, whilst the diameter of the body is much less. The tubular feet often escape notice on account of their transparency; and the animal appears to be walking upon its spines, when it is merely resting upon them as fulcra, and drawing itself forwards by these curious organs. It is to be remembered that the body will weigh much less in water than in air, and thus may be supported upon spines of great delicacy.

Shell of Echinus; *a*, tubercular plates; *b*, ambulacral plates.

The structure of the shell itself, and the mode of its increase, are not among the least interesting parts of the history of this animal. The shell is composed, as already stated, of a large number of plates disposed with great regularity, and accurately fitted together. These plates are usually of an hexagonal shape, but where large and small ones join, there is of course some modification. Now, it is obvious that a shell of globular form can only be regularly increased in all its dimensions by the equal growth of every part of it. This addition is provided for by the interposition of a thin layer of membrane, from which the shelly substance may be deposited between the edges of all the plates; and this membrane also answers the purpose of forming a connection between the skin covering the shell and the organs of nutrition within.

These animals are generally found on sandy shores, and especially in little nooks secluded from the direct influence of the waves. Some of them excavate hollows in the sand by means of their spines, and one species even works its way into solid rock. Their food is of a mixed quality. Fragments of shells, Crustacea, and other marine animal products, are found in their stomachs, as well as portions of sea-weed. They obtain their prey whilst lurking in their hollows, by allowing their tubular feet to play loosely in the water around; and when any small animal touches the sucker at the end of one of them, it is soon secured by the assistance of others, and drawn within the range of the powerful teeth.

It is not in every species of Echinida that the globular form is so well marked as in the Sea-Egg. There are many in which the shell is more or less flattened, and in which one or both the apertures of the alimentary canal are out of the centre. In these the dental apparatus is either absent or comparatively feeble.

Order III.—Holothurida.

In the last order of Echinodermata, the Holothurida, we find the characters of the class remarkably blended with those of Articulated animals. The body is not enveloped in a hard shell, but in an elastic skin, destitute of spines or prickles. It retains, in some species, the globular form, but in many it is very much prolonged, so as to be almost cylindrical, and thus to resemble that of the Worm tribes; and it is occasionally even marked by transverse bands, indicating a division into segments. Still, however, a distinctly radiated conformation may be seen around the mouth; and some of these animals look as if a star-fish were set as a head on the body of a large worm. In the general conformation of the internal organs they correspond with the Echinida; but they are in some respects more complex, and the respiratory organs are constructed upon the plan of those of the Articulata. They thus form a very interesting link of connection between the Radiated and Articulated subkingdoms.

The skin of most of the Holothurida is so very elastic that they can change their size and form in a remarkable degree. They are capable, too, of swimming with considerable rapidity, and some of them crawl like slugs upon solid surfaces. Small species are occasionally found in British seas; but on some tropical shores they are very abundant, and grow to the length of eighteen or twenty inches. They are sometimes eaten by the poor on the Neapolitan coast; but in the Malay archi-

pelago they are regularly sought, and conveyed to the Chinese market, where, under the name of *trepang*, they fetch a high price.

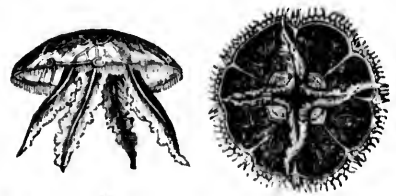
CLASS XXI.—ACALEPHÆ.

The name of the class next to be described, the Acalephæ, is derived from the stinging power possessed by nearly all the animals composing it. The word is the Greek term for *nettles;* and by the designations *sea-nettles, stung-fishes*, &c., these animals are popularly known; as well as by another, also expressive of a character by which the group is distinguished—*jelly-fish*. It is rather difficult to give any description of the structure of the class that shall include all the members of it, so much do they vary among each other. They all differ from the Polypifera in being unattached to solid bodies, and in having the power of freely moving through the sea; and they differ from the Echinodermata in not being covered with a dense integument. Their extreme softness is one of their most remarkable characters. Some of them attain considerable size, yet with an almost entire absence of any hard support or framework; indeed, it is only in a few species that any such exists.

The tissues of the Acalephæ are so soft, that they seem almost like masses of jelly; whence originated their common name. They consist of a sort of network of animal filaments, the interspaces between which are filled up with water; and so large a proportion does this bear, that it drains away when the animal is kept out of its element for a short time, leaving but a thin film of membrane behind it.

The arrangement of the mouth, stomach, and other organs, is subject to great variation in the different subdivisions of this class, and we here encounter the very remarkable fact, of the existence of animals of complex structure and varied powers, which do not possess any regular mouth, but imbibe their food like plants by root-like filaments. Owing to the difficulty of examining the structure of beings which can be so imperfectly preserved, however, the organization of many of the more curious species is as yet very imperfectly understood, and it will be better to confine ourselves here to the consideration of those most certainly known.

One of the commonest forms of this class is the *Medusa*, which is often seen floating in vast numbers on calm sunny days at a little distance from the shore. The animal consists of a large umbrella-shaped disc, from the under surface of which hang down four broad and long tentacula. Both disc and tentacula exhibit a very beautiful assemblage of colours, like those of the rainbow, when the rays of the sun are reflected from their surface. On the under side of the disc is seen the mouth, situated in the centre, and surrounded by the origins of the tentacula. This is the entrance to a stomach, which lies in the middle of the disc, and is surrounded by four ovarial chambers,



B A

Medusa: A, under surface, showing the mouth in the centre, surrounded by the tentacula, and the ovarial chambers exterior to the origins of these; B, side view, showing the tentacula hanging down in their natural position.

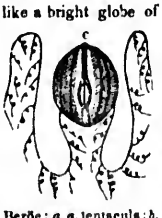
having separate external orifices. The animal may be compared, in some degree, to a Sea-Anemone detached from its base, and swimming with its mouth downwards. The membrane of the disc extends much beyond the stomach and ovarial chambers (which may be described as occupying the part corresponding to that included between the metallic stretchers of the umbrella), and this broad free margin is endowed with muscular powers, and performs a series of regular undulations, by which the animal is propelled through the water.

The extreme softness of the tissues of these *Medusæ* is an obvious reason why they should not expose themselves to the rough surface of the ocean, where they would be beaten to pieces by the waves—or to the proximity of the shore, from which they would soon receive fatal injury. Although so soft, however, they have the power of mastering prey of much firmer structure, and hard Crustacea, as well as other marine animals of high organization, supply them with food.

The *Medusa* shares in another property possessed by most of the class, that of luminosity or phosphorescence. It is chiefly to the smaller tribes, accumulating in immense numbers, and so transparent as to escape notice by day, that the occasional phosphorescence of the sea is due. This very beautiful phenomenon may be seen not unfrequently on the shores of Britain; but it is most splendid in warmer seas, especially in the Mediterranean. In the midst of the diffused luminosity, caused by the glow of innumerable multitudes of small Acalephæ, and even of animalcules far smaller, the larger ones shine out like stars in the milky-way. The cause of this beautiful appearance is ill understood. It has been ascertained to exist in a secretion formed from the surface, which can be washed off, and can thus communicate the phosphorescence to various fluids, in which it seems to remain until decomposition has taken place. The light is rendered more brilliant, when exhibited by the animal itself, by any thing which irritates it; and this fact is observed in the case of most luminous animals.

An interesting species, allied in general form to the Medusa, but differing from it in a remarkable particular, is the *Rhizostoma* (root-mouth). No mouth is seen in the centre of the inferior side of the disc, but the stomach sends canals into the substance of the tentacula, which terminate in a number of minute pores at the extremity of those organs. By these small pores, as by the roots of plants, nourishment is absorbed into the system, for the ends of the tentacula fix themselves like suckers upon the surface of the animal they have grasped, and imbibe its juices. These and other Acalephæ which move through the water by the undulations of their membranous disc, are included in the order PULMONIGRADÆ. All the Acalephæ of this order exhibit a very regular disposition of their parts around a centre, so as to be truly *radiated* animals. Some of them attain a diameter of two or three feet.

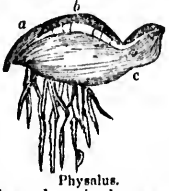
Another interesting species of this class is the *Beröe pileus*, a small animal not unfrequently found on the coast of Scotland. When at rest in the water, it looks like a bright globe of jelly, about half an inch in diameter. An opening is seen at each pole of the globe; one of these is the mouth, and at the other the alimentary canal, which runs straight across the body, terminates. Its surface is marked by eight bands, running, as it were, from pole to pole; these bands seem to be of firmer texture than the rest of the body, and on them are placed the rows of cilia, which can act either together or separately, so as to give every possible variety of motion to the body. Hence this animal, and others resembling it, are said to belong to the order *Ciliograda*. The Beröe usually swims, by means



Beröe: *a, a*, tentacula: *b*, mouth; *c*, termination of intestine.

of them, mouth forwards, through the water, and thus a current of water is driven into the stomach, without any further effort on the part of the animal. But it is provided with other means of obtaining its food, in two long tentacula, which arise from the posterior part of the body, and are furnished with a number of lateral filaments; these can all be withdrawn and folded into two cavities, excavated, as it were, in the substance of the body, and are easily unrolled when required for use.

A very common form of this class in some climates is the *Physalus*, known to sailors as the Portuguese Man-of-War. This is distinguished by its large air-bag, surmounted by a vertical membrane or crest, which usually floats above the surface of the water, and is acted upon by the gentle breeze, in the same manner as the little sail of the Velella. The animal organs placed below are very obscure in their character. No distinct stomach can be perceived; but the tentacula are dilated at their roots into chambers, of which each may perhaps be regarded as a digestive cavity. Some of the tentacula are very long, and hang down in the water to the depth of fifteen or twenty feet when the animal is floating. They possess considerable stinging power, and probably serve to entrap the food upon which the shorter tentacula, with their sucker-like extremities, then affix themselves, for the purpose of taking up nutriment by absorption. These Acalephæ have been termed *hydrostatic*, from the power they possess of rising or falling in water, by increasing or diminishing the bulk of the air-bag; but by what means they effect this change is not known. In some species comprehended with the *Physalus*, in the order Physograda, several small air-bags exist, instead of a single large one. These are usually fixed to the same stalk, like currants upon their stem, and this rises out of the apparatus of tentacula, &c., of which the animal may be said really to consist.



Physalus.

The Acalephæ inhabit all climates, but the larger forms are to be seen in tropical seas.

CLASS XXII.—POLYPIFERA.

The animal character of the beings composing the class Polypifera was formerly doubted, as that of the Sponges is at present. The structures which they form, known as Corals, Coralines, &c., have often so much of the plant-like aspect, and sometimes also of an apparently woody structure, that, even in recent times, naturalists have been deceived into a belief in their vegetable nature.

Another popular error in regard to this group, is the attributing the formation of coral to *insects*, and the supposition that it is their habitation, constructed under the same circumstances as the comb of Bees, or the pyramids of the Termites. Now, the real fact is, that the masses of *coral, madrepore*, &c., as well as the *sea-fans* and other similar structures, with many smaller and more delicate ones, of which some are ranked among the *sea-weeds*, and others commonly known as *corallines*, are the *skeletons* of the animals by which they are produced, and are to be regarded as parts of the living structure, so long as the flesh which clothes or lines them retains its vitality.

If, for example, the stem of the common *red coral* be examined when clothed with its living flesh, its surface is seen to be scattered over with polypes, the structure of each of which bears some resemblance to that of the sea-anemone; but these, so far from being independent of one another, like so many sea-anemones attached to the same rock, are connected by a system of vessels which traverse the flesh, and bring them all into communication. Nevertheless, any one of these would live if detached from the rest, and would gradually produce others, until a new structure is formed, similar to that of which it was a part. Moreover, if a piece of the gelatinous flesh be stripped from the stem, *this* will be competent to form both new polypes and a new skeleton.

Such compound beings, then, of which the polypes only form a part (like the leaves or flowers of plants), are not improperly termed Polypifera or Polype-bearing Animals. But there are many kinds of Polypes, which have no tendency to this kind of aggregation, and which are never found but in a solitary state. Such are the *Sea-Anemones*, and the *Hydra* or fresh-water Polypes. And various degrees of intimacy of connection between the polypes of compound structures may be traced in different species; some of these will be hereafter noticed.

The class may be divided into four orders, characterized by four distinct types of structure: in each of these we shall find polypes existing almost or altogether independently of one another; and species closely allied to these, in which they are intimately associated. As the distinguishing characters of these orders cannot be understood without a knowledge of the structure of the polypes belonging to each, it will be better to proceed at once to the description of them, the amount of popular information on the subject being small. We shall begin with the one generally accounted the simplest.

Order I.—Hydroida.

The *Hydra*, or fresh-water Polype, is a minute animal, often found in great abundance, clustering round aquatic plants in stagnant pools. It seems to consist only of a kind of bag, constituting its stomach, round the mouth of which is disposed a circle of long arms or *tentacula*, whilst the opposite end is prolonged into a foot, terminated by a kind of sucker, to which the animal attaches itself. The changes of form in this polype are very remarkable. The body has sometimes the shape of a long cylinder, whilst at others it is contracted into a sphere, the arms having shrunk alike into small projections around the mouth. This appearance is generally presented when the stomach is replete with food.


Hydra.

The *Hydra* is an extremely voracious animal; and, although little able to move from place to place, it secures an abundant supply of food by its long arms, which serve as so many fishing-lines. When any aquatic worm or insect touches one of them, it is entrapped by it, and other arms are speedily brought to its assistance; so that, by the simultaneous contraction of the whole, the prey is conveyed to the mouth, even if strong enough to make powerful resistance. Not unfrequently it can be seen to move about violently within the stomach for some little time; but the powerful digestive secretion speedily begins to act upon it, and its soft parts are dissolved, the hard ones being usually ejected by the mouth. When this solution has been performed, the fluid which results from it is seen to be distributed by a kind of circulation through the walls of the stomach and the arms.

Nothing in the history of the Hydra is so remarkable as its power of being multiplied by division, and of repairing the effects of other rough treatment. In regard to this, there really seems no limit. Not only can the body reproduce the arms, the mouth re-form the tail, and the tail the mouth; but, from a minute fragment, the perfect Hydra is reproduced, so that an individual cut up into forty or fifty pieces, will be converted into as many separate polypes. Two bodies, also, may be grafted together by the side, the tail, or in any other way; and

monsters with two heads, two tails, &c., may be easily produced. It was, in fact, on account of this tenacity of life and tendency to reproduction as a consequence of injury, that the name Hydra (after the fabulous monster of ancient times) was given to this little creature when first discovered about a century ago. The power of any one part to perform the functions of the rest, is remarkably shown by the fact, that the polype may be turned inside-out; so that what was before the lining of the stomach becomes the external integument, and *vice versa*, without its comfort being perceptibly impaired.

The Hydra is not known to subdivide spontaneously, however, but it propagates itself by a process resembling the budding of plants. A little knob first projects from the side of its body, this enlarges, and from the top of it are seen to spring a number of small processes, which are the arms. In the centre of these an opening appears, constituting the mouth of the young polype, which gradually assumes the form of its parent, and begins to catch prey for itself. Still, however, the cavity of its stomach communicates with that from which it was at first prolonged; but the passage is gradually narrowed, and at last obliterated. When quite independent, the young polype detaches itself from the parent, and has no further relation with it. Several of these buds may spring from the same polype at once, provided it be well supplied with food, and the temperature be warm; and a second generation may even show themselves upon the first, whilst still continuous with the parent structure.

The entire substance of the Hydra is soft, and no part seems possessed of greater firmness than the rest. In some other species, however, we find a tendency to the consolidation of the exterior into a kind of horny tube or sheath; and when a number of polypes are associated together, a compound structure is thus produced. In these compound structures the cells are connected by stems and branches, in the same manner as the buds of a plant, and through the base of each cell there is a canal lined by an extension of the lining membrane of the polype, and uniting with the channels which pass through the whole structure. Thus, all the polypes are brought into connection with each other, and with the general mass or polypary.

Portion of Sertularia: *a*, *a*, polype-cells withpolypes; *b*, *b*, ovaral vesicles.

These polyparies, formed by the association of hydraform polypes, are among the most graceful and elegant of all the structures with which this class presents us. They are of minute size when compared with the massive productions of other tribes; and the uniform absence of stony deposit gives them a degree of flexibility which adds much to their gracefulness. There are few shores on which some forms of them may not be picked up. They are commonly mistaken for seaweeds.

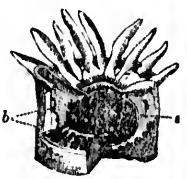
The polypes, being enclosed in cells, do not share in the function of reproduction, for which a special apparatus is evolved. A set of horny vesicles (*b*, *b*), usually much larger than the polype-cells, are developed at intervals from particular parts of the stem and branches; and it is in these that the reproductive bodies or gemmules are formed. Each vesicle is provided with a lid, which falls off when the gemmules are mature and ready to swim forth; and the vesicle itself afterwards shrivels and drops away, like the seed-vessel of a plant that has shed its seeds. The whole of this process very much resembles the fructification of mosses, in the mode in which it is carried into effect.

The forms of Polypifera allied in structure to the Hydra, compose an order which may be termed that of HYDROIDA, or *Hydraform* Polypes. This order is pretty uniformly distributed over the globe; not abounding more in tropical than in temperate regions. Scarcely any fossil remains of it are to be found.

Order II.—Hetiantho.da.

A common form of polype, apparently so different from the Hydra that the relationship between them would not have been suspected by an uninformed observer, is the *Actinia* or Sea-Anemone. There are probably no shores over the whole globe, except the very coldest, on which some species of this interesting creature are not to be found. The mouth is in the centre of the upper surface, and is surrounded by tentacula; and these are numerous and arranged in several rows. The under side forms a large sucker or disc; by this a very firm hold is taken of the rock or other surface to which the animal adheres. The stomach does not occupy the whole cavity of the body, by only the central portion; and the space between its wall and the outer integument is divided, by vertical membranous partitions passing directly from one to the other, into a number of radiating chambers, in which the germs of young *Actiniæ* are produced, and sometimes nearly matured. The tentacula are hollow, and their cavity is continuous with that of these chambers; at the extremity of each is a small aperture, through which water is occasionally taken in, and then ejected with considerable force. This process seems to be of the nature of the action of respiration in higher animals.


Actinia seen from above.



Section of Actinia; *a*, cavity of stomach; *b*, surrounding chambers.

The tentacula of the Sea Anemone can be contracted in the same manner as those of the hydra, and they are furnished with a sort of sucker at their extremities, by which they can draw towards the mouth any substance which comes in contact with them. Although each seems weak in itself, the combined action of many is sufficiently effectual for maintaining an ample supply of food. These animals are extremely voracious. Not being able to move from place to place in search of particular kinds of nutriment, they are adapted to digest almost any which comes within their reach. Shell-fish and small Crustacea appear to be their usual diet. These are swallowed alive, in spite of their struggles, but are soon destroyed by the powerful solvent action of the juices of the stomach. The hard portions are ejected from the mouth; and, in getting rid of them from its stomach, the Actinia often inverts the lining of the latter through its entrance, so as almost to turn its body inside out.

The powers enjoyed by the Actinia of reproducing different parts which have been removed, and of multiplication by the division of its body, are nearly as great as those already described in the hydra. It may be divided either vertically or transversely, and each part will in time supply what was deficient, and become an entire animal. This reproduction has taken place in

some instances from small fragments, but it does not appear that the same number can be reproduced by the subdivision of one, as in the hydra. We do not find here the same process of multiplication by buds, as in the hydra; but distinct germs, or *ova*, are formed in the radiating chambers which surround the stomach (hence called *ovarial* chambers), and from these, as from the eggs of higher animals, new beings like the parent are produced. The development of them may take place whilst yet within the body of the parent; and thus, as the young ones pass out from the mouth, it appears to cast them up from its stomach.

The sea-anemone is not the only solitary polype possessing the kind of structure which has just been described. Several other species exist, in which the same type is presented with various modifications.

There are some among them which form a stony deposit in the substance of their base, and in the membranous partitions between the radiating chambers. Of these one small species inhabits the British seas; it belongs to the genus *Caryophyllia*. A very beautiful corallino formation of this description is that produced by the *Fungia*, an animal allied to the sea-anemone, and inhabiting only tropical seas. It consists of a thick round plate, sometimes several inches in diameter, from one surface of which arise thin vertical plates, radiating very regularly from the centre to the circumference. This is, in fact, a single cell of a large solitary polype, and from it the structure of other corallino masses will be understood.

The cells of such solitary polypes are not always round, but are sometimes very much prolonged in one direction, so that the depression in the centre, marking the place of the mouth, towards which all the radiating plates are directed, becomes a long groove. These stony masses contain a considerable quantity of animal matter, by which the particles of carbonate of lime are glued together; and when a sufficiently fresh specimen of a stony coral is submitted to the action of an acid which dissolves these, the animal substance will retain its form

Mass of Astræa Viridis:
a, a, expanded polypes; b, b, polypes withdrawn into their cells; c, stony mass uncovered by flesh.

The number of stony corals formed by the compound Polypifera is very great; and, of the more massive kinds, a large proportion belongs to this order. Those which are to be ranked as the skeletons of animals allied in structure to the sea-anemone, are distinguished by a character very easily recognised. In each cell, however minute it may be, the arrangement of radiating plates, described in the *Fungia*, is seen; and from the presence of these thin plates, or *lamellæ*, the whole of this group of corals and madrepores have been designated as *lamelliform*. A lamelliform coral is, then, always formed by a polype similar to the sea-anemone (or *actiniform*); and thus, by attending to the mode in which the growth of the coral depends upon the structure of the animal, we obtain a valuable character, on which we can always rely.

The individual polypes belonging to such structures are connected by a gelatinous flesh enveloping the whole, which seems to answer to the membranous pith lining the stems of the compound Hydroida. It is by this flesh, rather than by the polypes themselves, that much of the stony mass is deposited, as may be seen by examining many species in which the intervals between the cells are considerable. The variety of aspect which these masses present is very great, but there is little difference, so far as is known, in the structure and habits of the individual polypes, which form part of the beings in their living state.

None but *stony* corals are formed by Polypifera of this order; but there are many of that description which do not belong to it, of which we shall hereafter speak. However, it is to this order that the greater part of those species belong which are concerned in erecting the massive structures known at present under the names of coral reefs and islands, as well as those which appear to have existed in still greater amount in former epochs of the earth's history, and to have given origin to the greater part of the limestone rocks which constitute so large a proportion of the crust known to us. This order may be denominated that of *Actiniform* Polypes, from the general resemblance of the animals composing it to the sea-anemone; or *Helianthoida*, from their similarity in aspect, when expanded, to the sun-flower.

Order III.—Asteroida.

The next order of Polypifera is one which brings us nearly to the form of the Sponge. In the compound groups we have been last considering, the polypes form an important part of the general structure, and in some instances each may be regarded as existing almost for itself alone, even where many are united by the connecting fleshy matter. But in the group to be next treated of, the polypes seem quite subordinate, and the general mass seems to have (as in the sponge) much more of the character of a single individual. In these structures we observe, too, that the hard basis or skeleton is seldom so distinct from the living tissue as in the lamelliform corals, the two often passing into each other by almost insensible gradations. The density of the skeleton varies considerably in the different species. Sometimes it is of a spongy character, as in the *Alcyonia*; sometimes of a stiff horny texture, as in the *Gorgonia*, or Sea-Fan; and sometimes of a stony hardness, as in the Red Coral.

The *Alcyonia* are found abundantly on many parts

Alcyonium:
A, portion enlarged, showing the polypes.

of the British shores, and are known to fishermen by the names of *dead-man's-hand*, *sea-fingers*, *sea-paps*, &c., from their flabby texture, and the peculiar forms they present. Their structure is spongy but they have

usually a more distinct envelope than the true Sponges, and this has sometimes a leathery character. Their interior is traversed by a series of canals, which ramify and inosculate with each other; and, on cutting into the mass, it is observed that nearly the whole tissue is composed of a network of these passages, separated by the animal fibrous tissue, which is sometimes condensed into a fabric of considerable firmness. The large canals have no direct external opening, however, but they terminate in prominences of the spongy mass, from which the polypes protrude.

The polypes themselves have some resemblance to to the sea-anemone, but they are usually much smaller and of more delicate structure. There are, however, some important differences, upon which the character of the order is founded. The tentacula, instead of being numerous, and arranged in several rows, are only eight in number, and form one circle. They are broad, and almost leaf-like, instead of being round and slender. The mouth is situated in the midst of them, and leads to the stomach, which occupies the centre of the body; around the stomach are the *ovarial chambers*, separated by radiating partitions, but only eight in number. The stomach opens into the canal upon the end of which the polype is placed, and all the fluid which enters the mass appears to be taken in through these mouths. The ovarial chambers also communicate with the canal beneath, indeed they may be said to be a continuation of it, for the partitions between them are prolonged downwards into the canal, forming plaits or folds of its lining membrane, in which the ova or germs are developed; so that these are produced from the general mass rather than from the polype, and the whole structure may be regarded as a higher kind of Sponge.

The polypes are capable of being drawn entirely within the protuberances on the surface of the *Alcyonia*, and even these projections become flattened when the animals are in a state of great contraction. In this condition they are often left by the tide, and if then placed in a glass of clear water, their gradual expansion may be watched. The protuberances from the surface first show themselves, and the polypes, one by one, appear at their summits, and slowly expand their tentacula, until the whole surface appears covered with delicate blossoms. The entire mass then not unfrequently swells to twice or thrice its original size. If any one of the polypes is irritated, it shrinks into its hiding-place, but those near it are not affected. If the irritation of the part be prolonged, however, those in the neighbourhood gradually show themselves influenced by it, and draw themselves in; and in this manner the whole mass may be ultimately affected. The same effects, however, may be produced by irritating a portion of the spongy substance intermediate between the polypes. From this it is evident, that sensibility to impressions is not confined to the polypes alone, but that the whole mass must be regarded as possessed of animal properties.

The *Alcyonia* grow in the same circumstances with Sponges, and their correspondence is further shown by the existence of crystals of silex in their tissue, which are not found in other polype-structures, the earthy matter in these being entirely calcareous. The different species of the Alcyonia, like those of the Sponges, may be distinguished by the form of the spicula preserved in the skeleton.

In other forms of this order we find the skeleton, or firm support, in a more concentrated form. Thus in the *Gorgonia*, a beautiful framework of horny matter, consisting of a stem and a minute network of branches, occupies the centre of the structure; and this is clothed with a soft flesh, through which the channels pass that connect the polypes together. This flesh is covered with a firm skin, in which a great amount of earthy crystals is deposited, so as to form a crust; and in this are the hollows or cells by which the polypes are protected. In the dead structures, with which we are familiar under the name of *sea-fans*, the dark horny flexible stem is seen to be covered in many parts with a brittle crust, often brightly coloured, which can be scaled off it and crumbled to powder. Between the two, in the living state, the fleshy coat existed; the inner part of it being in contact with the exterior of the horny stem, which was then soft and scarcely distinct from it, while the exterior part was consolidated by the earthy matter into the firm integument.

Pennatula

In the *Isis* we find less stony matter on the outside of the flesh, but a deposition of it at intervals in the stem, which thus obtains a jointed character, being flexible at the points at which the horny matter has not been consolidated. And in the *Red Coral*, the entire stem is converted into a very firm stony axis, which presents no indication of polype-cells, these being excavated only in the flesh that clothes it. The *Pennatula*, or Sea-Pen, is an interesting species belonging to the same group, and in some respects resembling the Red Coral; it has a stony axis, but this is flexible at the extremities; and it is not attached by a solid basis, but is carried about by the mercy of the waves. From the central axis, which is nearly straight, a regular series of lateral branches passes off on each side, like the barbs of a feather; and on these the polypes are situated. By the simultaneous movements of their tentacula, the animal (if it is to be called *one*) seems to have some power of directing its course, if not of propelling itself through the ocean. A small species, which is luminous at night, inhabits the British seas.

Single Polype of Pennatula.

There is one species in this order which differs from all the rest in the consolidation of the exterior rather than of the interior tissue; so that a stony *tube* is formed instead of a central stem. This is the *Tubipora Musica*, of which the skeleton is known as Organ-pipe Coral. The polypes are not here connected by any system of vessels or uniting flesh; each lives for itself alone, but a number (probably all produced from the same stock, and by offsets from each other) unite for mutual support in one structure. Each polype has a cylindrical form, and its exterior membrane is progressively consolidated into a stony tube, which is thus gradually increasing in length by new deposits at its upper end. At certain intervals the soft membrane (which is always projecting beyond the mouth of the tube) is flattened down into a sort of collar, which is consolidated likewise; and the collars of the neighbouring tubes coming in contact with one another, form a sort of floor or shelf, which greatly strengthens the mass. After this collar is formed, the tube is continued as before for another period, when a similar floor is again produced by the simultaneous action of the numerous polypes composing this beautiful structure.

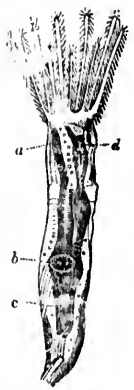
To this order the term of *Alcyonian* Polypifera (from the name of one of its principal groups) may be conveniently applied; it is also known by the designation of Asteroida, from the star-shaped form presented by the tentacula when expanded. Its most luxuriant kinds are natives of tropical seas; thus the *Alcyonium poculum*, or

Neptune's cup, which abounds in the neighbourhood of Singapore, is one of the most bulky species at present existing. But the smaller tribes abound in our own seas. No massive stony polyparies are formed by the animals of this order.

Order IV.—Ascidioida.

The last order of Polypifera far surpasses all the rest in the complexity of its organization; although so little distinguished from them in external form, that a cursory examination would not reveal the points of difference. In fact, many of the species belonging to it have been associated with the *Hydraform* Polypes, by naturalists of eminence; and it is only by means of a high and clear magnifying power that their true structure is capable of being ascertained. The stony character of the polyparies formed by others, has led them to be grouped with the *Actiniform* Polypes; and it is only within a very recent period that opportunities have been afforded for that examination of their living condition, upon which alone reliance can be placed.

The polypes of this order seem more independent of one another than they are in the associated groups of the others; but they are not known to exist in an absolutely isolated condition. A species lately discovered on the British shores, the *Bowerbankia densa*, will afford an excellent illustration of the structure of the separate polypes. These arise like buds from a sort of creeping stem, which connects them all, and which has the power of extending the structure by its own growth; but no communication has been observed between the interior of this stem and the stomachs of the polypes, like that which exists in the Sertularia. Each is enclosed in a horny transparent sheath, the upper part of which is so flexible, as to be capable of being drawn inwards by the action of muscles, thus closing the mouth of the cell.



Bowerbankia: a, œsophagus; b, gizzard; c, stomach; d, orifice of intestine.

The polype itself has, when protruded, the general form of the hydra; the mouth being surrounded by ten long and slender tentacula. There is this important difference, however, that in the Bowerbankia and all the other polypes of this order, the arms are fringed with cilia or little hair-like filaments; while in the Hydraform Polypes no such appendages exist. This difference is more important than it would at first sight appear, being connected with the whole economy of the animal. The hydra only obtains its food by grasping with its arms that which comes within their reach; but in the animals at present under consideration, the rapid vibration of the filaments, which seem to take place at the will of the polype, produces currents in the water, by which a regular stream is brought to the mouth; and this stream contains many nutritive particles, from which a selection, adapted to the highly organized digestive apparatus, may be made.

The mouth opens into a wide tube, which may be regarded in the light of the œsophagus or gullet of higher animals; and this terminates, at its lower end, in a narrow orifice leading to a globular cavity, which seems analogous to a gizzard, having thick muscular walls, lined with tooth-like processes. Here the food seems to be ground down, before being transmitted to the true stomach, a much larger cavity, situated below it, in which the process of digestion takes place. From the upper part of the stomach, not far from the first opening, an intestinal tube passes off by a distinct orifice; and this terminates on the outer side of the ring to which the tentacula are fixed.

The whole process of digestion may be distinctly watched in this beautiful little animal. The food obtained by the motion of the cilia passes into the mouth, and is propelled downwards to the first stomach or gizzard, by the successive contraction of the walls of the tube, as in the highest animals. After being subject to a brief trituration there, it is passed onwards to the principal stomach, where it remains a considerable time for digestion, being sometimes regurgitated, for a second trituration, to the gizzard. The matter to be rejected does not return, as in the lower Polypifera, by the mouth, but passes, in the form of little granules (no large substances being ever swallowed), into the intestine, where it accumulates into small pellets, which are gradually propelled to its outlet by the successive contraction of the tube. When they have been ejected from it, they are carried to a distance by the reflux of the current, which is constantly being driven by the action of the cilia to the mouth. No nervous system can be detected in these animals, yet its presence may be inferred from the existence of distinct muscular structure, of which different parts have to be put in action at the same time.

There is considerable variety in the structure of the Polypifera which have been associated into the group of which this is a specimen, some being more and others less complex; but they all agree in these two essential points—the possession of a second external orifice to the digestive cavity, and the presence of cilia on their arms. By these they are distinguished from all the other Polypifera. The latter of these characters has been embodied in the term *cilio-brachiata* (ciliated-armed), which is very appropriate. They have also been called Bryozoa, from their fancied resemblance to mosses; and Ascidioida, from their affinity to the *ascidiæ*, a group in the lowest class of Mollusca.

The polyparies formed by the animals of this group differ considerably from each other in the structure and arrangement of their parts. Frequently they have but a horny texture; sometimes, however, stony matter is deposited in the cells, and fills up the interspaces between them. A very common kind of compound structure is the *Flustra*, which grows in flat expanded surfaces, often encrusting sea-weeds and other marine bodies, but sometimes without any such attachment. This may be picked up on almost any of our shores; it is often mistaken for a sea-weed, but is distinguishable from it by its greater crispness and firmness of texture, and by the cells which may be observed to cover its surface. These cells are extremely minute, and are set closely together, so that a very large number, each when alive containing a polype, exists in each specimen. The polypes of this order are also reproduced by the formation of gemmules, somewhat resembling those of Sponges and Sertularia, but endowed with greater activity, and with apparently greater power of directing their movements. These are developed from the inner membrane of the cell, and gradually increase so as to fill up its cavity, and to cause the death of the contained polype. When they at last escape, they swim, like animalcules, with a great variety of movements; and seem to have a perfect control over the vibrations of the cilia with which they are covered, and by which all their motions are produced. When they at last fix themselves, they spread themselves out each into a gelatinous film, in the substance of which the outline of cell soon shows itself, and the polype, with all its complex parts, is developed by degrees. To this first-formed cell others are soon added.

The Polypifera of this order seem to attain their full development under a less constantly elevated temperature than that required by the Helianthoida. Stony corals are formed by them in many seas of the tempe-

rate zone, and the more delicate species abound on our own coasts. This fact is interesting when we compare the fossil with the recent corals, as will be presently done.

When we consider the vast extent of the coral formations, which are at the present time effecting a change on the surface of the globe that has been a fertile theme of astonishment and admiration, we cannot but be struck with the enormous amount of animal existence that must be concerned in producing them. Much error has prevailed on this subject, however; and in some points exaggerations have been produced through superficial observation. But here, as in almost every department of nature, the truth, as disclosed by a more careful examination, is far more wonderful than the showy covering in which the common love of the marvellous may have enveloped it.

It is generally stated that the coral masses, forming reefs or islands, are built up from the depths of the ocean. This is not strictly true; for it is well ascertained that none of the species which form the massive stony structures of which these are composed, can exist at a greater depth than from 80 to 120 feet. It is evident, then, that supposing the relative level of the land and sea to have been always the same as at present, these coral structures must be based on the summits of submarine mountains or ridges of hills, which rise from the bottom of the ocean, like corresponding hills and ridges upon the dry land; since deep water is almost always to be found in their neighbourhood. This is probably true to a certain extent. There is reason to believe that solid rock exists at no great depth beneath the surface of some of the islands; and there are many in which it forms part of them, a cone of rock rising out of the water, encrusted with a terrace of coral. Moreover, it may be stated as a general fact, that there is no part of those seas in which the temperature, depth of water, and other circumstances, are favourable to the operations of the coral-polypes, in which they are not constantly at work; and thus channels are being constantly rendered narrower and less deep, and harbours are being blocked up which were formerly accessible. But this takes place with less rapidity than is generally imagined.

The coral islands of the Pacific and Indian Oceans constitute a large proportion of the groups with which that vast area is scattered. In some instances they are considerably elevated above its level; but in general their surface is but little raised above it. As the polypes do not build above low-water mark, it does not become at once apparent how even this elevation is attained. It is to be remembered, however, that in the tropical ocean there is an almost constant succession of waves driven by the trade-wind from east to west. These, dashing against the windward side of the islands, break off blocks from the masses of coral, which they cast upon the summit. An accumulation of these blocks, consolidated by smaller fragments, and by the sand resulting from their constant friction, gradually produces a firm rocky superstratum. The surface of this, decomposed by the atmosphere, forms a sort of chalky soil, which is well adapted to the growth of many kinds of plants; and their seeds being drifted by the sea, or brought through the air by birds, take root in it, so as speedily to cover the island with a luxuriant vegetation. The growth and decay of successive crops gradually covers with a thick layer of mould the previous chalky soil; and this affords support to the most beautiful kinds of tropical plants, which the humidity of the insular atmosphere causes to flourish to a degree rarely seen on continents.

Several of the coral islands take the form of rings, containing large basins of water communicating with the sea, which are termed lagoons. These were probably erected on the craters of submarine volcanoes; of the existence of many of which, beneath the Pacific Ocean there can be no doubt. They first rise to the surface in the form of circular reefs; the windward side is gradually raised above the sea-level by the process already described; but an opening usually remains at the leeward side, through which the water that washes into the central basin may flow out. As the whole ring is gradually elevated, however, the source of this overflow diminishes, and gradually ceases, the channel is filled up by the growth of coral, and the lagoon is cut off from the sea. This basin, also, is at last filled up by the accumulation of fragments of coral, and by the growth of the more delicate species in its interior; and at last one nearly uniform surface is produced.

There is reason to believe, however, that in many instances the coral extends to a much greater depth beneath the surface than that in which the animals are known to live; and the question then arises, in what manner was it formed? A careful examination of the islands of the Pacific Ocean shows us that many of them, which rise considerably above the surface, are entirely composed of coral. Now, as the coral-polypes never build above the level of the sea, it is evident that some subterranean movement, probably of a volcanic nature, must have lifted these islands from the bed of the ocean. In some instances the height at which coral may be found is very great—not less than eight or nine thousand feet. It is not improbable, then, that as the bottom of some parts of the ocean is rising, that of others should be falling. If a coral island had been originally formed in the usual way, and had then gradually sunk in the water, the polypes would have continued to build it up to the surface; and thus almost any amount of thickness may be produced, by a corresponding slow subsidence.

One of the most extraordinary coral growths known, is the barrier-reef which stretches along the shores of New Holland, at a distance of usually more than a hundred miles from the coast. This is above a thousand miles long; and for several hundred miles has no break wide enough to give passage to a ship. It is scarcely conceivable that a submarine ridge of hill should exist, a thousand miles in length, and approaching everywhere within one hundred feet of the same elevation; for such a ridge is nowhere seen on the dry land. But it is easy to account for this remarkable structure, if we suppose that the ridge was formerly more or less elevated above the surface; and that its different parts gradually became encrusted and capped with coral as they were submerged, after which the growth would continue upon the same parts, until the whole, being thus depressed and covered, became the continuous mass which is now witnessed. That such depressions *are* taking place in some islands of the Pacific, is a fact substantiated, not only by the traditions of the natives, but by observations made since they have been visited by Europeans.

There are many instances in which the coral structures of comparatively recent origin have undergone a metamorphosis, which causes them to lose in some degree their original aspect. Large masses, when long exposed to the air, become changed into a solid, often somewhat crystalline, rock, in which the traces of organic structure are very indistinct, and with which the *mountain* or *secondary limestone* closely corresponds. This is observed in the Bermudas. Moreover, the coral sand often becomes agglutinated, by the percolation of water through it, into a very hard stone; it is in such a mass that the human skeleton, found on the shore at Guadaloupe, and now placed in the British Museum, is imbedded. This stone, when minutely examined, is seen to consist of a number of rounded grains, cemented, as it were, together; and it closely resembles the rock known to the geologist as *oolite*. Further, where shallow water exists around coral islands, the bottom is found to be covered with a layer of white mud, which is formed by

the decay of the animal matter that held together the particles of carbonate of lime in the stony corals, and these are consequently set at liberty in a finely-divided state, and fall to the bottom in a form which, if dry, would constitute *chalk*. Thus we may trace, very distinctly, the mode in which the three principal kinds of limestone rocks may have taken their origin in coral formation.

Now, the mountain limestone, as it is termed—a rock very abundant in Britain, extending over large areas beneath the coal-fields, and sometimes exhibiting a thickness of nearly 3000 feet—is in some parts evidently composed of accumulations of shells, stems of encrinites, &c. But in many others, the remains of corals are very distinct; and these are so blended with the neighbouring rock as to make it appear probable that the latter also was once in the state of coral, but was gradually changed by the process just described. Further, the collections of other animal remains are just such as we should expect to find on the margin of a coral reef or island existing at that epoch; and a similar process of fossilization is taking place on the shores of those existing at the present time; the imbedded series of animals being different. The great thickness of the beds of may be very well accounted for, in the same the depth of the coralline masses of recent

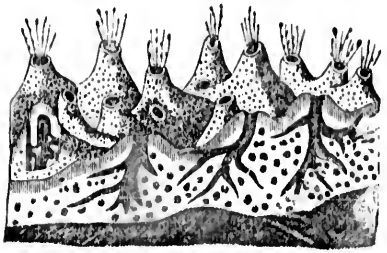
There are observed, in rocks of more recent appearances which still more clearly indicate too were originally formed by coral-polypes. often found only within narrow limits, as if they had been reefs or islands of small size. Thus we find a stone called coral-rag in Oxfordshire; and very distinct coral beds in the crag of the eastern coast of England. It is interesting to remark, that the remains of coral which are found in the older limestones, all correspond with those at present abounding near the equator, and exhibit the *lamelliform* character; while they are gradually replaced in the newer strata by species more allied to those at present existing in temperate climates. This is one of the many facts which tend to prove that this part of the earth had at some former period a much higher temperature than at present.

We see, then, that vast as are the works of the existing species of this class, they are probably far surpassed by the accumulations of former ages, which constitute, in some form or other, a large proportion of the solid rocks of our terrestrial surface. And thus we see the exemplification of a principle which has frequently come under our notice—that in the economy of Nature nothing is insignificant; and that the most gigantic effects may be produced by the multiplication even of the humblest among the living inhabitants of the globe.

CLASS XXIII.—PORIFERA.

Of all the beings usually known under the designation *Zoophytes*, the *Sponges* and their allies, constituting the class Porifera, appear to have the best claim to the title; since they present so complete an admixture of the characters of plants and animals, that it is difficult to say to which division of the organized world they properly belong. Like plants, they are fixed to one spot during the whole of their lives, subsequently, at least, to their first development, they seem to possess no sensibility, for they can be torn or wounded in any way without showing by their movements any indication of being affected by the injury; and they do not appear to have that power of executing voluntary motions which must be regarded as the distinguishing characteristic of animals. On the other hand, they present a structure which is not analogous to any thing found in plants, but is similar to that of beings undoubtedly belonging to the animal kingdom, with these beings they are connected by intermediate forms, presenting a regular gradation of increasing complexity of structure and variety of function; and there are certain movements, both in the adult and in the undeveloped Sponge, which are more analogous to those seen in higher animals than to any observed in plants. On the whole, however, the evidence for the animal character of the *Sponges* seems to preponderate; and they will be accordingly considered here. Still there is no doubt that, if they are included in the Animal Kingdom at all, the lowest place in the scale should be assigned to them.

The common *Sponge* is a sufficiently characteristic form of this class, to serve as the foundation of a general

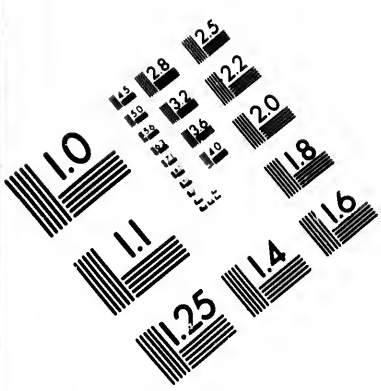


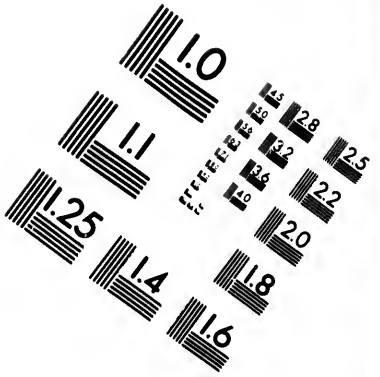
Section of Living Sponge.

account of the structure which prevails in it. On looking at its exterior, we observe that it is covered by a number of closely set and minute orifices; and that larger openings are disposed at intervals among these. The former are termed *pores*, the latter *vents*. On cutting into the substance of the sponge, it is seen to consist of a sort of network or filaments, interlacing together in such a manner as to leave large channels and spaces of various forms, which communicate with each other. The large channels terminate in the vents; and on tracing any one of them into the substance of the sponge, it is seen to divide and send off ramifying branches, which at last lose themselves in the spongy network that lies around them; and this communicates with the pores on the external surface.

The interlacing fibres, of which the walls of the large canals, and the spongy tissue between them, are alike composed, entirely consist (in the common sponge) of a sort of horny animal matter, as is shown by burning a small portion of them. But in other species we find *spicula*, or needle-like crystals, of silex or of carbonate of lime, disposed among these, giving to the structure much greater firmness, but depriving it, more or less completely, of that elasticity which is so useful in the common sponge.

The substance known as *sponge* is, however, but the skeleton of the being; when alive, this fibrous network is clothed, within and without, by a thin gelatinous substance, very like the white of an egg. This lines all the passages, and covers the exterior; but it drains away when the sponge is removed from the water. In this the peculiar vital endowments of the being appear to reside. These are manifested, not only by its slow but regular growth, but by a curious circulation of fluid, constantly taking place within the mass. When a sponge is examined in its living state, beneath the water, a constant current is seen to issue from the vents; being made evident by the disturbance of the water, and by the movement of particles floating in it. It may also be ascertained that a constant flow of water takes place inwards through the pores; for small solid particles upon their edges are occasionally seen to be sucked in. No intermission can be detected, during the life of the sponge, in these currents, which evidently have for their object to





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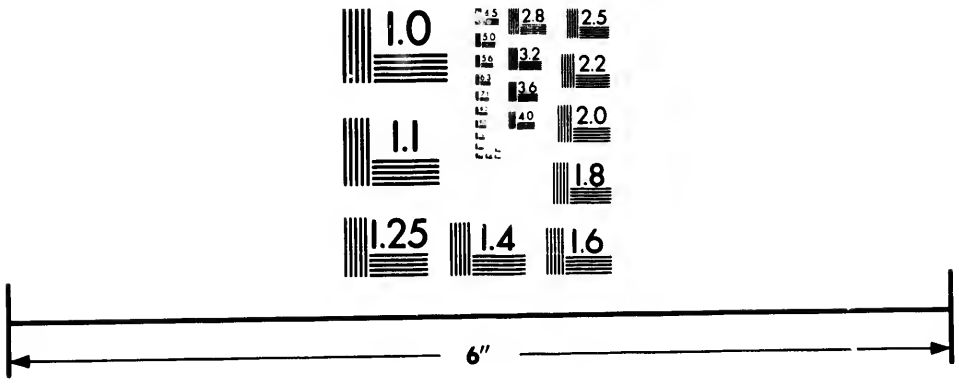

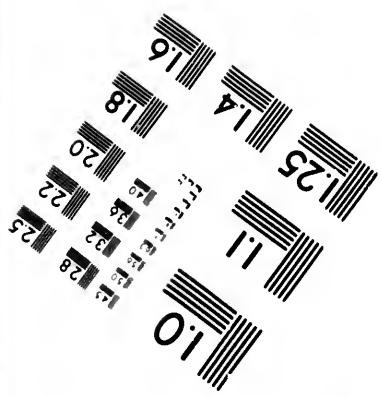

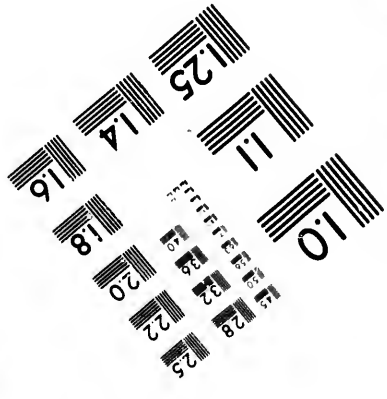

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convey the nutritive matter contained in the water into the interior of the mass, and also to carry off the particles which are to be excreted, since thin films detached from the living tissue are seen to pass out from the vents along with the fluid ejected from them.

The relative position of the *pores* and *vents* differs much in the different kinds of sponge. Sometimes all the former are on one side, and the latter on the other. Not unfrequently the vents are placed on the summit of little conical prominences, which look like craters of a volcano; and the stream issuing from them, when seen under a microscope, may be likened to a miniature eruption. Sometimes the sponge assumes the form of a hollow cylinder, which hangs at one extremity from a rock; the pores are all upon the exterior surface, while the vents open into the interior cavity, and their united stream rushes out with considerable energy from the lower end of the cylinder.

Sponges may be multiplied, like plants, by artificial division, each portion becoming a new individual, but it does not appear that this is their natural mode of increase. They propagate by detaching little round gelatinous bodies, termed *gemmules*, from their living tissue; which in time develop the original form of the parent. These are produced in the network between the large canals, into which they find their way; when mature, they pass out of the vents in the current which sweeps through them, and by which they are conveyed to a distance. In these gemmules a peculiar motion, like that of animalcules, may be seen for some time; they swim hither and thither; at last they fix themselves, and begin to deposit the horny or earthy particles which are to form their skeleton; and the system of canals gradually shows itself in their substance. When once they have fixed themselves, they seem to lose all power of further movement, and remain during the rest of their lives attached to the same spot.

Some kinds of sponges are found on almost all shores; and some frequent deep water, whence they can only be obtained by dredging. It is in this manner that the common sponge is procured from the Mediterranean, the Grecian archipelago, and the other localities it frequents. Sponges are not confined to the sea, however; for there is a species which inhabits fresh water.

With the notice of this group we appropriately close the subject of Zoology.

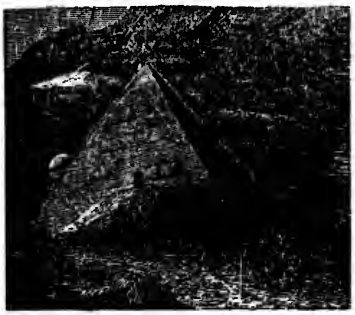
[BOOKS ON ZOOLOGY.

Among the various works which have been published on the subject of Zoology, few are entitled to confidence. The errors of the older writers are numerous, and some of them of a ludicrous character, as, for example, where Gerard, in his Herbal, gravely assures the reader that the Barnacle Goose grows upon a tree, germinating from a barnacle shell adhering to old water-soaked logs, trees, and other pieces of wood cast up by the sea, and called, from this wonderful circumstance, the "Goose-bearing tree." Many of the assertions in Goldsmith's Animated Nature are just as well founded; and yet the delightful style of Goldsmith commends his book to almost universal favour, and will long continue to do so.

In Natural History, Linnæus was the great reformer of the last century, as Cuvier was of the present. The minute classifications of the former gave precision to the science, and the researches of the latter in comparative anatomy have given it a simplicity, compactness, and certainty, which leaves nothing to be desired with respect to system. The following out of details will of course continue for centuries

The writings of Linnæus and Cuvier are the great classical works of the science. For popular use we commend to the reader the articles on Zoology in the Penny Cyclopædia and the British Cyclopædia of Natural History, and particularly the Pictorial Museum of Animated Nature, published in London, by Charles Knight, in two quarto volumes. It contains the most complete collection of well-figured animals attainable at a moderate price. The works of Wilson and Audubon are invaluable, but rather costly. Nuttall's Ornithology is a first-rate work, afforded at a moderate price. Most of the cheap compends of Zoology copy the errors of the old writers, and of course are of little value as authorities.—*Am. Ed.*]

ANCIENT HISTORY—EGYPT.



Great Pyramid of Cheops, in its present condition.

Ancient History usually commences with an account of the creation of the world, as narrated by Moses—the subsequent dispersal of mankind over the earth—the flood of Noah—and the re-settling of the human race in Asia, Africa and Europe, after that disastrous event. But to the annals of these early times it is unnecessary here to advert. We take up the history of antiquity at a period less remote, or from 2000 to 1000 years before Christ, when Egypt and the adjacent territories were illumined with the light of science and the arts.

It is important, at the outset of our sketch, to call attention to the fact, that the whole of ancient history refers to a limited cluster of countries on or near the shores of the Mediterranean. By a glance at the accompanying map, it will be perceived that Egypt, also the country of the Carthagenians, in Africa; Syria and Palestine, (including the country of the Phœnicians,) Arabia, the country of the Chaldeans, Babylonians, Medes, Persians and Assyrians, in Asia; and Greece, Italy, and other countries of the Gentiles, in Europe—all lie upon, or at no great distance from the Mediterranean. To the countries, therefore, adjacent to this inland branch of the Atlantic ocean, the knowledge of the ancients was chiefly confined, or at the utmost did not extend in an easterly direction beyond Hindostan, or the country of the Moguls. In consequence of this limited knowledge of geography, as well as the natural but very erroneous notion that the world was only a great stretched-out plain, the Mediterranean sea received the name it now bears, which signifies the *sea in the middle of the earth*—the central ocean round which the human race had been planted.

The world, as thus known to the ancients, may be described, in general terms, as a region extending from the 10th to the 50th degree of north latitude, and from the 1st degree west to the 70th degree of east longitude, and comprehending only limited districts of Africa, Asia and Europe—the whole composing a most insignificant portion of the globe. As far, however, as is learned from the records of sacred and profane history, it was in some spot within this anciently settled territory that science, learning, and the arts originated, and spread over the earth; and as thus forming the cradle of modern civilization, the region is invested with an interest due to its former greatness. Yet the political history of the empires and kingdoms which anciently flourished in this once favoured territory, is on the whole unworthy of lengthened study. Time is only thrown away in the vain endeavour to unravel the vague and offensive details of kingdom warring against kingdom, tribe against tribe, and each in its turn assailing and overpowering its more feeble neighbour. Thus, the Chaldeans in the south-east of Arabia were overpowered by their neighbours the Babylonians, the Babylonians by the Assyrians, the Assyrians and Egyptians by the Persians, the Persians by the Greeks, and the Greeks by the Romans while these latter, who had swallowed up the whole of their predecessors, were in their turn overpowered by barbaric hordes from the north of Europe, or by nearly equally savage tribes from the east. In this manner the bulk of ancient history is little else than a record of oppressions, conquests and crimes, and in the main exhibiting few facts which are of value either for amusement or instruction. Ancient history is indeed only interesting where it throws light upon the origin and progress of our religion, or upon the primeval state of learning, philosophy, and the arts; as a chronicle of mere wars and conquests, it is utterly valueless.

Whatever may have been the extent of knowledge in

letters, science, or the polite arts, gained by the ancient Chaldeans, Babylonians, or other Asiatics, it is generally understood that it fell short of what existed about the same period (2300 to 1000 years before Christ) among the inhabitants of Egypt, from which certain kinds of learning spread to Greece, from Greece to Rome, and from Rome over western Europe, including the British islands, and all other modern countries. By a clear line of descent, therefore, we trace the rudiments of modern civilization to Egypt, a land which is deserving of our notice, not only on this account, but on that of its magnificent remains of art, which till the present day astonish the mind of the traveller.

As thus interesting from their connection with modern civilization, or with our religion, we offer sketches of the history of Egypt, Palestine, Greece, and Rome, with some account of these countries, confining ourselves in the present instance to Egypt.

EGYPT—ITS HISTORY.

In point of local situation, Egypt possesses various advantages.* It lies in the north-east corner of Africa, in a salubrious part of that vast continent, presenting its northern base to the Mediterranean Sea, and bounded on the east by the Red Sea, which separates it from Asia. Through the whole land, from north to south, a length of 900 miles, flows the Nile, a fine large stream rising in the inland kingdom of Abyssinia, and, from certain periodic floods, of great use in irrigating and fertilizing the country. A large portion of Egypt consists of an alluvial plain, similar to our fertile meadow-grounds, formed by the deposits of the river, and bounded by ranges of mountains on either side. The greatest breadth of the land is 150 miles, but generally it is much less, the mountain ranges on either side often being not more than five to ten miles from the river. Anciently this territory was divided into three principal parts—Upper Egypt, or Thebais (from Thebes, its capital city), which was in the inner or southern part; Middle Egypt; and Lower Egypt, which included what was called the Delta, a low district of land on the shores of the Mediterranean, formed by the mouths of the Nile into the shape of the Greek letter Δ, or delta.

The history of the people who at one time inhabited this remarkable country is carried by their annalists to the very earliest ages; indeed, to a period far more remote than that ascribed by Moses to the creation of the world. When divested of fable, it appears that an Egyptian monarchy was established by Menes, or Misraim, in the year of the world 1816, and that it lasted till the year 3479, when it was destroyed by Cambyses, King of Persia. To Misraim succeeded a line of sovereigns of great power and fame, almost every one of whom seems to have delighted in rearing edifices of extraordinary magnitude and splendour. Extensive and beautiful cities, obelisks, pyramids, and temples, were erected without regard to the toil or resources of the people; and as their remains are till this day extant, and have been described by travellers, we are impressed with the most significant tokens of the taste and knowledge of the ancient Egyptians. Although each of the Egyptian monarchs was distinguished by his own peculiar name—as Moeris, Rameses, Sesostris, Pheron, Cheops, &c.—those who reigned for a considerable period, in lower Egypt especially, were designated Pharaoh, a title commonly used in Scripture to express the Egyptian rulers at the time. The Pharaoh who was noted for his oppression of the Israelites, and who flourished 1577 years before the Christian era, was properly called Rameses Miamum, while his son, the Pharaoh under whose reign the Children of Israel departed out of Egypt, and who was drowned in the Red Sea, was entitled Amenophis.

* Egypt is called Mazr by the natives.

The country thus governed, by a course of circumstances unknown to the present age, and which will most likely ever remain hid from our understanding, was among the first on the face of the earth which exhibited any demonstrations of refinement in taste. "This kingdom (says Rollin) bestowed its noblest labours and finest arts on the improving of mankind; and Greece was so sensible of this, that its most illustrious men—as Homer, Pythagoras, Plato, even its great legislators Lycurgus and Solon, with many more—travelled into Egypt to complete their studies, and draw from that fountain whatever was most rare and valuable in every kind of learning. God himself has given this kingdom a glorious testimony, when, praising Moses, he says of him, that 'he was learned in all the wisdom of the Egyptians.'" Such was the desire for encouraging the growth of scientific pursuits, that discoverers of any useful invention received rewards suitable to their skill and labour. They studied natural history, geometry, and astronomy, and, what is worthy of remark, they were so far masters of the latter science as to be aware of the period required for the earth's annual revolutions, and fixed the year at 365 days 6 hours—a period which remained unaltered till the very recent change of the style. They likewise studied and improved the science of physic, in which they attained a certain proficiency. The persevering ingenuity and industry of the Egyptians are attested by the remains of their great works of art, which could not well be surpassed in modern times; and although their working classes were doomed to engage in the occupations of their fathers, and no others, as is still the custom in India, society might thereby be hampered, but the practice of handicrafts would be certainly improved. The Egyptians were also among the first people who were acquainted with the processes of communicating information by means of writing or engraving on stone and metal; and were, consequently, the first who formed books and collected libraries. These repositories of learning they guarded with scrupulous care, and the titles they bore naturally inspired a desire to enter them. They were called the "Office for the Diseases of the Soul," and that very justly, because the soul was there cured of ignorance, which it will be allowed, is the source of many of the maladies of our mental faculties. As these repositories of the learning of the ancient Egyptians were all destroyed, and are only known from the records of historians, the work[illegible]eir sages and poets cannot now be shown; and [illegible] little else than the inscriptions on stones found [illegible]dst the ruins of pyramids and temples, that we are so much as aware of the nature of the characters employed in their writing. These characters were exceedingly curious, consisting chiefly of representations of animate and inanimate objects, each of which stood for some particular idea. The use of emblematic figures seems to have been, as it still is, common among uncultivated races of men, being the first approach towards literature; but the use of an alphabet, by which words are formed by combinations of different characters, was in early times confined entirely to the Egyptians, from whom the invention was communicated across the Mediterranean to Greece, by a person of celebrity called Cadmus, and from thence spread into other European nations. It is also understood that the Israelites, and other Asiatics, received their knowledge of letters from the learned inhabitants of Egypt. The use of rude emblematic figures was not abandoned by the Egyptians as letters became known, but continued chiefly to denote matters of a mysterious or religious tendency. These figures have received the name of *hieroglyphics*, and are of various kinds, more or less significant of the thing or idea intended to be expressed. For thousands of years the world remained in total ignorance of the manner of deciphering these hieroglyphics, for the Egyptians left no clue whereby to make the discovery; and it

was only in 1814 that, by the researches of some Frenchmen, a key to certain kinds was made known. It was found that, although the figures often signify the thing which they represent—for instance, the figure of a lion signifying that animal—yet that in many instances it does no such thing, but stands simply for the letter L, which is the initial letter in the word *lion*. The discovery of this mode of deciphering the Egyptian hieroglyphics, by reckoning only the initial letters in the names of the things represented, lays open a wide field for the investigation of learned and inquisitive travellers in the ancient territory of the Pharsohs.

The comparative intelligence of the Egyptians did not rescue them from the most debasing superstitions in their religious faith. They had a great number of ideal gods; among others, Osiris and Isis, which are thought to have been the sun and the moon. They also worshipped a number of beasts, as the ox or bull (under the name of Apis), the dog, the wolf, the hawk, the crocodile, the ibis or stork, the cat, &c.; and such was the reverence which they paid to these animals, that, in extreme famine, they chose to eat one another rather than feed on their imagined deities. The Egyptians had a belief, inculcated by their priests, that the souls of men, after death, passed into the bodies of clean or unclean animals, according to the deeds done in the body, and that at a distant period of time they returned to the body to which they originally belonged. A doctrine so extravagant led their kings to build enormous architectural edifices for the reception of their bodies, in order that they might, as they thought, repose in safety till they were again to be endowed with a living soul. In this fantastic notion we find a satisfactory solution of the mysterious practice of inhuming mummies in those huge pyramids, now reckoned among the greatest wonders in the world.

In the days of Egypt's ancient glory, it was dignified with two greater and many lesser cities. The two principal were Thebes, the capital of Upper Egypt, and a city of extraordinary extent and splendour; and Memphis, the capital of the middle district of the country. Memphis was built on the west side of the Nile, and has been succeeded by the comparatively modern city of Cairo, on the east bank of the river. On the site of Thebes and Memphis, and in their neighbourhood, are now found the greatest quantity of the ruins of ancient temples and other magnificent erections. In the present day Thebes receives the name of Said.

Like all other distinguished nations of antiquity, Egypt, after a lengthened period of extensive civil power, military glory, and dignified learning, suffered a series of reverses of fortune, and finally sank into a state of utter poverty and barbaric ignorance. The proximate causes of this disastrous event were the political distractions of the country, and the rise of a greater power in the vicinity—that of Nebuchadnezzar, king of Babylon. But in this, as in every other instance of national ruin in ancient times, the principal causes of the disaster were the ill-balanced condition of society, and the general ignorance of the people; the nation did not possess the elements of stability, and became an easy prey to a more powerful and savage neighbour. The country was overrun by Nebuchadnezzar and his hosts, 569 years before Christ, when an immense quantity of its movable wealth was carried off. About forty-four years afterwards, Egypt was again intruded upon by force of arms, and fell a prey to the conquering hordes of Persia under Cyrus, when many of its edifices were destroyed. It now became a distant colony of Persia, which maintained an authority over it for more than 200 years, at the end of which it was seized by Alexander the Great, a monarch of Greece, who shortly afterwards conquered the whole of Persia. Besides settling the government of the country, Alexander improved it in various ways—among the rest of his enterprises, building the city of Alexandria, which he called after his own name; and as it was placed on the sea-coast, at one of the mouths of the Nile, it speedily rose to be one of the largest and most opulent seaport towns in the world. Upon the division of the Persian empire some time later, Egypt fell to Ptolemy Lagus, one of Alexander's generals, who was succeeded by a race of princes distinguished by the name of Ptolemy, in addition to their other appellations; and hence the Ptolemies of Egypt who are spoken of in ancient history. The last royal descendant of this noble Grecian line was Cleopatra, a princess of great beauty and accomplishments; and at her decease, which she accomplished by suicide, the land of Egypt became a province of Rome, some of whose emperors endeavoured to revive in it a love of letters, and enriched it by various improvements. Subsequently, Egypt fell into a state of ruinous distraction, consequent on the troubles and decline of the Roman government, and was at last completely subdued by the Saracens, who introduced the religion of Mohammed, destroyed the libraries, and, as far as possible, the splendid works of art; so that, under their sway, every species of barbaric rudeness was made to supersede the ancient refined habits of the people. Since that dismal epoch, Egypt has, century after century, sunk deeper and deeper into a state of perfect neglect and ruin. In recent times it has been under the immediate rule of Mehemet Ali, nominally a pacha of the Sultan of Constantinople, and by whom, with considerable suffering to the poor inhabitants, certain improvements have been effected.

DESCRIPTION OF THE COUNTRY.

As already mentioned, Egypt consists of the long flat valley of the Nile, from Abyssinia on the south, to the shore of the Mediterranean Sea, and nominally consists of three divisions, the Delta or lower region, Middle, and Upper Egypt. It is said to contain 200,000 square miles, but only about 16,000 of these are susceptible of cultivation. In ancient times, the country was more generally fertile than in the present day, owing to the encroachment of the sands of the adjacent deserts, and the long period of desolation and mismanagement in which it has existed. Still, owing to the inundations, the lands are more than usually productive, and yield crops of wheat, barley, rice, millet, maize, flax, beans, cotton, tobacco, the sugar-cane, and other useful vegetables. Of fruits, the citron, lemon, pomegranate, apricot, banana or plantain, and the palm-date, flourish luxuriantly. The palm is cultivated to a large extent in the inundated and irrigated lands, and groves of it, yielding a delightful shade, are to be seen, consisting of several thousand trees. Another celebrated production of Egypt is the lotus, a species of water-lily, of great beauty, exhibiting broad round leaves, amid which the flowers, in the form of cups, of bright white and azure, expand on the surface of the waters. The roots of vegetables were used as food by the ancient Egyptians. There is also the papyrus, not less celebrated than the lotus, and which furnished a material used as paper, before the invention of that article; it is, like the lotus, an aquatic plant, growing to the height of eight or ten feet amid the swamps of the Nile. The filaments of the plant being separated and cemented together in pieces, formed sheets whereon writing was executed. (See article PAPER-MAKING.)

THE NILE.

The most remarkable natural object in Egypt is the Nile, which periodically overflows its low banks, and inundates the greater part of the country. The Nile is formed by the union of two streams in the upper country, the Bahr-el-Abiad (white river), and the Bahr-el-Azrek (blue river), in lat. 15° 40′ north. The former, rising in Abyssinia, to the south-west of lake Dembea, comes from the south-east, and was considered by Bruce

as the Nile. The latter, however, which comes from the south-west, and is supposed to rise in the Mountains of the Moon, in the centre of Africa, brings down the greatest mass of water, and is considered as the true Nile. In lat. 17° 40′ it receives the Tacazze from the east; enters Egypt in 24°, following nearly a northern course; and below Cairo (30° 15′ north) divides into the two main arms, as we have already mentioned. There were anciently reckoned seven principal mouths, by which its waters were poured into the Mediterranean; only those of Damietta and Rosetta are at present navigable; the others have been choked up. The distance from the confluence of its two head branches to the sea, is about 1500 miles; from its highest sources probably not far from 2500 miles. At certain points in its course, the Nile falls over a series of cataracts, or, properly speaking, descends a series of tumultuous rapids, for the fall is nowhere above two feet of sheer descent. The cataracts are not altogether a bar to navigation, as vessels which sail up the river may be drawn up by an extraordinary force. There are parties of Arabs who make a business of hauling boats up the cataracts. The Nile has also numerous islands in its course.

The grand phenomenon connected with the Nile, is its annual overflow of the banks which border it—an event looked for with as much certainty as the daily rising of the sun. These inundations of the Nile are owing to the periodical rains which fall between the tropics. They begin in March, but have no effect upon the river until three months later. Towards the end of June it begins to rise, and continues rising at the rate of about four inches a-day, until the end of September, when it falls for about the same period of time. Herodotus, the Grecian historian, informs us, that in his time a rise of sixteen cubits was sufficient to water the country. At present, twenty-two cubits are considered a good rise. The towns are generally built in such a situation and manner as not to be overflowed by the inundation, and in some parts of the country there are long raised causeways upon which the people may travel during the floods. It is only in cases of an extraordinary rise that any villages are destroyed. The inundations, instead of being viewed as a calamity, are considered a blessing, for they are the cause of inexhaustible fertility. After the waters have subsided, the earth is found covered with mud, which has been left there by the river. This mud, which is principally composed of argillaceous earth and carbonate of lime, serves to fertilize the overflowed land, and is used for manure for such places as are not sufficiently saturated by the river; it is also formed into bricks, and various vessels for domestic use. The whole valley of the Nile may be considered as an alluvial plain formed of the washed-down mud and sand of central Africa, and it is therefore to these inundations that Egypt owes its existence. The accumulation of soil has been estimated at about forty feet within the last four thousand years.

In Upper and Middle Egypt, there are immense numbers of canals on the left bank of the river. Mehemet Ali, the present pasha, has opened many of the old canals, which had been closed for centuries, and dug new ones; among the atter, the canal of Mahmoud, connecting the harbour of Alexandria with the Nile, near Fouah, forty-eight miles long, ninety feet broad, and eighteen deep, is a magnificent work. The Delta is bordered by a number of maritime lakes or lagoons, which at different periods have undergone considerable changes; some of them had been dried up, when, from various causes, their connection with the ocean, which had been interrupted, was again resumed, and the exhausted basins replenished with water. In the ancient Egyptian mythology, the Nile was revered as the tutelary deity of the country. His attributes are the crocodile, the sphinx, the hippopotamus, and the dolphin.

It might be supposed that in consequence of the annual inundations, Egypt would be a wet or moist country; but the very reverse is the case. The waters are speedily dried up and carried off as vapours by the winds, leaving the climate so remarkably dry that meat in the open air will not putrefy, but be dried or shrivelled up. Rain, snow, thunder, or any of the common atmospheric phenomena, are seldom or never seen or heard. In consequence of the dry arid heat during most part of the year, hot winds from the sandy deserts, and the mode of living of the people, ophthalmia, or disease of the eyes, is common, and many of the inhabitants are blind of one or both eyes. The principal winds blowing over the country are from the north, and are of great use in tempering the atmosphere and wafting vessels up the Nile against the current.

To the above account of the Nile, we add the following pleasing sketch by Mr. Bowring, as given in his interesting small work for youth, entitled "Minor Morals:"—"Among the Egyptians, the attachment is less to the soil than to the river—the river Nile, which is in their eyes, as it was in the eyes of their forefathers, a sort of divinity. They speak of their Nile with the intensity of personal affection—it is their daily benefactor; to it they owe their wealth, great or small—the verdure of their fields, their food, their drink, their clothing—for it produces the vegetables and the fish they eat; it gives the water with which they quench their thirst and cook their victuals; it causes the cotton tree to grow, of which they make their garments; it supplies their flocks and herds. There is not a woman on its banks who, from the time at which she is first able to carry a pitcher on her head or bear one in her hand, does not daily replenish it in the sacred and venerable stream. Its praise passes into proverbs, into their daily talk. I remember travelling to the Bahr el Yeressouff, and having alighted, I gave my horse to a poor Fellah woman; when, on remounting, I put a small coin into her hand, she said, 'May Allah bless thee as he blessed the course of the Nile!' A hundred times I had been told in Egypt, 'You will return hither. No one ever drank the waters of the Nile without being irresistibly impelled to drink them again.' And the water, though not clean, is delicious and healthful. The Egyptian Levantines have a saying, that 'What champagne is to other wines, is the Nile to other waters;' and there is also an Arabian proverb—'Had Mohammed drunk the waters of the Nile, he would have stayed on earth, and not have allowed himself to be conveyed to Paradise.' * * * There are between 5000 and 6000 boats constantly in movement on the two branches of the Nile, the Rosetta and Damietta branches; and from the point of their union up to Assouan. There is the first cataract, as it is called but it is not a cataract; it is merely a rapid, where the waters rush through the granite rocks—having, however, channels so large that during certain months of the year the boats can be hauled through, and proceed to Wadi Halfa, the second cataract. The boats are of all sizes, from the smallest *pont* to vessels which will convey 200 tons of goods. They are for the most part of coarse construction, carrying enormously large triangular sails, and are frequently overturned by the sudden gusts on the river."

The district of country west from the banks of the river is ordinarily called the Libyan desert or division, and that on the east the Arabian.

CLIMATE—NATURAL HISTORY.

In Egypt, the harvests follow each other at the distance of about six or eight weeks, according to the different kinds of grain, leaving time in most cases for a succession of crops wherever there is a full command of water. The cold season commences with December, and continues for about two months. Early in February spring appears, when the atmosphere acquires a delightful warmth, and the trees put forth their

blossoms. The period of summer may be said to commence in June, and to end at the close of September. The transition from the one season to the other is so imperceptible that it is scarcely possible to say when the one begins and the other ends. During these four months, the heat is intense; the fields to which the swelling river has not attained, are parched like a desert, and no green leaf is seen but such as are produced by artificial irrigation. Autumn, which is only marked by a slight diminution of temperature, commences about the middle of October, when the leaves fall, and the Nile retires within its channel; and till the approach of that season, which can only be called winter from its situation in the calendar, the face of the country resembles a beautiful and variegated meadow. Volney's description is thus a matter of fact, that Egypt assumes in succession the appearance of an ocean of fresh water, of a miry morass, of a green level plain, and of a parched desert of sand.

From the nature of the surface, and the universal aridity of the surrounding desert, Egypt is much hotter than most other countries under the same parallel. From March to November, the atmosphere is inflamed by a scorching sun and a cloudless sky, the average height of the thermometer being about 90°; during the other six months, it is about 60°. At sunset, the winds fall, and the nights are generally cool, and the dews heavy. Except along the sea-shores, rain is a phenomenon in Egypt. At Cairo, there are on an average four or five showers in the year; in Upper Egypt, one or two at most; nor are they considered as beneficial to the agriculture of the country. Thunder and lightning are still more uncommon, and are likewise completely divested of their terrific qualities. Showers of hail, sweeping from the hills of Syria, are sometimes known to reach the confines of Egypt; but ice is a commodity so extremely rare, that instances have occurred of its being sold at a high price.

In its geological features, Egypt presents great variety, including specimens of almost every formation, from the earliest to the most recent. Several granitic chains of hills stretch to a considerable extent. These contain vast quarries of syenite, from which the ancients drew the stupendous masses required for their colossal statues and obelisks. Between Assouan and Esna lies the sandstone, or middle district, which supplied blocks for the temples; and beyond it, the northern or calcareous district stretches to the southern angle of the Delta. This last chain supplied materials for the pyramids, and many public buildings. The limestone extends from Syene to the Mediterranean, and, in Lower Egypt, from Alexandria to the Red Sea, in the vicinity of Suez. Other valuable rocks are abundant in Egypt, and various precious minerals are found. In zoology, the camel, so emphatically named the ship of the desert, has long been domesticated in the country. The giraffe, or cameleopard, has been occasionally seen. A quadruped, called virrera ichneumon, is one of the most celebrated animals in the country. Amongst the ancients, it was venerated with a species of worship. Ichneumons are domesticated in Egypt, where they perform the duties of our domestic cat, in ridding the houses of the smaller animals. The names of the crocodile and hippopotamus are familiarly associated with Egypt and the Nile. The number of the latter animal is now declined, and he is seldom seen below the Cataracts. A species of lizard, called the monitor of the Nile; the common cameleon; the lizard; the sorex, or shrew; and, of the marmot tribe, a particular genus called the dipus, or jerboa; the goat, sheep, and the animals which figure in the Egyptian mythology, such as the dog, ape, buffalo, &c.; still belong to the zoology of the country. Of birds, the ostrich, the ibis, of which there are several species, and the Egyptian vulture, are most famous. With respect to fishes, the country presents nothing remarkable.

INHABITANTS.

The population of Egypt is composed of an extraordinary mixture of races, and of all shades of colour some claiming to be descendants of the ancient Egyptians, though utterly degenerated, others being from Arabian or Saracenic intruders, and so on to the number of a dozen distant races, also a variety of mixtures to whom no name can be assigned. The following is the common enumeration:—1. The race called Copts, the supposed descendants of the ancient Egyptians, and more certainly the feeble remnant of a once numerous Christian population. 2. The Fellahs, who compose the bulk of the labouring class, and who are supposed to be a mixture of ancient Egyptians, Arabians, and Syrians; they are rigid Moslems. 3. The Bedouin Arabs, the same in character, manners, and customs that they are everywhere, and apparently ever have been since the days of the patriarchs, regarding with disdain and proud independence all other classes of mankind, but more especially those of their own nation who have degraded themselves by taking up their abodes within walls. 4. Arabian Greeks, that is, the descendants of ancient Greek colonists, who have lost their ancient language, and speak a kind of Arabic. Many of them are mariners, but, in general, they pursue the inferior and handicraft trades. 5. Jews. To these must be added, as inhabitants of Egypt, 6. Syrian-Greeks and Maronites, who have, within the last century, greatly increased in numbers, and have proved successful rivals of the Copts and Jews as merchants and agents. 7. Armenians. 8. Turks. 9. Franks or Europeans. 10. Mamelukes. 11. Moggrelins, or Western Arabs. 12. Ethiopians and other Africans. The following is as near an approximation as can be obtained of the relative numbers of the different divisions of this motley crew:—Copts, 160,000; Arab Fellahs, 2,250,000; Bedouin Arabs, 150,000; Arabian Greeks, 25,000; Jews, 20,000; Syrians, 20,000; Armenians, 10,000; Turks and Albanians, 20,000; Franks, 4000; Mamelukes, 500; Ethiopians, &c., 7500; which amount in all to 2,667,000. Since this list was made up, the Mamelukes, a race of foreign mercenary soldiers, have been extinguished. As being dangerous to the state, or rather opposed to the introduction of European customs, they were utterly destroyed by order of Mehemet Ali.

The Arabs have been divided into three classes:—First, the wild independent Bedouins who occupy the desert; second, the pastoral tribes, who feed their flocks upon the borders of Egypt, and occasionally enter the cultivated provinces; and lastly, the peasants or Fellahs, who are devoted to agriculture and the arts. The latter, who form the bulk of the population, are described as a fine race of men in their persons, active in agricultural employments, and possessed of many good qualities. In their dress and household economy in general, though not strangers to comfort, they are so to every thing like luxury. Their food is very plain, and none but the higher orders, or those of dissolute lives, ever taste wine. The Arabs carry on the common trades of civilized life, but in a very unskilful and imperfect manner. We shall have occasion afterwards to speak of the general state of trade and manufactures in Egypt.

The Arabs have seldom more than two wives; in general only one. The women for the most part can neither read nor write; but the better sorts are taught embroidery and ornamental needlework, in which they mostly pass their time. The features of the Arab-Egyptian women are by no means regular. They are taller in general than our European women. Their hair is black and long, their skin of a disagreeable mulatto colour, and they stain various parts of their body with colouring matter. The tented Arabs still maintain their ancient character of proud independence, and in manners

ar customs are the same people they were 3000 years ..

After enumerating the various oriental races who inhabit Egypt, it need hardly be mentioned that Mohammedism is the prevailing religion. Generally speaking, those who profess Christianity know nothing of its doctrines or moral precepts, the practice of their faith being confined to a few unmeaning ceremonies, and the repetition of a few established phrases. The whole people, high and low, are in a state of intellectual darkness; in the towns there exist, among Jews, Franks, and Turks, a degree of comfort and some wealth, but in the country parts many of the inhabitants are in a state of deplorable wretchedness; and in some places they are seen almost entirely naked, having neither regular food nor clothing, and no lodging except in holes or mud-built hovels. When they have any thing to take, they are ground to the earth by taxation, and both person and goods are at the mercy of their despotic ruler and his inferior functionaries.

ALEXANDRIA.

On reaching the shores of Egypt from the sea, the first place usually touched at by the traveller is Alexandria, the capital of Lower Egypt or the Delta. It is situated on a low flat part of the coast, at some distance west from one of the main branches of the Nile. The two main branches of the river are to the east of Alexandria—the first in this direction being that on which is placed Rosetta or El Raschid, and that still farther east being that on which Damietta is situated. Between Alexandria and Rosetta is Aboukir Bay.

The Alexandria (or Iskandria) of the present day, is very different from its predecessor, founded by Alexander the Great, and destined by him to be the centre of his empire, and of the commerce of the world. According to Pliny, it was fifteen miles in circuit, and contained a population of 300,000 individuals. It shone in all the pomp of architectural magnificence, and contained streets of immense breadth, which intersected it from end to end. Its public edifices were of the most splendid description. At one period, it is said to have contained 4000 palaces, 4000 baths, 400 public edifices, including theatres or places of popular amusement, and 12,000 shops; with, as is believed, a population of 200,000 persons. Much of its grandeur perished when the Emperor Theodosius ordered all the heathen temples throughout the Roman dominions to be destroyed; but there still survived a magnificent library of several hundred thousand volumes, including all the Greek and Latin literature of which we now only possess fragments. This treasure has been irreparably lost to the world. It was burned to ashes by the ferocious Caliph Omar, in the year 635. (See HISTORY OF THE MIDDLE AGES.) By the desolating influence of Turkish rule, the appearance of Alexandria now is most melancholy and wretched, resembling, at a distance, according to one traveller, with its gray ruins and flat-roofed houses, a town newly laid desolate by an enemy. The streets are narrow, dirty, and irregular, and usually crowded with "half-fed, half-clad" human beings. The climate of the place is also materially altered. From having been once salubrious, it is now very unhealthy. "Still Alexandria," says Sir Robert Wilson, "must be pronounced the key of Egypt, although insulated by water and desert from the surrounding country, since in its harbour alone security can be found for shipping of any burden throughout the year." The modern town does not occupy the site of the old one, which lies to the south, and presents an immense field of confused ruins. Over a space of from six to seven miles in circuit, is spread an assemblage of broken columns, obelisks, and shapeless masses of architecture, which are interspersed with some more modern buildings, such as churches, mosques, and monasteries. Amid this scene of wide-spread devastation, a few objects rise conspicuous, the most remarkable of which is "Pompey's Pillar;" it is about ninety feet high, and consists of a pedestal, a very fine shaft, and a Corinthian capital, each being composed of one entire piece of granite. Vulgar belief ascribes the erection of this pillar to Cæsar, in commemoration of his triumph over Pompey, but this is now generally considered as erroneous. The most plausible conjecture is, that it was reared by a governor of Egypt, named Pompey, in honour of the Emperor Diocletian. The next remarkable objects are the two obelisks vulgarly called Cleopatra's Needles, one standing erect, and the other lying prostrate on the sand, and greatly injured by the abrasions of footsteps and the chippings of visiters. They are composed each of a single block of granite, nearly sixty feet in length, and entirely covered with hieroglyphics. This circumstance indicates an Egyptian origin, and it is conjectured that they were conveyed thither from Memphis; in reality, they are the obelisks of a Thotmes surcharged by a Rameses. Alexandria is beginning to exhibit some marks of renovation. Mr. Stephens, a recent traveller,* observes—"I contemplated the improvements: a whole street of shops, kept by Europeans, and filled with European goods, ranges of fine buildings, fine country-houses, and gardens growing upon barren sands, showed that strangers from a once barbarous land were repaying the debt which the world owes to the mother of arts, and raising her from the ruin into which she had been plunged by years of misrule and anarchy." The pasha has here his arsenal, fort, barracks for his army, also his fleet when not in active employment; and he has endeavoured to centre here a commerce that was formerly divided between several places. Alexandria is further likely to be improved, from being an intermediate station for the new line of intercourse between England and India by way of the isthmus of Suez and the Red Sea, from which it is about eighty miles distant. The Nile, a short way above Rosetta, when reached from Alexandria, is described by Mr. Stephens as being worthy of its historic fame. "I found it (says he) more than a mile wide; the current at that season (December) full and strong; the banks on each side clothed with a beautiful verdure, and groves of palm trees—the most striking feature in African scenery—and the village of Fouah, the stopping-place for boats coming up from Rosetta and Damietta, with its mosques, and minarets, and whitened domes, and groves of palms, forming a picturesque object in the view."

ROUTE OF THE NILE—CAIRO.

Egypt, as has been said, must be viewed simply as a strath or valley of a few miles in width, with the river Nile flowing through it; it is at least only on the banks of the river that the wonderful objects of ancient art are seen, which excite the admiration of travellers. Pursuing the course of the river above the point of its separation into two main branches, these remains come first into view on approaching Cairo, at the 30th degree of north latitude. Here the river consists of one beautiful broad stream, on the east or right bank of which stands Cairo; and also on a very narrow branch, on the west or left bank, the famed Pyramids of Gizeh are situated. The site of these structures is generally elevated above the level of the plain, and stretches as a rocky platform for about fifty miles parallel with the river. Cairo, or Kahira, is not close upon the Nile, but stands at the distance of about a mile from it, at the base of the rocky heights of Mokattam, and the large village of Beulac, on the river, is its harbour or port; here, likewise, are various manufacturing and other establishments, including

* Incidents of Travel in Egypt, Arabia-Petræa, and the Holy Land. "People's Edition." W. and R. Chambers.

a printing-office under the auspices of the pasha. As in the case of Alexandria, the modern Cairo is very different from the ancient city of that name, erected by the caliphs in the middle ages. It is a walled town, built in a picturesque eastern style, and is the seat of the court of Mehemet Ali, whose palaces are very extensive. The population of Cairo amounts to about 240,000, but with that of the environs it amounts to half a million.

A considerable traffic and retail trade are carried on in the town, and the place is distinguished as a seat of Arabic learning and Mohammedan theology. There are several splendid mosques, to which schools are attached.

There is now an English hotel, and an Italian locanda or lodging-house, in which European travellers reside. The town is now also under a strict police, established by Mehemet Ali, and all Europeans, in whatsoever costume, are perfectly safe from insult or injury. Old Cairo, the original town near this spot, and called by the natives Mezr-Anteekeh, is a suburb at the distance of two miles on the banks of the river, the intervening grounds being laid out in gardens and plantations. This ancient seat of population, which is now partially in ruins, and made a place of temporary summer resort by the citizens of Cairo, is believed to be as old as the sojourn of the Israelites in Egypt, and a house in it is shown as that in which the Virgin Mary lodged after she had fled into the country from Palestine. The modern town is said to have been erected in the year 980, at the Saracenic conquest, and called El Kahira, or the Victory. In the year 1175, it was visited by Saladin, who surrounded it with a wall for defence.

Mr. Stephens's account of his approach to Cairo, in sailing up from Alexandria, conveys a striking idea of the appearance of the city and its environs:—"Towards the evening of the fourth day, we came in sight of the 'world's great wonder,' the eternal pyramids, standing at the head of a long reach of the river directly in front of us, and almost darkening the horizon. The sun was about setting in that cloudless sky known only in Egypt; for a few moments their lofty summits were lighted by a gleam of lurid red; and as the glorious orb settled behind the mountains of the Libyan Desert, the atmosphere became dark and more indistinct, and their clear outline continued to be seen after the whole earth was shrouded in gloom. The next morning at seven o'clock we were alongside the Island of Rhoda, as the Arab boatmen called it, where the daughter of Pharaoh came down to bathe, and found the little Moses. We crossed over in a small boat to Boulac, the harbour of Cairo, breakfasted with Mr. T——, the brother-in-law of my friend, an engineer in the pasha's service, whose interesting wife is the only English lady there; and, mounting a donkey, in half an hour I was within the walls of Grand Cairo. The traveller who goes there with the reminiscences of Arabian tales hanging about him, will nowhere see the Cairo of the caliphs; but before arriving there he will have seen a curious and striking spectacle. He will have seen, streaming from the gate among loaded camels and dromedaries, the dashing Turk, with his glittering sabre, the wily Greek, the grave Armenian, and the despised Jew, with their long silk robes, their turbans, solemn beards, and various and striking costumes; he will have seen the harem of more than one rich Turk, eight or ten women on horseback, completely enveloped in large black silk wrappers, perfectly hiding face and person, and preceded by that abomination of the East, a black eunuch; the miserable santon, the Arab saint, with a few scanty rags on his breast and shoulders, the rest of his body perfectly naked; the swarthy Bedouin of the desert, the haughty janizary, with a cocked gun in his hand, dashing furiously through the crowd, and perhaps bearing some bloody mandate of his royal master; and perhaps he will have seen and blushed for his own image in the person of some beggarly Italian refugee. Entering the gate, guarded by Arab soldiers in a bastard European uniform, he will cross a large square filled with officers and soldiers, surrounded by what are called palaces, but seeing nothing that can interest him save the house in which the gallant Kleber, the hero of many a bloody field, died ingloriously by the hands of an assassin. Crossing this square, he will plunge into the narrow streets of Cairo. Winding his doubtful and perilous way among tottering and ruined houses, jostled by camels, dromedaries, horses, and donkeys, perhaps he will draw up against a wall, and, thinking of plague, hold his breath, and screw himself into nothing, while he allows a corpse to pass, followed by a long train of howling women, dressed in black, with masks over their faces; and entering the large wooden gate which shuts in the Frank quarter for protection against any sudden burst of popular fury, and seating himself in a miserable Italian locanda, he will ask himself, Where is the 'Cairo of the caliphs, the superb town, the holy city, the delight of the imagination, greatest among the great, whose splendour and opulence made the prophet smile?'

"One of my first rambles in Cairo was to the slave-market. It is situated nearly in the centre of the city, as it appeared to me, although, after turning half a dozen corners in the narrow streets of a Turkish city, I will defy a man to tell where he is exactly. It is a large old building, enclosing a hollow square, with chambers all around, both above and below. There were probably 500 or 600 slaves, sitting on mats in groups of ten, twenty, or thirty, each belonging to a different proprietor. Most of them were entirely naked; though some, whose shivering forms evinced that even there they felt the want of their native burning sun, were covered with blankets. They were mostly from Dongola and Sennaar; but some were Abyssinians, with yellow complexion, fine eyes and teeth, and decidedly handsome. The Nubians were very dark, but with oval, regularly formed and handsome faces, mild and amiable expressions, and no mark of the African except the colour of their skin. The worst spectacle in the bazaar was that of several lots of sick, who were separated from the rest, and arranged on mats by themselves; their bodies thin and shrunken, their chins resting upon their knees, their long lank arms hanging helplessly by their sides, their faces haggard, their eyes fixed with a painful vacancy, and altogether presenting the image of man in his most abject condition. Meeting them on their native sands, their crouching attitudes, shrunken jaws, and rolling eyes, might have led one to mistake them for those hideous animals the orang-outang and ape. Prices vary from twenty to a hundred dollars; but the sick, as carrying within them the seeds of probable death, are coolly offered for almost nothing, as so much damaged merchandise which the seller is anxious to dispose of before it becomes utterly worthless on his hands. There was one, an Abyssinian, who had mind as well as beauty in her face; she was dressed in silk, and wore ornaments of gold and shells, and called me as I passed, and peeped from behind a curtain, smiling and coquetting, and wept and pouted when I went away; and she thrust out her tongue to show me that she was not like those I had just been looking at, but that her young blood ran pure and healthy in her veins.

Cairo is surrounded by a wall; the sands of the desert approach it on every side, and every gate, except that of Boulac, opens to a sandy waste. Passing out by the Victory Gate, the contrast between light and darkness is not greater than between the crowded streets and the stillness of the desert, separated from them only by a wall. Immediately without commences the great burial-place of the city. Among thousands and tens of thousands of Mussulmans' headstones, I searched in vain for the tomb of the lamented Burckhardt; there is no mark to distinguish the grave of the enterprising traveller from that of an Arabian camel-driver. At a short distance

from the gate are the tombs of the caliphs, large and beautiful buildings, monuments of the taste and skill of the Saracens. From hence, passing around outside the walls, I entered by the gate of the Citadel, where I saw what goes by the name of Joseph's Well, perhaps better known as the Well of Saladin. It is 45 feet wide at the mouth, and cut 270 feet deep through the solid rock, to a spring of saltish water, on a level with the Nile, whence the water is raised in buckets on a wheel, turned by a buffalo."

PYRAMIDS OF GIZEH.

"Almost from the gates of Cairo (continues this writer) the pyramids are constantly in sight, and after crossing the ferry, we rode towards them. Approaching, the three great pyramids and one small one are in view, towering higher and higher above the plain. I thought I was just upon them, and that I could almost touch them; yet I was more than a mile distant. The nearer I approached, the more their gigantic dimensions grew upon me, until, when I actually reached them, rode up to the first layer of stones, and saw how very small I was, and looked up their sloping sides to the lofty summits, they seemed to have grown to the size of mountains. The base of the great pyramid of Cheops is about 800 feet square, covering a surface of about eleven acres, according to the best measurement, and 461 feet high [being 117 feet higher than St. Paul's at London]. Even as I walked around it, and looked up at it from the base, I did not feel its immensity until I commenced ascending; then, having climbed some distance up, when I stopped to breathe and look down upon my friend below, who was dwindled into insect size, and up at the great distance between me and the summit, then I realized in all their force the huge dimensions of this giant work. It took me twenty minutes to mount to the summit; about the same time that it had required to mount the cones of Ætna and Vesuvius. The ascent is not particularly difficult, at least with the assistance of the Arabs. There are 206 tiers of stone, from one to four feet in height, each two or three feet smaller than the one below, making what are called the steps. Very often the steps were so high that I could not reach them with my feet. Indeed, for the most part, I was obliged to climb with my knees, deriving great assistance from the step which one Arab made for me with his knee, and the helping hand of another above.

"It is not what it once was to go to the pyramids. They have become regular lions for the multitudes of travellers; but still, common as the journey has become, no man can stand on the top of the great pyramid of Cheops, and look out upon the dark mountains of Mokattam bordering the Arabian desert; upon the ancient city of the Pharaohs, its domes, its mosques, and minarets, glittering in the light of a vertical sun; upon the rich valley of the Nile, and the 'river of Egypt' rolling at his feet; the grand range of pyramids and tombs extending along the edge of the desert to the ruined city of Memphis, and the boundless and eternal sands of Africa, without considering that moment an epoch not to be forgotten. Thousands of years roll through his mind, and thought recalls the men who built them, their mysterious uses, the poets, historians, philosophers, and warriors, who have gazed upon them with wonder like his own."

On the summit is an area, about thirty feet square, consisting of six square blocks of stone irregularly disposed. Six millions of tons of stones are supposed to have been employed in the construction of the pyramid, and 100,000 men for twenty years are said to have been engaged in the erection of this the most stupendous mass of masonry in the world. The four angles of the pyramid correspond with the four points of the compass. The mass of the pyramid is not altogether solid. An entrance has been made, by which a series of labyrinthine passages and chambers have been discovered. "The entrance (says Stephens) is on the north side. The sands of the desert have encroached upon it, and, with the fallen stones and rubbish, have buried it to the sixteenth step. Climbing over this rubbish, the entrance is reached, a narrow passage three and a half feet square, lined with broad blocks of polished granite, descending in the interior at an angle of twenty-seven degrees for about ninety-two feet; then the passage turns to the right, and winds upwards to a steep ascent of eight or nine feet, and then falls into the natural passage, which is five feet high and one hundred feet long, forming a continued ascent to a sort of landing-place; in a small recess of this is the orifice or shaft called the well. Moving onward through a long passage, the explorer comes to what is called the Queen's Chambers, seventeen feet long, fourteen wide, and twelve high. I entered a hole opening from this crypt, and crawling on my hands and knees, came to a larger opening, not a regular chamber, and now cumbered with fallen stones. Immediately above this, ascending by an inclined plane lined with highly polished granite, and about 120 feet in length, and mounting a short space by means of holes cut in the sides, I entered the King's Chamber, about thirty-seven feet long, seventeen feet wide, and twenty feet high. The walls of the chamber are of red granite, highly polished, each stone reaching from the floor to the ceiling; and the ceiling is formed of nine large slabs of polished granite, extending from wall to wall. It is not the least interesting part of a visit to the interior of the pyramids, as you are groping your way after your Arab guide, to feel your hand running along the sides of an enormous shaft, smooth and polished as the finest marble, and to see by the light of the flaring torch chambers of red granite from the Cataracts of the Nile, the immense blocks standing around and above you, smooth and beautifully polished in places, where, if our notions of the pyramids be true, they were intended but for few mortal eyes. At one end of the chamber stands a sarcophagus, also of red granite; its length is seven feet six inches, depth three and a half, breadth three feet three inches. Here is supposed to have slept one of the great rulers of the earth, the king of the then greatest kingdom of the world, the proud mortal for whom this mighty structure was raised. Where is he now? Even his dry bones are gone, torn away by rude hands, and scattered by the winds of heaven. The interior of the pyramid is excessively hot, particularly when surrounded by a number of Arabs and flaring torches." To this account it may be added, that there is a well in the pyramid which is referred to by the Roman historian Pliny, as being eighty-six cubits in depth. It has been descended by a few enterprising travellers.

In one of the chambers of the great pyramid the annexed figure with hieroglyphics has been discovered; the hieroglyphics signify the word "Seamphis," the name of the builder, as it is believed, who lived about 2120 years before Christ.

To the celebrated Belzoni we are indebted for a knowledge of the interior of the pyramid of Cephrenes, brother and successor of Cheops, but any detail of his labours

would carry us far beyond our limits. Suffice it to say, that they were directed with remarkable skill, and a perseverance which no obstruction could arrest. It stands upon a rather higher elevation than that of Cheops, and is built of the same species of limestone, and jointed with the same kind of cement. Its base is 684 feet, and its height 456. The steps are much splintered and broken, but it can be ascended to a certain extent on the southern side without great difficulty. The opening of this pyramid presents to us a striking instance of discrimination and tact. Herodotus had declared that it contained no chambers, and modern travellers had taken this report for granted. The practised eye of Belzoni, however, detected certain indications of an entrance, and, after many days of labour upon the hard stone, he found himself at last in a chamber hewn out of the solid rock, from the floor to the roof, which last is of the same stone as the pyramid itself. In the sarcophagus were the bones of an animal, very generally supposed to be those of a sacred bull, an object of veneration among the ancient Egyptians. On the wall at the west end of the chamber he perceived an Arabic inscription, from which it has been inferred that the two larger pyramids had been explored, at the distance of many years, by some of the caliphs. The third large pyramid is that of Mycerinus; but it is much less, and not so important an object as the others. There is also a fourth large pyramid, although travellers are in the habit of speaking of the pyramids of Gizeh as only three in number. Those of Sakhara appear to be a continuation of the great cemetery to which those of Gizeh belong. Two of them only are very large, and they are all more dilapidated than those we have described; hence, a higher antiquity has been ascribed to them. With regard to the other Egyptian pyramids, they are, in their leading characters, nearly similar to those described, and the end for which they were constructed we infer was the same—that of receptacles for the dead, and chiefly for the bodies of kings and other royal personages. Some maintain that they were consecrated to the sun, others that they were used for astronomical observations, others for transmitting historical information, and so on.

Numerous ruined edifices and tumuli lie scattered about among the pyramids, and extend north and south along the left bank of the Nile as far as the eye can reach. The stone buildings supposed to be mausoleums, are generally of an oblong form, having their walls slightly inclined from the perpendicular inwards, the peculiar characteristic of ancient Egyptian architecture; flat-roofed, with a sort of parapet round the outside, formed of stones; rounded at the top, and rising about a foot above the level of the terrace. The walls are constructed of large masses of stone of irregular shape. The various chambers of these edifices were found to be profusely embellished with sculptures and bas-relief paintings, many of which were spirited and beautiful. In one of them were found the remains of several mummies, and in another the fragments of a figure as large as life. An important circumstance remains to be noticed. In each of these edifices there was discovered a well, from the bottom of which a passage led to a subterranean chamber. Caviglia cleared out one of these shafts, which was sixty feet deep; and in the chamber he found a plain but highly finished sarcophagus, nearly of similar dimensions with that in the pyramid of Cheops. This supplies a strong argument in favour of the hypothesis that the pyramids are tombs.

By far the most brilliant of Mr. Caviglia's discoveries, are those to which he was led in the laborious task of uncovering the great sphinx in front of the pyramid of Cephrenes. On the stone platform on the foreground, and centrally between the outstretched paws of the sphinx, was discovered a large block of granite which fronted east, and was highly embellished with sculpture in bas-relief. Two other tablets of calcareous stone, similarly ornamented, were supposed, with that of granite, to have constituted part of a temple, by being placed one on each side of the latter, and at right angles to it. One of them, in fact, was still remaining in its place. Of the other, which was thrown down and broken, the fragments are now in the British Museum. A small lion couchant, in front of this edifice, had its eyes directed towards the sphinx. There were, besides, several fragments of other lions, rudely carved, and the fore part of a sphinx, of tolerable workmanship. In front of the temple was a granite altar, with one of the four "horns" still retaining its place at the angle. From the effects of fire evident on the stone, this altar, it would seem, had been used for burnt-offerings. Inscriptions were found upon the digits of the paws, but of no moment.

Like every thing else in Egypt, this singular monument has been the subject of very opposite representation. The general accuracy of Dr. Richardson induces us to lay his account of it before the reader. "The breast, shoulders, and neck, which are those of a human being, remain uncovered; as also the back, which is that of a lion. The neck is very much eroded, and, to a person near the head, seems as if it were too heavy for its support. The head-dress has the appearance of an old-fashioned wig, projecting out about the ears like the hair of the Berberi Arabs; the ears project considerably; the nose is broken; the whole face has been painted red, which is the colour assigned to the ancient inhabitants of Egypt, and to all the deities of the country except Osiris. The features are Nubian, or what from ancient representation may be called ancient Egyptian, which is quite different from the negro feature. The expression is particularly placid and benign, so much so that the worshipper of the sphinx might hold up his god as superior to all the other gods of wood and stone which the blinded nations worshipped." As to the dimensions of the sphinx, the stretch of the back is about 120 feet, and from the top of the head to the base of the reclining figure about 40 feet. Such has been the drifting of the sands, that the whole figure is now covered, except the head and a portion of the dilapidated neck, as seen in the annexed cut. The French uncovered a part of the figure, but the sands have again drifted it up.

A few miles above the pyramids of Gizeh once stood Memphis, a city as large and flourishing as Alexandria, but now utterly destroyed, and the very ruins hardly distinguishable.

DISTRICT ABOVE CAIRO.

Pursuing the course of the Nile upwards, and passing various villages and ruined structures, the first place of importance which occurs is Beni Soueff, situated on the left bank in one of the richest and most extensive tracts

of corn land in Egypt, at the distance of 114 miles above Cairo. Penetrating a pass of the sylvan chain of mountains, at about fifteen miles west-south-west of this town, we enter the district of Fayoum. Medinet-el-Fayoum, the capital, is situated in lat. 29° 20′ north, long. 31° 1′ 30″ east, built from the materials, and partly on the site, of the ancient Crocodilopolis, the name of which was changed to Arsinöe, by Ptolemy Philadelphus, in honour of his sister. It contains about 5000 inhabitants, chiefly Moslems, with the usual proportion of mosques and baths. A canal from the Bahr Yousuf divides it into two parts, which are connected by five bridges. The principal remains of the ancient city lie to the north of the present town, occupying an area nearly two miles and a half from north to south, and two miles from east to west. Among the ruins are numerous fragments of statues, obelisks, &c. The town of Arsinöe was one of the most celebrated in Egypt, and so late as the time of the Romans contained a flourishing population. Fayoum is still reckoned the most productive part of Egypt, and all the country as far as Lake Mœris is well cultivated. This celebrated lake was of artificial formation in ancient times, and extended to several hundreds of miles in circumference. It was connected by canals with the Nile. Continuing the route up the Nile, at the distance of about seventy miles we arrive on the same or western bank, at a considerable village called Al Rairamoun, where Ali Pacha has established a sugar manufactory and a distillery. In the environs are extensive sugar plantations, and there is a saltpetre manufactory in the neighbourhood. About six miles to the south-west of this place are the remains of Hermopolis, an ancient town, whose representative is a large village called Oshmuncin. About a league to the south of it is the large and well-built town of Mellane; and ten leagues farther on, and near the western shore, that of Manfaloot, anciently a place of great trade. It is a sort of capital, and the see of a Coptic bishop. The adjacent country is very fertile, particularly in fruits. About two leagues farther up, on the eastern side of the river, are several pits, in which are deposited the mummies of crocodiles. But we have now entered the Said, or Upper Egypt, which properly begins with Manfaloot, which is a sort of frontier town on the left bank. The valley of the Nile is in this part about eight miles from mountain to mountain, and, above Manfaloot, a cultivated place, commences on the eastern side of the river. For many miles the left bank of the river is perforated with excavations, which, however, have not been explored.

DENDERA.

Proceeding upwards beyond Manfaloot, we pass in the distance of eighty or ninety miles various towns of less or more importance; among others, Siout and Girzah on the left, and the ruins of Ekhim on the right bank. On the face of a range of mountains near Siout, is a long range of tombs, the burial-place of ancient Egyptians, excavated as chambers in the solid rock, and still ornamented in their ceilings with coloured paintings of old date, and which, like other remains of art, have been preserved by the extreme dryness of the climate. These, and all other objects, however, are of inferior interest to those which begin to be disclosed on approaching a bend of the river near the 26th degree of north latitude. Here the view opens of the magnificent ruins of the temple of Dendera, and some miles farther on those of Thebes.

The ruins of Dendera are more than a mile in length, and half a mile in breadth. The grand object of interest is the temple, a very celebrated ruin, which, if cleared from rubbish, would present a front of 160 feet, with a height of 60 feet. The principal propylon—or, as we might call it, the gateway of the approach—is a truly magnificent object, forming a tall block of columnar architecture, covered with the most exquisite sculpture and hieroglyphics. The sculptured figures on the dilapidated walls of the temple bendings are equally beautiful. Some idea of the grandeur of these ruins may be gathered from the circumstance recorded of the French army during its campaign in Egypt. When the soldiers first beheld the ruins, they were so overpowered with their gigantic size and extraordinary beauty, that they exclaimed, as with the heart and voice of one man, such a sight more than repaid them for all the sufferings and dangers of the war. It is supposed to have been consecrated to the worship of Isis, who was the principal deity in the Egyptian Pantheon. The temple itself still retains all its original magnificence. Time has only rendered it more venerable and imposing in appearance.

THEBES.

Thebes, once the capital of Upper Egypt, and the most splendid city in the world, no longer exists; its site can now only be traced in four petty villages, Luxor, Karnac, Medinet Abou, and Gornoo, on both banks of the river—distance from the sea 850 miles. Thebes is famous as "the city of a hundred gates," the theme and admiration of ancient poets and historians, the wonder of travellers—"that venerable city," as Pocock eloquently remarks, "the date of whose destruction is older than the foundation of other cities, and the extent of whose ruins, and the immensity of whose colossal fragments, still offer so many astonishing objects, that one is rivetted to the spot, unable to decide whither to direct the step or fix the attention." These ruins extend about eight miles along the Nile, from each bank to the sides of the enclosing mountain, and describe a circuit of twenty-seven miles. The most remarkable objects on the eastern side are the temples of Karnac and Luxor; and on the western are the Memnonium, or palace of Memnon, two colossal statues, the sepulchres of the kings, and the temple of Medinet Abou. Almost the whole extent of eight miles along the river is covered with magnificent portals, obelisks decorated with the most beautiful sculpture, forests of columns, and long avenues of colossal statues. The largest of these temples, and of any in Egypt, is that at Karnac, on the site of the ancient Diospolis.

With respect to the magnificence and beauty of its several parts, this temple has been pronounced as having no parallel in the whole world. It has twelve principal entrances, each of which is composed of several propyla and colossal gateways, besides other buildings attached to them, in themselves larger than most other temples. The sides of some of these are equal to the bases of the greater number of the pyramids in Middle Egypt. One of the propyla is entirely of granite, adorned with the most finished hieroglyphics, and many of them have been furnished with colossal statues. The avenues of sphinxes that lead in several directions to the propyla, one of which was continued the whole way across the plain to the temple at Luxor, nearly two miles distant, correspond to the magnificence of the principal structure; and the body of the temple, which is preceded by a large court, consists of a prodigious hall or portico, the roof of which is supported by 134 columns, some 26, others 34 feet in circumference; four beautiful obelisks mark the entrance to the shrine, which consists of three apartments, built entirely of granite. The dimensions of this great edifice are about 1200 feet in length, and 420 in width. But the principal fane, grand and imposing as it is, sinks into nothing when compared with the extent and number of the buildings which surround it; the prodigious gateways of polished granite, covered with sculpture, and adorned with colossal statues; the subordinate temples which anywhere else

would be esteemed magnificent piles; and the avenues, which approach it from almost every point of the compass, miles in length, and guarded by rows of sphinxes of vast size, cut out of single blocks of syenite. The field of ruins at Karnac is about a mile in diameter. Probably the whole of the space was once, in the prouder days of Thebes, consecrated entirely to the use of the temple.

About a mile and a quarter above Karnac, are the village and temple of Luxor. This temple, though not of such vast dimensions as that of Karnac, is in a superior style of architecture, and in more complete preservation. The entrance is thought to surpass every thing else that Egypt presents, and the two obelisks are considered the finest in the world. But the objects which most attract attention are the sculptures which cover the east wing of the northern front. They contain, on a great scale, a representation of a victory gained by one of the ancient kings of Egypt over their Asiatic enemies. The number of human figures introduced amounts to 1500—500 on foot, and 1000 in chariots.

The disposition of the figures, and the execution of the whole picture, are equally remarkable, and far surpass all preconceived ideas of the state of art at the remote era to which we must attribute them. After passing several gateways, we enter what is conjectured to be the palace of the great Osymandyas. These ruins of Luxor and Karnac represent only one half of ancient Thebes. The temples of Medinet Abou are also splendid, and upon a grand scale. It was so placed as to be exactly opposite to that of Luxor, on the other side of the Nile, where the magnificent structure at Karnac was fronted by the Memnonium or temple of Dair; and hence all these grand objects formed so many stages or prominent points in the religious processions of the priests. Though the tabernacle of Jupiter dwelt at Karnac, the proper Diospolis, yet it was carried over the river every year, and remained a few days in Libya; and we find, from a general estimate, that there was a space of between nine and ten miles over which they might exhibit the pomp and parade of their superstition, both going and returning. Almost every part of the road through this immense theatre was lined with sphinxes, statues, propyla, and other objects calculated to inflame the ardour of devotion.

The Memnonium deserves particular notice. This celebrated relic of antiquity, the palace of king Memnon, or of the Pharaohs, faces the east, and is fronted with a stupendous propylon, of which 234 feet of its length are still remaining.

Every stone in the propylon appears to have been shaken and loosened, as if from the concussion of an earthquake. The passages which conduct to the chambers are so broken and filled up, as hardly to admit of examination. The walls are in various parts ornamented with sculptures, and other pictorial devices. One of the most striking is a battle scene. The various situations of victors and vanquished are represented in a very lively manner, and the whole sculpture, though but roughly executed, is full of fire. In the Memnonium there is still to be seen the statue of Osymandyas, or Sesostris, which is allowed to be the finest relic of art which the place contains, although shattered and broken. It is about twenty-six feet broad between the shoulders, fifty-four feet round the chest, and thirteen feet from the shoulder to the elbow. There are on the back hieroglyphical tablets, extremely well executed, which identify this enormous statue with the hero whose achievements were sculptured on the walls of the temple.

The above figure has sometimes been confounded with that of Memnon, so long celebrated for its vocal qualities. The latter, however, is one of the two statues usually called Shamy and Damy, which stand at a little distance from Medinet Abou, in the direction of the Nile. These, we are told, are about fifty-two feet in height. They rest on thrones, which are respectively thirty feet long, eighteen broad, and between seven and eight high. They are placed about forty feet asunder, are in a line with each other, and look towards the east,

directly opposite to the temple of Luxor. The southern one appears to be of one entire stone. The face, arms, and front of the body, have suffered so much, that not a feature of the countenance remains. The head-dress is beautifully wrought, as also the shoulders, which, with the back, are uninjured. The massy hair projects from behind the ears like that of the sphinx. The sides of the throne are highly ornamented with elegant devices. The colossus is in a sitting posture, with the hands resting upon the knees.

The gigantic statue which is placed on the north side, would appear, from various circumstances, to be that of the vocal Memnon, who was said to play a lively strain when the sun rose, and a melancholy one when he set. It presents the same attitude as its companion. These statues are placed on either side of an avenue leading to a place of worship, and evidently were followed by a series of other colossal figures, as the remains of some of them are still visible.

"The rambler among the ruins of Thebes (observes Mr. Stephens) will often ask himself, 'Where are the palaces of the kings, and princes, and people, who worshipped in these mighty temples?' With the devout spirit of religion that possessed the Egyptians, they seem to have paid but little regard to their earthly habitations, their temples and their tombs were the principal objects that engrossed the thoughts of this extraordinary people. It has been well said of them that they regarded the habitations of the living merely as temporary resting-places, while the tombs were regarded as permanent and eternal mansions; and while not a vestige of a habitation is to be seen, the tombs remain monuments of splendour and magnificence, perhaps even more wonderful than the ruins of their temples. The whole mountain-side on the western bank of the river is one vast necropolis. The open doors of tombs are seen in long ranges, and at different elevations, and on the plain large pits have been opened, in which have been found 1000 mummies at a time. For many years, and until a late order of the pasha preventing it, the Arabs have been in the habit of rifling the tombs to sell the mummies to travellers. Thousands have been torn from the places where pious hands had laid them, and the bones meet the traveller at every step. The Arabs use the mummy-cases for firewood, the bituminous matters used in the embalmment being well adapted to ignition; and the epicurean traveller may cook his breakfast with the coffin of a king. Notwithstanding the depredations that have been committed, the mummies that have been taken

away and scattered all over the world, those that have been burnt, and others that now remain in fragments around the tombs, the numbers yet undisturbed are no doubt infinitely greater; for the practice of embalming is known to have existed from the earliest periods recorded in the history of Egypt; and by a rough computation, founded upon the age, the population of the city, and the average duration of human life, it is supposed that there are from 8,000,000 to 10,000,000 of mummied bodies in the vast necropolis of Thebes.

Amid the wrecks of former greatness which tower above the plain of Thebes, the inhabitants who now hover around the site of the ancient city are perhaps the most miserable in Egypt. On one side of the river they build their mud huts around the ruins of the temples, and on the other their best habitations are in the tombs; wherever a small space has been cleared out, the inhabitants crawl in, with their dogs, goats, sheep, women, and children; and the Arab is passing rich who has for his sleeping place the sarcophagus of an ancient Egyptian."

Mr. Stephens, in the above quotation, inquires, "Where are the residences of the kings, princes, and people of ancient Egypt?" These are entirely gone. They were built of brick, and have long since been utterly destroyed, or buried in fragments beneath the drifting sands of the desert, or the accumulations from the Nile. The temples and pyramids having been erected of a stupendous size and of a solid material, have survived, while all the ordinary habitations of the people have disappeared.

EDFOU, ELEPHANTINA, PHILÖE.

The magnificent ruins of Thebes are not by any means the last object of interest in ascending the river. Passing Esneh, a town on the left bank, and an emporium of the trade with Abyssinia, we reach on the same side of the river, at about the distance of fifty miles from Thebes, the town of Edfou, composed as usual of a parcel of mud houses, bazaars, and a mosque. "At one corner of this miserable place (says Mr. Stephens) stands one of the magnificent temples of the Nile. The propylon, its lofty proportions enlarged by the light of the moon, was the most grand and imposing portal I saw in Egypt. From a base of nearly 100 feet in length and 30 in breadth, it rises on each side the gate in the form of a truncated pyramid, to the height of 100 feet, gradually narrowing, till at the top it measures 75 feet in length and 18 in breadth. Judge, then, what was the

temple to which this formed merely the entrance; and this was far from being one of the large temples of Egypt It measured, however, 440 feet in length and 220 in breadth, about equal to the whole space occupied by St. Paul's Churchyard. Its dromos, pronaos, columns and capitals, all correspond, and enclosing it is a high wall, still in a state of perfect preservation I walked round it twice, and, by means of the wall erected to exclude the unhallowed gaze of the stranger, I looked down upon the interior of the temple. Built by the Egyptians for the highest uses to which a building could be dedicated, for the worship of their gods, it is now used by the pasha as a granary and storehouse."

Fifty miles farther up we reach the boundary of Egypt and Nubia, at the town of Assouan or Syene. It is situated in lat. 24° 5′ 23″ north, long. 32° 54′ 49″ east. Its natural position, so well adapted for a frontier town, has rendered it at all times a place of importance. It was formerly a bishopric, but no Christians are now found here. Ruined churches and convents strike the eye of the traveller, but the Christian faith is unknown. Not only is it the last town in Egypt, but it is the last place in this direction in which the Arabic is spoken as the vernacular tongue. Here occurs the first Egyptian cataract in descending the Nile.

The present town of Assouan has been built a little to the north of a former town of Saracenic origin, the ruins of which are seen above it, and which was itself built upon the ruins of a Roman city. The whole town is encompassed with vestiges of buildings; the most interesting are about the old town, which occupies a strong and commanding position; the walls still remain, and though slight and of sun-dried brick, are very entire. They are flanked with towers at unequal distances. Many of the walls of the houses are also standing, but they are all unroofed. From the interior of many of them, passages lead down to the chambers of houses belonging to the ancient city, which are now under ground; of the old town a few insignificant ruins are all the remains.

Below the cataracts at this place occurs the small island of Elephantina, or, as it is called by the Arabs, Djeziret-zel-zabir, the flowery island; it is about 2000 feet in length, and 600 feet in breadth. The northern end is low and alluvial, well cultivated, and shaded with palm-trees. Here are the ruins of Roman fortifications, opposite to which, on the eastern bank of the Nile, are remains of Arabian works. There is an ancient quarry, from which large columns have been excavated; the marks of the workman's chisel and wedge are as fresh as if they were of yesterday. Some are lying blocked out and partly wrought, and a large sarcophagus is two-thirds cut out of the rock. There are a number of architectural remains, sculptures, and hieroglyphical tablets. This beautiful island is inhabited by Nubians, who are perfectly black, without having any resemblance in their features to the negro.

Above the cataracts, at the distance of about six miles south from Assouan, is the far more interesting though smaller island of Philöe, or Djeziret-el-birba, meaning the Temple island. "This island is entirely covered with temples in large groups, and in a high state of preservation; and from a rocky eminence at its southern extremity the whole of the ruins may be seen at once. On the south-west side are two large temples, adorned and connected by long colonnades, but manifestly of different ages; on the right is the small Temple of Isis with an isolated unfinished building, having no remains of the cella, nor any appearance of an interior cornice; and on the left are an obelisk, and long porticoes leading to a large temple of Isis, near a smaller one dedicated to Hathor or the Egyptian Venus, which Champolion has pronounced the best in the island. The great Temple of Isis, which is the southernmost of all, has two colossal pyramidal propyla. None of the existing monuments of Egypt is better calculated to convey an adequate idea of the magnificence by which they are characterized, than the portico of this temple, which consists of twelve

columns, four in front and three deep. The capitals, which are in pure Egyptian taste, represent varied forms and compositions of the palm branch, the domm leaf, and the lotus. These, as well as the sculptures on the columns, the ceiling, and the walls, have been painted in the most vivid colours, which still retain much of their original brightness. At the northern extremity of the island there are the remains of a triumphal arch, and other works of Roman architecture; and on the north-east side an unfinished temple, exhibiting many peculiarities of structure, and showing that the arts were not always stationary in Egypt. In a word, within the compass of this little island, Nubian cabins, Arab huts, Christian chapels, Roman fortifications and Egyptian temples, are crowded together in such a manner as to produce a painful sense of the lapse of ages, the transitory nature of empires, and the destructibility of human works, however colossal in magnitude or solid in construction."*

ETHIOPIA.

Few travellers proceed farther up the Nile than Philoe, as the journey through Nubia is less safe or agreeable than that within the Egyptian territory. Yet without a visit to the Nubian valley of the Nile, which extends to near the head branches of the river in Abyssinia, much of the ancient grandeur of this part of the world will remain unexplored. Nubia, which is at present a Turkish province subject to the pasha of Egypt, is frequently called by the name Ethiopia, from the black complexion of whose inhabitants the term Ethiopian came in early times to signify one who is black, or a negro. This country of Nubia, or Ethiopia, is understood by some historians to have enjoyed a degree of civilization and refinement in art, at a date even earlier than Egypt; and till the present day it possesses pyramids and other monuments of architectural skill, as wonderful, in the eyes of the traveller, as those in the lower divisions of the Nile.

One of the latest travellers who penetrated to this inner Ethiopian region, was Mr. G. A. Hoskins, who in 1835 published a large volume descriptive of his journey. At about the 17th degree of north latitude, he reached Meroe, an island formed by the forking of two upper branches of the Nile. This island is between three and four hundred miles long, and contains several distinct groups of pyramidal structures of extraordinary magnificence, but greatly damaged by the hand of barbarians; also some traces of the remains of the city of Meroe, once the capital of Ethiopia. "Never (says Mr. Hoskins) were my feelings more ardently excited than in approaching, after so tedious a journey, to this magnificent necropolis. The appearance of the pyramids, in the distance, announced their importance; but I was gratified beyond my most sanguine expectations when I found myself in the midst of them. The pyramids of Gizeh are magnificent, wonderful from their stupendous magnitude; but for picturesque effect and elegance of architectural design, I infinitely prefer those of Meroe. I expected to find few such remains here, and certainly nothing so imposing, so interesting, as these sepulchres, doubtless of the kings and queens of Ethiopia. I stood for some time lost in admiration. From every point of view I saw magnificent groups, pyramid rising behind pyramid, while the dilapidated state of many did not render them less interesting, though less beautiful as works of art. I easily restored them in my imagination; and these effects of the ravages of time carried back my thoughts to more distant ages. The porticoes on the east side of each pyramid soon attracted my attention, and I passed eagerly from one to the other, delighted to find in several of them monuments of sculpture and hieroglyphics, which, few as they are, have, I trust, given us the assurance of the locality, and will, I hope, throw some light upon the mythology and arts of the Ethiopians. There are the remains and traces of eighty of these pyramids; they consist chiefly of three groups. The principal and most imposing, at which I arrived first, is situated on a hill, two miles and a half from the river, commanding an extensive view of the plain. There are thirty-one pyramids in this group, of which the plans of twenty-three may be traced; while to the south-east is another group of thirteen, in some degree of preservation. There are three other groups, two consisting of two pyramids each, and the other of six; and at 5600 feet to the west of the chief group, may be traced the remains of twenty-five pyramids, but almost buried."

After mentioning the appearance and minor details of these remarkable structures, this author continues—"I have carefully described this interesting and magnificent cemetery; but how shall I attempt to express the feelings of the traveller on treading such hallowed ground? One who, in passionate admiration for the arts, had visited the chief galleries of Europe, gazed upon the breathing image of divinity in the Apollo of the Vatican, or the deep expression of the most poetical of statues, the Dying Gladiator of the Capitol; who had beheld and felt the pictorial creations of a Raphael and a Correggio, and, with delight, contemplated Grecian, Roman, and modern sculpture, could not be unmoved at finding himself on the site of the very metropolis where those arts had their origin. The traveller who has seen the architectural antiquities of Rome, and has admired the magnificent use that nation has made of the arch, making it the chief ornament of their baths, palaces, and temples, would be further deeply interested at finding here the origin of that discovery. These emotions would be felt with peculiar force by one who, like myself, had been fortunate enough to trace art through her earliest creations—from the splendid Gothic edifices of the north to the ruins of the eternal city—from Rome to Magna Græcia—from the magnificent temple of Neptune at Pæstum, to the still purer antiquities of Sicily, particularly at Girgenti, where nature and art seem to have vied with each other—from that interesting island to the Morea and the city of Minerva, where the knowledge of the arts, sown in the most genial soil, produced the perfection of elegance, chasteness, and magnificence. But the seeds of the knowledge of the Greeks were derived from Egypt; and the Egyptians received their civilization from the Ethiopians and from Meroe, where I now am writing. The beautiful sepulchres of that city afford satisfactory evidence of the correctness of the historical records. Where a taste for the arts had reached to such perfection, we may rest assured that other intellectual pursuits were not neglected, nor the sciences entirely unknown. Now, however, her schools are closed for ever, without a vestige of them remaining. Of the houses of her philosophers, not a stone rests upon another; and where civilization and learning once reigned, ignorance and barbarism have resumed the sway.

"These pyramids are of sandstone, the quarries of which are in the range of hills to the east. The stone is rather softer than the Egyptian, which, added to the great antiquity, may account for the very dilapidated state of most of these ruins, and also for the sculpture and hieroglyphics being so defaced. Time, and the burning rays of a tropical sun, have given them a brownish-red tint, in some parts nearly black. As the operation of many ages is required to make this change on a light-coloured sandstone, a further proof is afforded of the great antiquity of the monuments. The stones being small, and easily removed, it is fortunate that the chief group of pyramids is so far distant from the Nile; otherwise, like those on the plain, near the river, a great proportion of them might have been carried away as materials for the erection of more modern edifices.

* Encyclopædia Britannica, article Egypt.

"This, then, is the necropolis, or city of the dead. But where was Meroe, its temples and palaces? A large space, about 2000 feet in length, and the same distance from the river, strewed with burnt brick and with some fragments of walls, and stones similar to those used in the erection of the pyramids, formed, doubtless, part of that celebrated site. The idea that this is the exact situation of the city, is strengthened by the remark of Strabo, that the walls of the habitations were built of bricks. These indicate, without doubt, the site of that cradle of the arts which distinguish a civilized from a barbarous society. Of the birthplace of the arts and sciences, the wild natives of the adjacent villages have made a miserable burying place: of the city of the learned—'its cloud-capt towers,' its 'gorgeous palaces,' its 'solemn temples,' there is 'left not a rack behind.' The sepulchres alone of her departed kings have fulfilled their destination of surviving the habitations which their philosophy taught them to consider but as inns, and are now fast moulder-ing into dust. As at Memphis, scarcely a trace of a palace or a temple is to be seen. In this once populous plain, I saw the timid gazelles fearlessly pasturing. The hyænas and wolves abound in the neighbouring hills. This morning Signor B. met a man with the head of one which he was carrying in triumph to his village: he said that he had been attacked at once by three small ones when alone, and with no weapon but his lance. The small villages of Bagromeh, south of the ruins, consist of circular cottages with thatched conical roofs. The peasants have numerous flocks, which they send to pasture on the plain. On the banks of the river I observed cotton, dourah, and barley. Such is the present state of Meroe. It is an ample requital for my toilsome journey, to have been the first to bring to England accurate architectural drawings, &c., of all the remains of the ancient capital of Ethiopia, that city which will ever live in the grateful recollection of those who love the arts."*

Returning to Egypt, the description of the country may be concluded by a notice of those fertile districts in the desert at a distance from the Nile, and termed Oases.

THE OASES.

Oasis is a Coptic word signifying an inhabited place, and is usually applied to a fertile spot or island in the midst of a sandy desert. The Oases of Egypt are found at intervals in the middle of that vast plain of arid sand called the Libyan Desert. There are several of them, which are named, according to their size or situation, the Great, Little, Western, Northern, &c.

The Northern, or Oasis of Siwah.—This place, which is about 300 miles distant from Cairo, and about 100 from the Nile, is peculiarly interesting, from its being supposed to enclose the far-famed temple of Jupiter Ammon. The Oasis is about six miles long, and from four to five broad. It is pretty fertile, and contains about 8000 inhabitants. The capital is called Siwah. Besides the splendid remains of the temple, supposed to be that of Jupiter Ammon, are the ruins of other sacred places, and a number of sepulchral excavations.

Great Oasis.—This Oasis is formed of a number of fertile isolated spots, which lie in a line parallel to the course of the Nile, and to the mountains which bound the valley of Egypt on the west. It is about two days' journey from the nearest part of the valley of the Nile. The patches of firm land are separated from one another by deserts of twelve or fourteen hours' walk—so that the whole extent of this Oasis is nearly 100 miles, the greater proportion consisting of a desert. It contains many gardens watered with rivulets, and its palm groves exhibit a perpetual verdure. According to a more recent account, it contains Egyptian ruins covered with hieroglyphic inscriptions. The principal town is called El-Kargeh. Here are the remains of a temple beautifully situated in the midst of a rich grove of palm trees. Near El-Kargeh, there is also a regular necropolis or cemetery, containing 200 or 300 buildings of unburned brick, chiefly of a square shape, and each surmounted by a dome similar to the small mosques erected over the graves of sheiks. At distances of a few miles, some other remains of ancient temples are found. This whole oasis has always been and still is dependent on Egypt. None of the other oases of the desert present us with any object worthy of being dwelt upon.

* Travels in Ethiopia, by G. A. Hoskins, Esq. 1 vol. 4to. London Longman & Company, 1838.

ANCIENT EGYPTIAN SOCIETY AND ART.

The discoveries which have been made in modern times by travellers (chiefly French, Italian, and English) in Egypt, although disclosing the remarkable remains of pyramids, temples, and tombs, which have been above adverted to, do not give any just idea of the grandeur and opulence of the ancient Egyptian dynasties. We learn from Josephus, Diodorus, Herodotus, and other historians, that at one time Egypt and the adjoining provinces under its sway contained 20,000 (some say 30,000) populous cities, and as many as 7,000,000 of inhabitants. At that early period (2300 to 1000 years before Christ) the country was also more fertile, and much less encroached upon by sandy deserts than it now is. Besides depending on its internal resources, it drew great wealth from the territories which it laid under contribution; but its chief source of revenue was in manufacturing industry and commerce. Its artisans excelled in all manner of handicraft employments, and its merchants conducted an export and import traffic on a most extensive scale; in short, Egypt was long the Great Britain of its day—the most industrious and wealthy nation in the world.

It is interesting to know what was the constitution of Egyptian society in these days of ancient glory. It was that of castes similar to what still exists in India. According to the best authorities, the first or chief caste was that of the priests, to whom the king necessarily belonged, as a species of pope or temporal head; the second was composed of the soldiers and agriculturists: the third of the artificers, tradesmen, merchants, builders and professional men; and the fourth consisted of shepherds, fishermen, servants, and all other orders of common people. All the learning of a refined or metaphysical kind was confined to the order of priests, who were of various classes, each following its appointed duty; for example, each deity had its own order of priests. The judges and magistrates were also priests, as likewise were the sacred scribes, the officers who examined and set their seal on the sacrifices, the attirers of the statues of the gods, the keepers of the sacred robes, the doctors, the carriers of the sacred emblems in the processions, the bearers of the small statues, the preservers of the sacred animals, the sprinklers of water in the temples, the embalmers of bodies, the drivers away of flies from the countenances of the gods, and various other functionaries. Thus, the Egyptian priesthood, with the king at their head as a sort of deity, were a formidable body among the people, both from the power with which they were invested and their number; and it need hardly be mentioned that they appropriated to themselves by far the largest share of all the good things with which the land abounded, or which the industry of the nation introduced from foreign countries. The enormous sums which must have been lavished by them in the erection of temples and palaces are beyond all calculation; and when we consider that this vast expenditure went towards the adoration of crocodiles, bulls, dogs, storks, snakes, and other animals, or at least of a tribe of gods whom these creatures were imagined to represent, we are overwhelmed with the magnitude of the superstition, and look upon the ancient Egyptians, with all their

learning, as little advanced on the right road to civilization.

A nation, however, as has been a thousand times proved, may have attained considerable proficiency in learning and the arts, and yet be affected by the most ridiculous superstitions. The Egyptians, as appears from hieroglyphics, paintings, and records of various kinds, were adepts at mechanical expedients, and possessed almost all the elegances of refined living which are now common in an improved form in Europe. In the construction of their pyramids and other large buildings, no degree of labour for any length of time seems to have intimidated them. The huge blocks of stone, sometimes weighing 1000 tons each, were dragged for hundreds of miles on sledges, and their transport, perhaps, did not occupy less time than a year; in one case which is known, 2000 men were employed three years in bringing a single stone from a quarry to the building in which it was to be placed. Usually, the sledges were drawn by men yoked in rows to separate ropes, all pulling at a ring fixed to the block. Where it was possible, the blocks were brought from the quarries on flat-bottomed boats on the Nile. But the transport of these large masses was much more easily accomplished than the placing of them in elevated situations in the buildings. They were raised by the power of levers and inclined planes of immense trouble and cost. One of the largest is the lintel over the doorway leading into the grand hall at Karnac; it measures 40 feet 10 inches long, and five feet square. It is understood that slaves or captives furnished a large share of the moving force in these undertakings; but besides these there was a variety of classes of workers, each carefully trained in the performance of his own particular duty; for instance, in dragging the blocks, there were employed slaves to pull, guards to watch, task-masters to regulate the operations, men with jars to throw water on the ground before the sledges, and, lastly, a person whose duty consisted in marking the time to the cadence of a song to ensure a simultaneous draught. This practice of shouting or singing to mark time during work, as still customary among sailors, is of extremely ancient date, being alluded to in the book of Jeremiah, xxv. 30:—"He shall give a shout as they that tread out the grapes."

The most extraordinary of the customs of this remarkable people was that of embalming their dead bodies with a view to perpetual preservation in the tomb. The business of embalming was very dignified, and was aided by a host of inferior functionaries who made and painted coffins and other articles which were required. The bodies of the poorer classes were merely dried with salt or natron, and wrapped up in coarse cloths, and deposited in the catacombs. The bodies of the rich and great underwent the most complicated operations, wrapped in bandages dipped in balsam, and laboriously adorned with all kinds of ornaments. Thus prepared, they were placed in highly-decorated cases or coffins, and then consigned to sarcophagi in the catacombs or pyramids. Bodies so preserved have been called mummies, from the Arabian word *mumia*, or the Coptic word *mum*, signifying bitumen or wax. The quantity of mummies carried off in modern times to England, France, and indeed every European country, has been very considerable. The collection of them, and other Egyptian antiquities, in the British Museum, is very extensive.

MEHEMET ALI.—MODERN EGYPT.

Mehemet or Mahomet Ali, the modern reformer and pasha of Egypt, was born at Cavallo, in Roumelia, a part of European Turkey. His parents, who were of an humble condition of life, had a family of sixteen children, of whom he was the youngest; and being a greater favourite than his brothers and sisters, he in early life came accustomed to indulgences, and to be impatient of the control of superiors. His youth, it has been related, was partly spent in the service of a tobacconist, but leaving this employment, which was unsuitable to his genius, he entered the Turkish army as a common soldier, at a time when troops were raising in his native district. This was the sphere of life in which he was calculated to shine. Distinguishing himself as a soldier by his bold and skilful conduct, he soon attracted the attention of beys, pashas, and the sultan himself; and having attained a prominent position in the bloody wars that distracted Egypt under the Mamelukes, he rose to be Pasha, or Viceroy of Egypt, one of the highest posts of honour in the whole Turkish empire. On getting the command of that province, he speedily showed that he was no ordinary man. He established a regularly paid, disciplined, and armed military force, on the European plan, instead of the irregular bands of men serving as soldiers in Egypt. The remnant of the Mamelukes, that remarkable body of men, which since the days of Saladin had practically governed Egypt by overawing the viceregal authority, he annihilated, and thus became the uncontrolled lord of the land of the Pharaohs, Ptolemies, Cæsars, and Caliphs. By the strictness of his government, he rendered Egypt as safe to travellers as any ordinary civilized country. Agriculture, commerce, manufactures, all engaged his attention; and though his reforms were accomplished with a despotic hand, perhaps with no small degree of cruelty, his conduct deserves our approbation. He may be crafty, cruel, and treacherous, still he has prodigiously advanced the cause of civilization and improvement in Egypt, and opened the way for further and more important reforms.

Mehemet Ali has a family of several sons, the eldest of whom, Ibrahim Pacha, acts as commander-in-chief of his troops, and is understood to be of a less sagacious mind than his father. It is incontestible that Mehemet Ali has done much to further the advancement of civilization in modern Egypt, but the whole of his efforts have at the same time tended to personal aggrandizement, and to the complete subjection of the people to his will. In order to maintain his authority, he raises troops from amongst the male population by the most tyrannical means; and so much is this forced military service detested, that great numbers of young men mutilate themselves, by destroying an eye, or cutting off one or more fingers, in order to escape the conscription. Having been lately driven from Syria, with a prospect of being permanently confined to Egypt, it is likely that the pasha will relax the excessive military burdens of the people. In the meanwhile, his lust of conquest has led to the exaction of taxes to a degree altogether unheard of in any country laying claim to civilization. "His revenue," says Mr. Lane,* "is generally said to amount to about £3,000,000 sterling. Nearly half arises from the direct taxes on land, and from indirect exactions from the fellaheen (fellahs or agriculturists), the remainder principally from the custom-taxes, the tax on palm-trees, a kind of income tax, and the sale of various productions of the land [no one being permitted to export corn or cotton but himself]; by which sale, the government, in most instances, obtains a profit of more than fifty per cent. The present pasha has increased his revenue to this amount by the most oppressive measures. He has dispossessed of their lands all the private proprietors throughout his dominions, allotting to each, as a partial compensation, a pension for life proportioned to the extent and quality of the land which belonged to him. The farmer has, therefore, nothing to leave to his children but his hut, and perhaps a few cattle and some small savings.

"The direct taxes on land are proportioned to the natural advantages of the soil. Their average amount

* Account of the Manners and Customs of the Modern Egyptians. 2 vols. 1836.

is about 8s. per feddan, which is nearly equal to an English acre. But the cultivator can never calculate exactly the full amount of what the government will require of him: he suffers from indirect exactions of quantities (differing in different years, but always levied per feddan) of butter, honey, wax, wool, baskets of palm-leaves, ropes of the fibres of the palm-tree, and other commodities; he is also obliged to pay the hire of the camels which convey his grain to the government shooneh (or granary), and to defray various other expenses. A portion of the produce of his land is taken by the government, and sometimes the whole produce, at a fixed and fair price, which, however, in many parts of Egypt, is retained to make up for the debts of the insolvent peasants. The fellah, to supply the bare necessaries of life, is often obliged to steal, and convey secretly to his hut, as much as he can of the produce of his land. He may either himself supply the seed for his land, or obtain it as a loan from the government; but in the latter case he seldom obtains a sufficient quantity; a considerable portion being generally stolen by the persons through whose hands it passes before he receives it. It would be scarcely possible for them to suffer more, and live. It may be hardly necessary, therefore, to add, that few of the fellahs engage with assiduity in the labours of agriculture, unless compelled to do so by their superiors. The pasha has not only taken possession of the lands of the private proprietors, but he has also thrown into his treasury a considerable proportion of the incomes of religious and charitable institutions, deeming their accumulated wealth superfluous. He first imposed a tax (of nearly half the amount of the regular land-tax) upon all land which had become a *wuckf* (or legacy unalienable by law) to any mosque, fountain, public school, &c.; and afterwards took absolute possession of such lands, granting certain annuities in lieu of them, for keeping in repair the respective buildings, and for the maintenance of those persons attached to them, as nazirs (or wardens), religious ministers, inferior servants, students, and other pensioners." Mr. Lane subsequently mentions, that sometimes the poverty of parents causes them to sell their children to any one who will purchase them, which presents a shocking idea of the degraded condition of the humble order of modern Egyptians.

In pursuing his schemes of improvement and family aggrandizement, Mehemet Ali acts as a despotic monopolist in all matters relating to both agriculture and commerce. He not only dictates what article of produce shall be cultivated, but the price at which it shall be sold. According to Dr. Bowring, it appears that in 1834, the country produced about 500,000 quarters of wheat, 450,000 quarters of dourah, 400,000 of beans, 280,000 of barley, and 80,000 of maize. Of wheat, however, the produce sometimes rises to 1,000,000 of quarters. Dourah or Indian millet (*sorghum vulgare*) is used for bread by the fellahs or labourers. It is the same plant which is raised in the West Indies for food to the negroes, under the name of Guinea corn. Its price is 30 or 40 per cent. below that of wheat. The helbeh is a coarser seed, sometimes mixed with it. The average price of wheat is from 20s. to 27s. per quarter at Cairo, but in years of scarcity it rises to 60s. Egypt is generally an exporting country, but in 1837 it was forced to draw supplies from abroad. The cultivation of cotton was introduced by the pasha very recently, and succeeds well, the exports of this article in 1834 having been 300,000 cwts.; but as the government is the exclusive purchaser, and only gives what price it pleases, the fellahs would not raise it unless compelled by the despotic mandates of the pasha. He has endeavoured to extend the cultivation of sugar, has introduced improved sugar-mills, and brought persons from the British colonies to distil rum. He has also invited Armenians from Smyrna and the East Indies to teach his people how to cultivate opium and indigo, and prepare them for the market. There are about two millions of date trees in Egypt, each of which yields by its fruit from 8s. to 16s. per annum. A few attempts have been made to introduce the vine. Onions are still produced and consumed in prodigious quantities, as in the days of Herodotus. The pasha has established model farms, with improved ploughs, &c., but even his despotism cannot induce the people to abandon their ancient rude processes and implements.

The pasha is a great manufacturer. He has built large mills, and procured skilled workmen at a great expense from France, Italy, Germany, Belgium, and Britain, to conduct them. He has manufactories of cotton yarn and cotton cloth, woollens, carpets, ironware, muskets, cannon, bayonets, gunpowder, &c. All these establishments are believed to be attended with loss to his highness, and in some cases the loss is heavy. His spinning-mills for cotton are the most extensive of his manufactories. There are twenty-two of these, which, according to Dr. Bowring, produce about 210,000 rottoli of yarn monthly, of various qualities, from coarse to "very fine." The Cairo rottoli is, we believe, just equal to the British pound, while the Alexandrian rather exceeds two pounds. The former, we suppose, is the weight alluded to in this instance; but as the cost of this yarn to the pasha is said to be only L.5270, we suspect there is some mistake in the statement. The men are paid fixed wages, generally about twopence per day, and they are punished with the lash for bad work or misconduct. The pasha has three manufactories of arms, which turn out 1600 muskets and bayonets per month. The largest one is managed by an Englishman, who has five other Englishmen and a number of Arabs under him.

All travellers represent Mehemet Ali as a person of plain and affable manners in private life, and fond of his family. Dr. Bowring speaks of him as follows:—"Mehemet Ali was forty-six years old before he had learned either to read or to write. This he told me himself. I have heard that he was taught by his favourite wife. But he is fond of reading now; and one day, when I entered his divan unannounced, I found him quite alone, with his spectacles on, reading a Turkish volume, which he was much enjoying, while a considerable pile of books were by his side. 'It is a pleasant relief,' he said, 'from public business; I was reading some amusing Turkish stories' (probably the Arabian Nights); 'and now let us talk—what have you to tell me?' There is a great deal of sagacity in Mehemet Ali's conversation, particularly when he knows or discovers, as he usually does, the sort of information which his visitor is most able to give. He discourses with engineers about mechanical improvements—with military men on the art of war—with sea-officers on ship-building and naval manœuvres—with travellers on the countries they have visited—with politicians on public affairs. He very willingly talks of foreign countries, and princes and statesmen, and is in the habit of mingling in the conversation all sorts of anecdotes about himself, and the events connected with his history. His phrases are often poetical, and, like most Orientals, he frequently introduces proverbs and imagery. I heard him once say, speaking of the agriculture of Egypt, 'When I came to this country, I only scratched it with a pin; I have now succeeded in cultivating it with a hoe; but soon I will have a plough passing over the whole land.'

"Mehemet Ali's great pride is Ibrahim Pacha; a victorious leader is always an object of admiration among Mussulmans, and Ibrahim Pacha's career has been one of brilliant military success. His father is fond of talking of his first-born son and intended successor. 'I did not know him,' he said; 'I had not an unbounded confidence in him for many, many years; no, not till his beard was almost as long as my own, and even changing its colour,' said the pasha to me; but now I can thoroughly

trust him.' On the part of Ibrahim Pacha there is always the utmost deference to Mehemet Ali's will. 'I have been very happy in my children,' Mehemet Ali said to me one day; 'there is not one of them who does not treat me with the utmost deference and respect.'"

Notwithstanding the improvements in education carried into effect by Mehemet Ali, the more opulent classes in modern Egypt are exceedingly ignorant. We learn from Mr. Lane that "many of the tradesmen of Cairo can neither read nor write, or can only read, and are obliged to have recourse to a friend to write their accounts, letters, &c.; but those persons generally cast accounts and make intricate calculations, mentally, with surprising rapidity and correctness." General learning is confined within very narrow limits. Very few persons "study medicine, chemistry, mathematics, or astronomy. The Egyptian medical and surgical practitioners are mostly barbers, miserably ignorant of the sciences which they profess, and unskilful in their practice, partly in consequence of their being prohibited by their religion from availing themselves of the advantage of dissecting human bodies. But a number of young men, natives of Egypt, are now receiving European instruction in medicine, anatomy, surgery, and other sciences, for the service of the government. Many of the Egyptians, in illness, neglect medical aid, placing their whole reliance on Providence or charms. Alchemy is more studied in this country than pure chemistry; and astrology more than astronomy. To say that the earth revolves round the sun, they consider absolute heresy. Of geography, the Egyptians in general, and, with very few exceptions, the best instructed among them, have scarcely any knowledge; having no good maps, they are almost wholly ignorant of the relative situations of the several great countries of Europe. Some few of the learned venture to assert that the earth is a globe, but they are opposed by a great majority of the Oolama. The common opinion of all classes of Moslems is, that the earth is an almost plane expanse, surrounded by the ocean, which, they say, is encompassed by a chain of mountains called *Ckaf*." Such being the condition of general knowledge among the modern Egyptians, it does not surprise us to learn that they labour under the most ridiculous superstitions, and believe in the powers of magic. Mr. Lane represents the people, among whom he lived for some time, as of an overreaching and deceitful disposition; but accounts for these and other vices by the manner in which they are ground under a rapacious and tyrannical system of government. By a singular contradiction of character, "they are generally honest in the payment of debts. Their prophet asserted, that even martyrdom would not atone for a debt undischarged. Few of them ever accept interest for a loan of money, as it is strictly forbidden by their law."

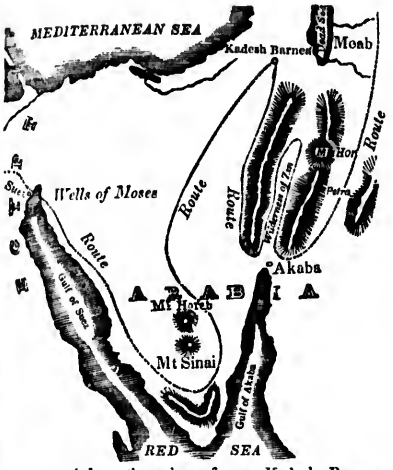
Oppressed as modern Egypt is, it is gratifying to reflect that it is improving in various respects in its condition. The pasha has introduced a number of intelligent Europeans into his military and civil services. Printing is now executed at Boulac, near Cairo, the press having there produced more than a hundred different books in the Arabic language, for the use of the military, naval, and civil servants of the government. A newspaper and an annual almanac are also regularly printed at Boulac. A considerable export and import trade is now carried on, the raw produce of the country being exchanged for the manufactured woollen, cotton, silk, and other goods of Europe. The cause of national regeneration is further advanced by the regular arrival of steam-vessels at Alexandria from Malta, bringing hosts of European travellers and persons who design reaching India by a journey from Cairo to Suez, and thence by steamboats down the Red Sea to Bombay.

Treasury of Pharaoh, Petra.

THE Jews are the most ancient race of mankind of whom we possess any regular or authentic history, or whose existence as a distinct people can be clearly traced from the primeval ages till the present day. According to the accounts given of them in Scripture, and in their history by Josephus, they were descended from Abraham, the tenth in descent from Noah, through his second son Shem. According to Josephus, Abraham, who was born in the 292d year (according to other authorities, in the 352d year) after the Deluge, "left the land of Chaldea when he was seventy-five years old, and at the command of God went into Canaan, and therein he dwelt himself, and left it to his posterity. He was a person of great sagacity, both for understanding of all things and persuading his hearers, and not mistaken in his opinions; for which reason he began to have higher notions of virtue than others had, and he determined to renew and to change the opinion all men happened then to have concerning God; for he was the first that ventured to publish this notion, that there was but ONE God, the Creator of the universe; and that as to other goda, if they contributed any thing to the happiness of men, that each of them afforded it only according to his appointment, and not by their own power. For which doctrines, when the Chaldeans and other people of Mesopotamia raised a tumult against him, he thought fit to leave that country, and at the command of God he came and lived in the land of Canaan. And when he was there settled, he built an altar, and performed a sacrifice to God." Abraham spent the chief part of the remainder of his life in Canaan; and dying at the age of one hundred and seventy-five years, was buried in the tomb of his wife Sarah, in Hebron. At his death, he left one legitimate son, Isaac, who had two sons, Esau and Jacob.

After the death of Isaac, his sons divided their inheritance, and Esau departing from Hebron, "left it to his brother, and dwelt in Seir, and ruled over Idumea." Jacob remained for a number of years in Canaan, surrounded by a family of twelve sons, one of whom, Joseph, as related in Scripture, became the cause of the removal of his father and brethren, and all belonging to them, into Egypt. The Hebrew emigrants were seventy in number, and formed at the first a respectable colony among the Egyptians. Jacob died after having been seventeen years in Egypt, and his body was carried by Joseph to Hebron, and buried in the sepulchre of his father and grandfather. Joseph also died in Egypt at the age of a hundred and ten, and at length his brethren died likewise. Each of the twelve sons of Jacob became the progenitor of a family or tribe, and the twelve tribes, personified by the term ISRAEL, continued to reside in Egypt, where they increased both in number and in wealth. Their rapid increase and prosperity soon excited the jealousy of the masters of the country; and from being in high favour, the different tribes gradually fell under the lash of power, and came to be treated as public slaves. The Egyptian rulers enjoined them to cut canals in connection with the Nile, to build walls and ramparts for cities, to make bricks, and to perform other laborious offices. "And four hundred years did they spend under these afflictions; for they strove one against the other which should get the mastery, the Egyptians desiring to destroy the Israelites by these labours, and the Israelites desiring to hold out to the end under them." From the description of their situation which is given in Genesis, and the affecting allusions to it afterwards in different passages of the Psalms, it appears that their tyrannical masters viewed them with the most unjustifiable hatred, contempt, and fear. Their sufferings were at last avenged by a direct interposition of Providence, which visited their oppressors with successive plagues, storm, vermin, and pestilence, till every living and growing thing in the land of Egypt was threatened with destruction, and the selfish rulers of the country were at last constrained by terror to release their injured bondamen.

The entire body of Israelites, guided by Moses, fled from Egypt in the year 1490 before Christ, at a time when Thebes, Memphis, and the other magnificent cities of that country, were in all their glory. Proceeding in a north-easterly direction from Rameses (near the site of modern Cairo), they went through the flat region of the land of Goshen (now a barren sandy plain) to the head of the Gulf of Suez, the western branch of the Red Sea. Here they crossed in a miraculous manner to the opposite shore, to a spot now called the Wells of Moses, where, according to the Scripture narrative, they sang their song of thanksgiving for their deliverance. The country in which they had now arrived was a portion of Arabia Petræa, consisting of a dismal barren wilderness, now called the desert of Sinai, from the principal mountain which rises within it. From the point at which the Israelites had crossed the Red Sea from Egypt, they were conducted by a most circuitous and tedious route towards the Promised Land of Canaan, once the residence of their fathers. Their route (see following map) lay along the eastern border of the Gulf of Suez to a point beyond Mount Sinai; then, turning



they proceeded northward as far as Kadesh Barnea; from that they turned again southward to near the head of the Gulf of Akaba; again, they bent their way northward through the wilderness of Zin to Mount Hor, where Aaron was buried. Being at this point refused a passage through the country of the Idumeans or Edomites, they retreated along the path by which they had entered the desert vale; and lastly issued upon the plains near the Gulf of Akaba, and compassing on the south the land of Moab, arrived at Gilgal in the Promised Land.* This painful and tiresome journey extended over a period of forty years, and was not completed till all the Hebrews who were above twenty years of age when they left the land of Egypt (excepting Caleb and Joshua) had died, and a new generation possessing greater courage and confidence in the Almighty had succeeded them. In the trackless wilderness through which they were led, their multitudes, as we learn from Scripture, could neither have traced their way nor procured subsistence, without a continued miracle. The hand of God brought for them streams of water out of the flinty rock; rained manna or bread from heaven; and gave a pillar of cloud to direct their journeys through the day, and a pillar of fire by night. He delivered the tables of a moral law, comprehending the ten commandments, to Moses their leader; and gave out a set of regulations for the ceremonies of worship, the establishment of a separate order devoted to religion and learning, and for the civil government of the nation. They had thus a regular polity and written laws, when most other nations knew only the law of the sword, or of savage animal superiority.

The country on the shore of the Mediterranean which was allotted as a settlement to this people, was at that time occupied by many warlike tribes, who had grown strong in its fertile plains and valleys; and the generation of the Hebrews who were conducted into it were compelled to fight for its possession. The struggle was not of long continuance. The armies of the Ammonites and Canaanites were defeated one after another in rapid succession; and the alarm which had deterred their fathers from making the attack, was now transferred to their enemies, who feared it. The old Israelites had said in the desert, "We are in our own sight as grasshoppers before these sons of Anak; hath the Lord brought us out of the land of Egypt to fall by the sword of this people?" But the new generation had a firmer confidence in the help which was promised them; and it was now the turn of their foes to shrink, "insomuch that their hearts melted, neither was their spirit in them any more, because of the children of Israel." The land was conquered in the year 1450 before Christ.

According to the account given in the 26th chapter of the book of Numbers, the Hebrew nation thus brought out of the land of Egypt and settled in Canaan, amounted to 601,730 souls, unto whom the land was divided for an inheritance, according to the number of individuals in the respective tribes. The tribes, and their fighting men above twenty years of age, were reckoned as follow:—Tribe of Reuben (the eldest son of Jacob) 43,730; Simeon 22,200; Gad 40,500; Judah 76,500, Issachar 64,300; Zebulun 60,500; Manasseh 52,700, Ephraim 32,500 (the tribes of Manasseh and Ephraim were both from Joseph); Benjamin 45,600; Dan 64,400, Asher 53,400; and Naphthali 45,400. Among these twelve tribes the land was divided. The tribe of Levi (to which belonged Moses, Aaron, and Eleazer the high priest), amounting to 23,000 males from a month old and upwards, received no share of the land; being set apart for the priesthood, the tenth or tithe of the general produce was assigned them as their perpetual inheritance. By making a special agreement with the other tribes that they should assist them against the common enemy, the two tribes of Gad and Reuben, and the half tribe of Manasseh, were permitted to appropriate land for their inheritance in Gilead and Bashan, on the Arabian side of the Jordan.

Previous to the settlement of the tribes in Canaan, they were called together by Moses to receive his parting address, for it was ordained that he should not enter the land along with them. The account of this memorable assemblage is given in the first chapter of Deuteronomy. Having first narrated the history of their tedious journey in the wilderness, and its objects, Moses proceeded to promulgate and explain to them, as their lawgiver, the statutes and commandments for their obedience, and the form of government, secular and spiritual, which they should adopt. Among other things, he recommended the erection of a capital city, where the great temple should be, and to which the whole people should repair three times a year, for the purpose of offering thanks to God for his former benefits, and entreating him for those they should require hereafter; also with the view of maintaining a friendly correspondance among the various tribes and orders of people. In obedience to this and subsequent injunctions, the Israelites built Jerusalem, and established the temple on Mount Zion within its walls. Moses, in concluding his lengthened address to the people of Israel, sang a song of praise to God, breathing a spirit of the most exalted piety (Deut. xxxii.), and bidding the sorrowing multitude adieu, proceeded alone to the top of Mount Pisgah, in the land of Moab, where he died. The place of his interment was concealed.

Moses was succeeded by Joshua as a leader, and by him the Israelites were conducted across the Jordan. The political government of the various tribes, after their conquest and settlement of Canaan, appears to have been republican, with military leaders called judges; but these acted by the direction of the priesthood, who were immediately counselled by the Deity within the sanctuary, the government of the Jews has thus been called a *theocracy*, or government by God. Their position, in the midst of hostile nations, required constant vigilance. In the book of Judges, we find them under the command of Gideon and other leaders. The instances of generous patriotism, of bravery, and of devout confidence in the God of their fathers, which are shown in the acts of several of the judges, render the record of their history one of the most interesting and romantic in the earth. Yet they were often reduced to the greatest distress.

* An account of Arabia Petræa, through which the Israelites travelled, is given in the latter part of the present sheet.

"Because of the Midianites," it is said, "the children of Israel made them dens in the mountains, caves, and strongholds; and when Israel had sown, the people of the east came up against them, and destroyed the increase of the earth, till they left no sustenance for Israel, neither sheep, nor ox, nor ass—for they came up as the grasshoppers for multitude; and the children of Israel cried to the Lord." From these calamities they were at times delivered by the devotion of some pastoral soldier among their tribes. Their songs of rejoicing on such occasions still more pathetically tell the disturbed state of the country, and present the troubles of its inhabitants for three hundred years (before Christ 1427 to 1112), while they formed a republic under their judges. It says much for this people, that in the midst of such a scene of unrest, they continued still to cultivate letters. The beautiful simplicity of the narratives given concerning the heroes of their country, is not to be equalled in any other remains of antiquity.

The epoch of kings succeeded that of judges. The reign of Saul, their first monarch, though the people were stronger by being united, was gloomy and troubled. David, who succeeded, was a soldier and a conqueror. He rendered the Hebrews formidable to the whole of their enemies, and gave them a regular and defensible position, expelling their old antagonists from every part of the country. He left an empire peaceful, respected, and strong; and, what was of as much importance, he selected from among his sons a successor who was able to improve all these advantages, and to add to the progress which his countrymen had already made in prosperity. Under Solomon, the name of the Hebrew government being able to protect its subjects in other countries, the people and their king began to employ themselves in commerce. Their trade was at first engrafted on that of Tyre, a people speaking a similar language with themselves, and like them, too (though certainly in a smaller degree), acquainted with the art of writing. We only find in Scripture an account of the state of commerce in Solomon's time; but there is no reason to suppose that after his day it was discontinued. It was, perhaps, no longer a matter of state; but the wealth of the country, which exposed it to continued pillage, and the number of prosperous Hebrews who were found in all parts of the earth (it would be idle to say that these were all brought away as captives), render it probable that, from the splendid reign of this monarch, they always continued to be addicted to commerce. It is indeed likely that they had been so before his reign, and that Solomon merely took commerce under the protection of the state; for there is no instance on record of any monarch all at once, and successfully, creating a national trade. However this may be, a greater contrast cannot be imagined than between the troubles of the time of the judges (only one hundred years before), and the peace, security, and enjoyment of this reign. "And the king made silver to be in Jerusalem as stones; and cedars made he to be as sycamore trees that are in the vale for abundance; and Judah and Israel were many; as the sand which is by the sea-shore for multitude, eating, and drinking, and making merry." The riches lavished upon the temple, which was erected in his time, are still the wonder of the east and west; and though the building itself may now be rivalled in extent by many of our parish churches, yet the gold, ivory, and other precious materials employed in its decoration, indicate a wealth which must, at that time, have been without a parallel. Both Solomon, and David his father, were men accomplished in learning, as well as in the arts of government; and the writings which they have left, if they show their own abilities, indicate not less a great attention to the cultivation of knowledge among the rest of the Hebrews.

After the death of Solomon, the country fell into the same divisions which had weakened it in the time of the judges. Each of the districts of North and South Israel was under a separate king, and the people were exposed both to the attacks of their enemies and to quarrels with each other. Their history is a succession of agitating conflicts for independence, and of unexpected and remarkable deliverances, of a similar nature to those of the earlier period, and they continued for about the same length of time (380 years); but they are marked by fewer of those traits of heroic devotion which distinguished the epoch of the judges. The backslidings, errors, and misgovernment of their kings, is the chief and painful subject which is presented to us; and though these are relieved at times by the appearance of such monarchs as Josiah, Jehoshaphat, and Hezekiah, yet the whole history of this period is overcast with the gloominess of progressive decline. By far the most delightful parts of it are those which relate to the lives of the prophets, who were raised up at intervals to warn the nation and its rulers of the fate which they incurred by forsaking the religion of their fathers. These inspired men sometimes sprang up from among the humblest classes of the community; one from "the herdsmen of Tekoa," another from "ploughing with twelve yoke of oxen;" several were of the priestly order, and one (Isaiah) is said to have been of royal lineage; but the works of all are marked with the same sacredness, force, and authority. They reprehend their countrymen, in the most eloquent strains, at one time for their idolatry, and at another for their hypocrisy; and their indignation is expressed with the same freedom and dignity against the vices of the highest and the lowest. It has become fashionable to trace the free spirit of our national tone of thinking to the historians and orators of Greece and Rome, which are taught in our schools; but any one who looks into the writings of the Hebrew prophets, and sees the boldness and energy with which the humblest of them threatens the nobles and princes of his country, or chastises the vices of the nation around him, will remark the pedantry of seeking, in volumes known only to the learned, for an effect which may be traced to books whose strong and pathetic eloquence has long swayed the affections of every peasant of the country. There is no subtlety of reasoning, no sporting with ambiguities in these writings; every thing is bold, decided, and powerful, appealing to great principles, and marked with high and energetic feelings. What a film of fancy-work are the metaphysical ingenuities of Plato, compared with the firm, broad, and uncompromising morality, the mild domestic charities, taught in the books of Psalms and Proverbs, or the pathetic and indignant remonstrances of the prophets against the backslidings of the "daughter of their people!"

At the end of the epoch of the kings (about 600 years before Christ), the land of Israel was swept by several powerful invaders, who carried off many thousands of the people into captivity. Little is known of the fate of those of the northern district, who are by some supposed to have been carried to India, by others to Tartary; but there are many interesting notices of the captives of Judah. These were carried to Babylon, a flat country intersected by rivers, to the eastward of their own. Here they seem to have been treated with kindness, and many of them even arrived at wealth and distinction. Nothing, however, could overcome their regret at being torn from the country of their ancestors—a feeling which is expressed with unrivalled beauty in the 137th Psalm, where the Hebrew captive looks back mournfully to the mountains and brooks of Judah, as he hangs his harp on the willows by the sluggish Euphrates, and refuses, with sorrow and scorn, to gratify his conquerors by singing the celebrated songs of his country in a strange land. It is a further proof of what we have said of the general intelligence and education of the Jews, that all the cou

querors who carried them off granted them high privileges in their new countries. Alexander, it is said, made them equal with his own Macedonians in the city which he founded; Ptolemy conferred on them similar privileges. We find the celebrated man of their nation (Daniel) chief minister of two successive monarchies.

After seventy years (during which there is little recorded of the people who were left in the country), permission was given to some of the chief Hebrews of the captivity to return with their people to Judea, and to establish there a government, conducted by their own countrymen, under the protection of the Persians. They were also allowed to rebuild the temple. Many families returned accordingly; and the Hebrews from this period enjoyed, as tributaries of this powerful monarchy, a peace of about 220 years, during which their country seems to have been quiet and prosperous. About 187 years before Christ, in consequence of their becoming involved in the quarrels of neighbouring powers, they were obliged to maintain a series of struggles in behalf both of their religious and national independence, more fierce and prolonged than we read of in almost any other nation. We are accustomed to admire the gallantry and perseverance of Wallace and of William Tell in behalf of their country; but Judas Maccabeus surpassed both, and with more brilliant success. The actions of one family of Jewish priests, belonging to a town (Modin) the site of which is afterwards noticed, might dignify the escutcheons of a whole aristocracy. Under them the Hebrews were again, for three reigns, an independent and even a powerful people.

The empire of the Romans was now extending itself to the east; and that power, being called in to aid the Hebrews on one occasion (about seventy years before Christ), seized the opportunity to establish its influence among them permanently. Their kings, the three Herods, and their other rulers, were now dependants of the emperor, and their country the tributary of Rome. On obtaining full possession of the country, the Romans divided Palestine (the region between the Mediterranean and the Jordan) into three tetrarchies or provinces—Judea, Samaria, and Galilee. It is creditable to the Romans, however, that while thus taking complete political possession of the ancient land of Israel, they in no respect interfered with the religion or other usages of the people, which they left under the direction of the sanhedrim and elders as of old. But notwithstanding this favourable arrangement, the Jewish nation was restless and unhappy; it was broken up into parties and sects, and some of these continually plotted schemes for a restoration of independence. The country was in this humbled and distracted condition when "Jesus was born in Bethlehem of Judea, in the days of Herod, the king." This most important of all events, which occurred in the reign of the Emperor Augustus, and marks the commencement of our era, made no difference politically in the condition of the Jewish people. During the continuance of Christ on earth, we do not read of any civil war in Palestine; but between thirty and forty years afterwards, serious insurrections broke out against the Roman authority, and the country was exposed to the greatest sufferings. In the year 70, Titus took Jerusalem by assault, burned the temple, and sold into slavery, or drove into exile, all the inhabitants who escaped death. About 110,000 Jews perished during the siege and at the destruction of Jerusalem.

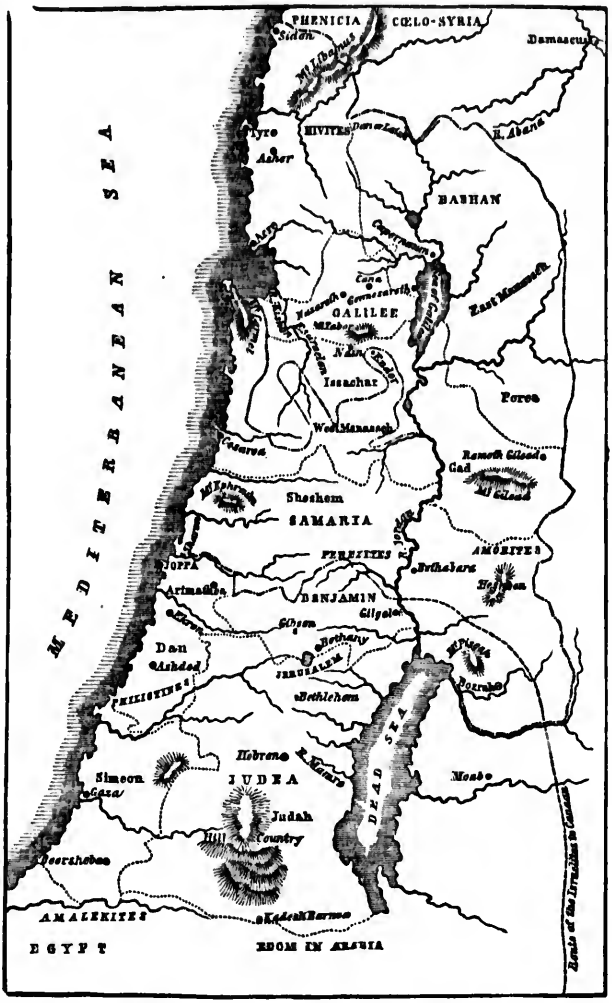
Reckoning from the settlement of Canaan by the Israelites till this last dire calamity, the Jewish nation existed in a regular form, though under various modifications, for 1560 years. Since they were first scattered over the face of the earth, in which condition they still exist, 1770 years have elapsed (reckoning till 1840), so that they have already been longer a scattered than they were a united people. By a late calculation, it is ascertained that the Jews now existing in different parts of Europe amount to 1,918,053; in Asia 738,000; in Africa 504,000; in America 5700; and in New Holland 50—grand total 3,218,000. Other estimates carry the number to 5,000,000 or even 6,000,000. In most countries they are still treated as strangers, and denied the rights of citizenship, though in manners, language, and general conduct, they do not differ from the common inhabitants. The government of the United States of North America was the first which placed them on the same political level with other citizens. More recently, the laws excluding them from civil privileges have been one after another abolished in the kingdom of the Netherlands, until they are now in all respects on an equality with the other people of that country. There is, we believe, evidence of the most incontrovertible nature, namely, statistical evidence, to show that crime has diminished among the Hebrews, as invidious distinctions have been thus done away with.

For a period of upwards of 200 years after the final dispersion of the nation, Palestine continued in a miserable condition. On the conversion of the Romans to Christianity, it became an object of religious veneration, as the scene of the ministrations of Christ and his apostles. The Empress Helena repaired in pilgrimage to the "Holy Land," viewed all the spots rendered remarkable by events in the gospel history, and built splendid temples, or other religious structures, on their sites. The Holy Land was now enriched by the crowd of pilgrims who came from all parts of the Christian world. The destinies of Judea, however, were changed by the invasion of the fanatical followers of Mohammed, in the sixth century, and soon fell under their sway. The caliphs, or Arabian monarchs, indeed, still viewed her holy places with reverence, and were induced to encourage pilgrimage, from the gain which it afforded. But when the Turks, an ignorant and barbarous race, poured in from the north, the same courtesy was no longer observed. They profaned the holy places, and committed outrages of every kind upon the visitants to the Holy Land. The pilgrims on their return related the dangers they had encountered. These representations kindled the religious zeal of the Christians in Europe into a flame, and a general ardour was awakened to "free the holy sepulchre from thrall." Now ensued a series of warlike expeditions, termed crusades, for the recovery of Palestine from the Mohammedans. After various successes and disasters, the crusades terminated in the middle of the thirteenth century, leaving the Holy Land still in the possession of a barbarous Mohammedan people. (See article HISTORY OF THE MIDDLE AGES.) In the year 1517, Palestine was annexed to the Turkish empire, and still remains a portion of Turkey in Asia. As such, it belongs to the pashalik of Damascus, and is (or was lately) under the jurisdiction of Mehemet Ali, the pasha of Egypt, by whose firm though precarious government it has been rendered much more safe to the visits of travellers than it was in past times. Its population now consists of a mixture of Turks and Arabs, chiefly the latter, with a small number of Jews and Christians.

PALESTINE.

Palestine, or the Land of Canaan, in which the Israelites settled after their protracted wanderings in the deserts, is a small country, forming part of Syria (which is a modern name for an indistinct portion of north Arabia), and lies on the shore of the Mediterranean Sea, between the 31st and 34th degrees of north latitude. With the whole of Arabia behind it, it may be described as a frontier border to that extensive pastoral region. Lying with the Mediterranean (anciently the Great) Sea on the west, it has Phœnicia on the north, Arabia on the east and south-east, and Idumea or Arabia Petræa on the south. The country has been called Palestine, as is supposed, from the Philistines, who were once its possessors,

let in the Scriptures, from various circumstances, it has received the appellations of "the Promised Land," "the Land of Canaan," and "the Land of Judea." In modern times, from its connection with the events which occurred within it upon the promulgation of Christianity, it is more generally called "the Holy Land."



Palestine extends from north to south a length of about two hundred miles, and fifty in breadth, and is, therefore, in point of size, of nearly the same extent as Scotland. The general character of the country is that of a hilly region, interspersed with moderately fertile vales; and being thus irregular in surface, it possesses a number of brooks or streams, which, for the most part, are swollen considerably after rains, but are almost dry in the hot seasons of the year. The longest and principal valley is in the centre, in a direction from north to south, and in this flows the river Jordan, which is the chief of the Judean streams. It arises from the outskirts of the mountains of Lebanon or Libanus on the north, flows into the lake of Tiberias, or sea of Galilee, and thence continues its course to the Dead Sea, from which there is no perceptible outlet, the water probably waning by means of evaporation. The present condition of Palestine scarcely corresponds with its ancient fertility. This is chiefly attributable to the devastating effects of perpetual wars, and some physical changes have also contributed to the destruction of agricultural industry. Yet, after all, so excellent would the soil appear to be, and so ample its natural resources, that Canaan may still be characterized as a land flowing with milk and honey. Its pastures are extensive, and of the richest quality; and the rocky country is covered with aromatic plants, yielding to the wild bees which hive in the hollows of the rocks such an abundance of honey, that the poor classes use it as a common article of food. Dates which are found springing up in the midst of the most arid districts, are also another important article of

consumption. If to these we add olive oil, an article so essential to an oriental, the ancient fertility of even the most barren part of Judea becomes easily accounted for. Delicious wine is still produced in some districts, and the valleys bear plentiful crops of tobacco, wheat, barley, and millet. Among other indigenous productions may be enumerated the cedar and other varieties of the pine, the cypress, the oak, sycamore, mulberry-tree, fig-tree, the willow, acacia, aspen, arbutus, myrtle, tamarisk, oleander, oshar, doom, the turpentine, almond, peach, chaste and locust trees; the mustard plant, aloe, citron, apple, pomegranate, and many flowering shrubs. Other indigenous productions have either disappeared, or are confined to circumscribed districts. Iron is found in the mountain range of Libanus, and silk is produced in abundance in the plains of Samaria.

Generally speaking, the climate is mild and salubrious. From May to August the sky is clear and cloudless, but during the night there falls a copious dew, which moistens the soil. Intensely cold nights, however, frequently succeed to very sultry days—a vicissitude more than once referred to in Scripture. Rain falls in sufficiency during the rest of the year, to which, in the absence of springs, the fertility of Palestine is mainly attributable. As the streams pour in impetuous torrents through the vales after heavy rains, it is unsafe to erect habitations on the plains, and such most probably is the reason why the towns and villages of Palestine are almost uniformly built upon elevated grounds.

Of the animals which prevail, or formerly prevailed, in Palestine, it is unnecessary to say much. The wild animals referred to in Scripture, such as the lion, wolf, leopard, &c., have almost totally disappeared. The fox is still common. Anciently the horse and ass were here celebrated for their beauty. The breeds of cattle reared in Bashan and Gilead were remarkable for their size, strength, and fatness; but this is far from being the case now. The vulture, falcon, jackdaw, nightingale, fieldlark, goldfinch, partridge, quail, and the quail of the Israelites, the turtle and ringdove, are found, and various kinds of land and water game are abundant. The Holy Land is infested with a frightful number of lizards, different kinds of serpents, vipers, scorpions, and various insects. Flies of every species are also extremely annoying. Ants are very numerous in some parts; one traveller describes the road from El Arisch to Jaffa, as, for three days' journey, one continued ant-hill. But these creatures, numerous as they are, are harmless in comparison to the locusts which overspread the country. These insects sometimes came in flights, which, on alighting, cover the land, and destroy every blade of herbage in their way. To oppose their destructive ravages, the inhabitants attack them with fire and branches of trees, and endeavour, by every other means, either to kill them in masses or to cause them to take to flight. It is not uncommon for an army of soldiers to be sent out to assist in slaughtering or expelling them from the land.

Travellers usually reach Palestine from Europe by sea, few daring to encounter the danger of the route from Egypt, through the land of Edom. Vessels from Malta or Alexandria regularly proceed to Acre, and from that port the traveller journeys to Jerusalem and other parts of the country. The most interesting route seems to be, in the first place, southwards, along the coast of Jaffa, Ashdod, Askalon, Gaza, &c., and then striking inland to Jerusalem, Bethlehem, and the Dead Sea; and proceeding afterwards, in a northerly direction, to Tiberias, Nazareth, and Lebanon; lastly, before leaving Syria, making a journey to the ruined city of Baalbec, and to Damascus. In visiting these and other places mentioned in Scripture, the traveller is scarcely so much shocked with the changes produced on scenery and localities, by the hand of warlike invaders, as by that of over-pious Christians. By the Empress Helena, and other individuals, convents, chapels, and churches, have been erected over almost every spot rendered sacred by the ministrations of our Lord, so that the original character of the principal places mentioned in the New Testament is altogether destroyed.

ACRE—MOUNT CARMEL.

Acre stands close to the sea, at the end of a bay, extending in the form of a bow, at the distance of twelve miles to the north of Mount Carmel, which is also on the sea-shore. It was originally called Accha, and is alluded to in sacred writ: of this name Acre is evidently a corruption. Its name is usually preceded by the words "St. Jean," in consequence of the place having been given by Richard of England to the Knights of St. John of Jerusalem: at one time it received the name of Ptolemais. The place was visited by the apostles, and particularly by St. Paul. It has been the scene of a variety of bloody contests, especially during the period of the Crusades, and was the last place from which the Christians were driven. The Turks ultimately laid hold of it with a numerous army, after a furious siege, when terrible outrages were committed. They were in possession of it from 1291, till compelled to surrender it to Mehemet Ali, who in his turn has been obliged to give it up to the Turks, by the warlike operations of the European powers in 1840. As Acre is reckoned the key of Syria, and has the best port, the French under Bonaparte made violent efforts to grasp it; they were, however, as is well known, successfully repelled. Acre is very strongly fortified, being newly enclosed with high walls, and is considered the strongest place in Syria. The houses are of stone, with roofs like terraces, the entrances to which are narrow, and many appear to communicate with each other. The streets are dirty, and so contracted that there is no more than room for a loaded camel to pass along; hence the air is very impure. The bazaars are mean, and the inhabitants miserable. The population is reckoned to be about 10,000

Mount Carmel forms a promontory, or majestic head land, on the Mediterranean. It runs from east to west, and rises about two thousand feet above the level of the sea, by which its base is washed. Near it runs Kishon, one of the rivers which are particularly alluded to in the sacred writings. Carmel is the most beautiful mountain in Palestine; is of great length, and in many parts covered with trees; and a part of its summit is pointed out as the place where Elijah prayed for rain, and saw the humid cloud rise out of the sea. On the 20th of July, the Christians proceed to perform acts of devotion in memory of the prophet. There was formerly a monastery here, but it is now abandoned.

Between this point and Jaffa we meet with the ruins of several ancient villages and towns, amongst which are those of Cesarea. "Perhaps there has not been," says Dr. Clarke, "in the history of the world, an example of any city that in so short a space of time rose to such an extraordinary height of splendour as did this of Cesarea, or that exhibits a more awful contrast to its former magnificence, by the present desolate appearance of its ruins." In fact, not a solitary inhabitant remains where once stood the proud city of Herod. Its theatre, its palaces, and temples, form a marble desert.

A large part of this now desolate territory—that is from Carmel to Jaffa, an interval of about sixty miles—is the plain of Sharon, celebrated in Scripture for its beautiful flowers and fertility, particularly its "rose," of which distinct mention is made. In the present day, though in a wild condition, it still yields pomegranates, oranges, figs, and other eastern fruits.

Jaffa, which is near the southern extremity of the plain of Sharon, and is the Joppa of Scripture, is situated on a conical mount overhanging the Mediterranean. Jaffa is one of the most ancient sea-ports in the world, but for all purposes of maritime traffic it is now nearly unfitted from the badness of its harbour. It was to this place that

Solomon ordered the materials of his temple to be brought by sea from Lebanon; here the prophet Jonah embarked for Tarshish; and here, in apostolic times, St. Peter restored Tabitha to life. The town is at present fortified, and the inhabitants amount to between four and five thousand, who are mostly Turks and Arabs. Latterly it has been greatly injured by an earthquake. Between Jaffa and El Arisch, the extreme point of the Holy Land in this direction, lie various places celebrated in the scriptural record. These are

ASHDOD, EKRON, GATH, ASKELON, AND GAZA.

At about an hour's journey south from Jaffa is Edzoud, the ancient Ashdod, standing on the summit of a grassy hill, but now in a decayed condition. The ruined village of Tookrair, situated also on the top of a hill, occupies the site of Ekron, which does not possess the smallest vestige of its former grandeur. Gath, a place of strength in the time of the prophets Amos and Micah, is now also either entirely gone or degenerated to a few ruins and a hamlet. Askelon, farther on to the south, and likewise situated on the summit of a hill at the distance of three miles from the sea, still, to external appearance, maintains something of its ancient character. Its position is strong, and its walls, which are of great thickness, and considerable height, are built on the top of a ridge of rock, winding round the town in a semicircular direction, and terminating at each end in the sea. But, alas! they enclose not a living being. How truly has been fulfilled the prophecy of Zachariah, "The king shall perish from Gaza, and Askelon shall not be inhabited." Gaza is truly without a king. It is now only a large village, situated a few miles south from Askelon, with a number of poor narrow streets. There is some trade, however, carried on in Gaza, particularly in cotton, and the inhabitants exceed 2000. This place was formerly of great magnificence and strength; for two months it baffled all the efforts of Alexander to take it.

Such are the chief places along the coast from Jaffa to the southern boundary of Palestine. We now take the route inland from Jaffa to Jerusalem.

JAFFA TO JERUSALEM.

About nine miles from Jaffa stands Ramla, or Rameli, the ancient Rama of Ephraim, and very probably the Arimathea of the New Testament. It is situated in a rich plain, and contains about 2000 families. Here there are several convents and mosques; and on a hill to the west of the town stands a venerable ruin, called the Tower of the Martyrs, a name probably derived from the martyrs of Sebastia, in Armenia, whose bodies have been here deposited. About a league from this is Lydda, still called Loudd, where St. Peter cured Æneas of the palsy. This place is now a poor village, with few inhabitants. The country which surrounds it, however, is of a rich and fruitful soil. Farther on is the Arab village of Bethhoor, supposed with much probability by Dr. Clarke to be the Bethoron of Scripture. We enter now into the country of Judea. It is very mountainous; "and its scenery," says Dr. Richardson, "brought strongly to my recollection the ride from Sanquhar to Leadhills, in Scotland; and to those," he continues, "who have visited this interesting part of my native country, I can assure them the comparison gives a favourable representation of the hills of Judea." He goes on to say, that the great difference lies in the contrast which the countries present in the character of their roads and inhabitants, those of Palestine being of the very worst description. Among the places of note which lie in the route to Jerusalem, is Modin, well known as the site of the city and tombs of the illustrious and patriotic Maccabees. It is still a place of strength and goes by the same name. As the road approaches Jerusalem, the vegetation becomes exceedingly scanty, and the country has a bare, rocky, and rugged appearance.

JERUSALEM.

Jerusalem—the city of Zion—the ancient capital of Judea, is situated on the western slope of a rocky hill, at the distance of about forty-five miles eastward from the shore of the Mediterranean. In the present day, it cannot be said to possess any resemblance to its condition in the period of its ancient glory, for the repeated sackings by Persians, Romans, Saracens, and other warlike intruders, also the changes it underwent at the period of the crusades, have obliterated all its original structures; and it now exhibits the external aspect of a Turkish city, with round-topped edifices and mosques, and environed with a wall for its defence. It is now only between two and three miles in circuit; and can be walked round in forty-five minutes. The town is built irregularly, somewhat in the form of a square, has pretty high walls, and six gates, which still bear Hebrew names. The houses are of sandstone, three stories high, and without windows in the lower story. This lifeless uniformity is only diversified here and there by the spires of the mosques, the towers of the churches, and a few cypresses. The population has been variously estimated at from 20,000 to 25,000. "It can hardly," says Mr. Carne, in his letters from the East, "exceed 20,000; 10,000 of these are Jews, 5000 Christians, and the same number Turks. The lower division of the city," he continues, "towards the east, is chiefly occupied by the Jews; it is the dirtiest and most offensive of all. Several of this people, however, are rather affluent, and live in a very comfortable style; both men and women are more attractive in their persons than those of their nation who reside in Europe, and their features are not so strongly marked with the indelible Hebrew characters, but much more mild and interesting. But few passengers in general are met with in the streets, which have the aspect, where the convents are situated, of fortresses, from the height and strength of the walls the monks have thought necessary for their defence. Handsomely dressed persons are seldom seen, as the Jews and Christians rather study to preserve an appearance of poverty, that they may not excite the jealousy of the Turks. The women, in their close veils and white dresses, look like walking corpses. The streets are unpaved, and filled either with heaps of dust or with mire. Nothing is to be seen but veiled figures in white, insolent Turks, and stupid or melancholy Christians." Weavers and slipper-makers are the only artisans. A multitude of relics, which are probably not all manufactured in the city, but are sent in also from the neighbourhood, are sold to the credulous pilgrims. Nevertheless, this city forms a central point of trade to the Arabians in Syria, Arabia, and Egypt. The people export oil, and import rice by the way of Acre. The necessaries of life are in profusion, and quite cheap, the game excellent, and the wine very good. The pilgrims are always a chief source of support to the inhabitants; at Easter they often amount to 5000. But few of them are Europeans. Jerusalem has a governor, a cadi or supreme judge, a commander of the [illegible] and a mufti [illegible] side over religious [illegible]. The citadel, which is pretended to have been the castle of David, is a Gothic building throughout. It is called the Pisan Tower, probably because it was built by the Pisans during the crusades. All the pilgrims go to the Franciscan monastery of the Holy Saviour, where they are maintained a month gratuitously. Besides this, there are sixty-one Christian convents in Jerusalem, of which the Armenian is the largest. They are supported by benevolent contributions, principally from Europe, and form the only place of residence for travellers.

Jerusalem is esteemed by Mohammedans as a holy city, though not to the extent it is by Christians; they

have here a temple or mosque, called the Mosque of Omar, which is on a scale of extraordinary magnificence, and contains a stone supposed to be of miraculous origin. Jerusalem, however, is chiefly of importance to the Turks, from the revenue which is derived from the Christian pilgrims. The spot to which all Christians first direct their attention, is that on which took place the crucifixion and burial of our Lord, now marked by

The Church of the Holy Sepulchre.

Mount Calvary, he spot on which the crucifixion of Christ took place, was originally a rising ground without the walls, but was afterwards enclosed within the city, altered entirely in its outlines, and made the site of a church founded by the Empress Helena. This Church of the Holy Sepulchre, as it is called, is about one hundred paces in length, and sixty in width. It is in the form of a circle, having a heavy dome or cupola, the frame of which is made of the cedars of Lebanon, and covered with a kind of stucco. It has a spacious and magnificent appearance, the Corinthian order of architecture prevailing. The present building is not altogether old. A fire, which occurred in 1808, destroyed a considerable portion of the edifice, and the present structure has been completed in the original style chiefly at the expense of the Greek religionists, who hence possess the best part of the edifice for their religious services, greatly to the distress of the Romish clergy. None of the Protestant churches takes any charge of the place. Carne gives us the following account of his visit to the church:—

"There was a guard of Turks in a recess just within the door, to whom every pilgrim is obliged to pay a certain sum for admission; but we were exempted from this tax. In the middle of the first apartment is a large marble slab, raised above the floor, over which lamps are suspended: this is said to be the space where the body of the Redeemer was anointed and prepared for the sepulchre. You then turn to the left, and enter the large rotunda, which terminates in a dome at the top. In the centre of the floor stands the holy sepulchre: it is of an oblong form, and composed of a very fine reddish stone brought from the Red Sea, that has quite the appearance of marble. Ascending two or three low steps, and taking off your shoes, you enter the first small apartment, which is floored with marble, and the walls lined with the same. In the centre is a low shaft of white marble, being the spot to which the angel rolled the stone from the tomb, and sat on it. You now stoop low to enter the narrow door that conducts you to the side of the sepulchre. The tomb is of a light brown and white marble, about six feet long and three feet high, and the same number in breadth, being joined in the wall. Between the sepulchre and the opposite wall the space is very confined, and not more than four or five persons can remain in it at a time. The floor and the walls are of a beautiful marble; the apartment is a square of about seven feet, and a small dome rises over it, from which are suspended twenty-seven large silver lamps, richly chased and of elegant workmanship—presents from Rome, of the courts and religious orders of Europe; these are kept always burning, and cast a flood of light on the sacred tomb, and the paintings hung over it, one Romish and the other Greek, representing our Lord's ascension, and his appearance to Mary in the garden. A Greek or Romish priest always stands here with the silver vase of holy incense in his hand, which he sprinkles over the pilgrims.

"Wishing to see the behaviour of these people, who come from all parts of the world, and undergo the severest difficulties to arrive at this holy spot, we remained for some time within it; and the scene was very interesting. They entered: Armenians, Greeks, and Catholics, of both sexes, with the deepest awe and veneration, and instantly fell on their knees; some, lifting their eyes to the paintings, burst into a flood of tears; others pressed their heads with fervour on the tomb, and sought to embrace it; while the sacred incense fell in showers, and was received with delight.

"In an apartment a little on the left of the rotunda, and paved with marble, is shown the spot where Christ appeared to Mary in the garden. Near this begins the ascent to Calvary, which consists of eighteen very lofty steps; you then find yourself on a floor of beautifully variegated marble, in the midst of which are three or four slender white pillars of the same material which support the roof, and separate the Greek division of the spot from that appropriated to the Catholics; these pillars are partly shrouded by rich silk hangings. At the end stand two small and elegant altars; over that of the Catholics is a painting of the crucifixion, and over the Greek is one of the taking down the body from the cross. A number of silver lamps are constantly burning, and throw a rich and softened light over the whole of this striking scene.

"The street leading to Calvary has a long and gradual ascent; the elevation of the stone steps is above twenty feet; and if it is considered that the summit has been removed to make room for the sacred church, the ancient hill, though low, was sufficiently conspicuous. The very spot where the cross was fixed is shown; it is a hole in the rock, surrounded by a silver rim, and each pilgrim prostrates himself, and kisses it with the greatest devotion. Its identity is probably as strong as that of the cross and crown of thorns found a few feet below the surface; but where is the scene around or within the city that is not defaced by the sad inventions of the fathers!"

The priests connected with these sacred places keep up a system of religious ceremonies, in some of which it would be impossible to say whether solemnity, fervour, superstition, ignorance, or sheer madness, most predominates. The ceremonies which take place during the season of Easter are ridiculous and absurd in the extreme. Upon Good Friday night the monks enact a sort of drama of the death of our Lord, in which they severally perform the various characters, such as Joseph of Arimathea and Nicodemus. They have a figure of Christ as large as life nailed to a cross, which they carry before them in solemn procession. No circumstance in the awful tragedy is omitted, from the singing of the hymn to the anointing of the body for burial, and its deposition in the sepulchre. The transactions of Easter day partake more of comedy than tragedy. It is a scene of superstitious riot and pitiful absurdity, which we think it unnecessary to describe. The reader may have some idea of it by imagining to himself what would be the consequences if bedlam were let loose upon the holy sepulchre. It is only doing justice, however, to those who have the keeping of the "place where our Lord lay," to observe, that some of the ceremonies are both solemn and impressive, without much admixture of absurdity. It is impossible, however, to read the exhibitions of Easter day and eve, without a painful misgiving as to every thing connected with the holy city.

Mounts Zion and Moriah.

On crossing the small ravine which divides the modern city from Mount Zion, the attention is attracted to three ancient ruins, covered with buildings comparatively modern—said to be, respectively, the house of Caiaphas, the place where Christ held his last supper, and the tomb or palace of David. The first of these is now a church, the services of which are performed by the Armenians: the second presents a mosque and a Turkish hospital while the third, a small vaulted apartment, contains only three sepulchres, formed of dark-coloured stone. This holy hill is equally celebrated in the Old Testament and in the New. Here the successor of Saul built a city and

a royal dwelling; here he kept for three months the ark of the covenant; here the Redeemer instituted the sacrament, which commemorates his death; here he appeared to his disciples on the day of his resurrection. The place hallowed by the last supper, if we may believe the early fathers, was transformed into the first Christian temple the world ever saw, where St. James the Less was consecrated the first bishop of Jerusalem, and where he presided in the first council of the church. Finally, it was from this spot that the apostles, in compliance with the injunction given them, went forth to teach all nations.

A shallow vale, called the valley of Millo, separates Mount Zion from Mount Moriah, on which the temple stood; this was originally an irregular hill, separated from Mount Zion and Acra, as well as from Beretha. For the purpose of extending the appendages of the temple over an equal surface, and to increase the area of the summit, it became necessary to support the sides, which formed a square, by immense works. In order to connect it with Mount Zion, it was necessary to throw a bridge across the valley of Jehoshaphat. According to Josephus, the execrable but magnificent monarch Herod rebuilt the second temple; but there is reason to suppose that he only added considerably to its extent. Its fate is well known: the prediction of our Saviour, that one stone should not be left upon another, was literally fulfilled. After the Caliph Omar took Jerusalem, buildings were erected on the spot where Solomon's temple stood, the rock was enclosed with walls, and, by subsequent additions and embellishments, it became the splendid mosque which we have already described.

Leaving the city at the gate of St. Stephen, the pilgrim is conducted to the spot nearly contiguous where it is supposed he suffered martyrdom. He is then shown the church of the sepulchre of the Virgin Mary, situated in the valley between the Mount of Olives and Jerusalem, founded by St. Helena. This is a small square building, flat on the roof, with a door on the south side, by which there is a descent into the interior by steps, having on the right hand a small chapel, with the tomb of St. Ann, the mother of Mary. On the left is another similar to the former, where Joseph, the husband of the latter, is said to have been interred. Although the authenticity of such assertions depends on the probabilities of tradition, yet the solemn stillness of the place, the sepulchral gloom, and, above all, the associations which are calculated to affect the mind on seeing every object about this city, combine to render a visit to this consecrated spot so deeply interesting, that a traveller of the least sensibility never can forget it.

Mount of Olives.

Passing along a small bridge thrown over the Kedron, the Mount of Olives next presents itself. About halfway towards the summit, there are several grottoes excavated labyrinthically in the rock. Higher up is another cavern, or subterraneous church, as it is now formed, consisting of several arched vaults, where the apostles composed the creed bearing their name; but this is almost filled with rubbish. About fifty yards farther, the spot is pointed out where Christ looked down upon Jerusalem in grief, and pronounced that ever memorable prophecy which has been so awfully and strikingly fulfilled. On the top of the Mount are the remains of a small church or chapel, in the octagon form, with a cupola, denominated the Ascension. This was built by Helena. Here there is shown the impression of the left foot or sandal of a man, which is ten inches in length and four in breadth, made on a rock or stone, said by the guides to be that of Christ, when his foot last touched the earth, though of course this is one of those modern inventions which prevail throughout the country.

Garden of Gethsemane.

The garden of Gethsemane, of all gardens in the world the most hallowed and interesting, is situated at the foot of the Mount, and near the brook Kedron. It is a piece of ground, about the third part of an acre in extent, surrounded by a coarse loose wall of a few feet in height. There are seven olive trees of enormous magnitude remaining, and separate from each other, said to have been in existence since the time of our Lord; they are highly venerated by the Christians, who consider any attempt to cut or injure them as amounting to an act of profanation. Should a Catholic be known to pluck any of the leaves, it subjects him to a sentence of excommunication from church privileges. Beads are made of the stone of the olive, and a string of them is the most sacred object that can possibly be presented to a traveller.

It was to this garden that Christ had occasion to resort with his disciples, to engage in devotional meditation, immediately before his death, and a view of it is calculated to impress the Christian mind with the deepest religious awe. At the upper end is the place where the apostles, Peter, James, and John, fell asleep during the passion of their divine Master, and, in the middle of the garden, the place where Judas betrayed him. Many other interesting places and grottoes are here pointed out, and among them is one which is supposed to be the scene of the agony and the bloody sweat.

Valley of Jehoshaphat.

After leaving the garden of Gethsemane, the traveller enters the valley of Jehoshaphat towards the south, on the eastern side of it. Among the first objects which are pointed out is the pit of Nehemiah, where the avenger of Israel discovered the sacred fire which had been concealed there during the Babylonish captivity. There is also shown the spot where Isaiah is said to have been sawn asunder. A little farther from the scene of the martyrdom, and on the same side of the valley, is the pool of Siloam, so particularly alluded to in Scripture, the water of which is of a brackish, disagreeable taste, and flows several miles distant under the city of Jerusalem, and is emptied here into a sort of basin enclosed by a wall. At a short distance from, and over against the pool, is the "Mountain of Offence," as it is termed, where Solomon committed acts of idolatry, by offering sacrifices to the gods of the Moabites and other nations. Near the foot of it, the Field of Blood is shown, where Judas hanged himself; and beyond it two massy pieces of antiquity, one of which is named the Tomb of Zechariah, and the other that of Absalom, formed in an extraordinary manner out of the natural rock, about eighteen feet in height, and ornamented with some columns of architecture, after the Ionic order, hewn in the same entire stone, supporting a cornice over which rises a pyramidal roof. The latter, since Absalom was not supposed to be buried in the valley, is conjectured to have been formed during the life of that prince. Such is the antipathy of the Jews to this monument, that it is their practice in passing to throw stones against it, as a mark of their reprobation of the unnatural rebellion of Absalom against his father. Near it is the sepulchre of Jehoshaphat, which gives the name of the valley. It is a cavern which is more commonly called the Grotto of the Disciples, from an idea that they went frequently thither to be taught by their divine Master. The front of this excavation has two Doric pillars of small size, but of just proportions. In the interior are three chambers, all of them rude and irregular in their form; in one of which were several gravestones, removed, we may suppose, from the open ground for greater security. Like all the rest, they were flat slabs of a long shape, from three to six inches in thickness, and evidently a portion of the limestone rock which composes the adjoining hills.

Chateaubriand is of opinion, that, except the pool of

Bethesda at Jerusalem, we have no remains of the primitive architecture of its inhabitants. The tombs in the valley of Jehoshaphat display an alliance of Egyptian and Grecian taste, mixed with the peculiar style of the Hebrews. In the valley of Jehoshaphat the Jews have a place of sepulture, which contains a number of gravestones, and to which those who reside in Jerusalem are in the habit of going in procession at certain seasons, for the purpose of observing a religious festival in memory of the dead. There still exists a strong desire in this people to mingle their dust with the ashes of their fathers, and many of them, as well as Christians, entertain the fantastical belief that the valley of Jehoshaphat is to be the scene of the final resurrection. With respect to its present aspect, Chateaubriand beautifully observes, "What with the sadness of Jerusalem, from which there ascends no smoke nor issues any sound—the solitude of the mountains, in which we perceive no living being—and the confusion of the tombs, all broken, shattered, and half open—one could almost believe that the trump of doom had already sounded, and that the dead had begun to rise in the valley of Jehoshaphat."

Besides the places already described in and about the city which tradition has hallowed, are the following:—Beneath the gate of Bethlehem is the spot where Bathsheba was bathing when David beheld her from the roof of his palace, and the present tower of the king is built upon the site of the ancient palace. A small distance within the gate of St. Stephen is the pool of Bethesda. It is one hundred and fifty feet long, and forty broad. The sides are walled with large stones joined together by iron cramps, and covered with flints imbedded in a substance resembling plaster. Here the lambs destined for sacrifice were washed, and here the Saviour said to the paralytic man, "Take up thy bed and walk." It receives a melancholy interest from the consideration that it is the only remnant which remains of Jerusalem as it appeared in the days of Solomon. A wretched street leads from this to the governor's palace, a spacious and rather ruinous building of Roman architecture. It contains some good apartments, the windows of which command an excellent view of the Mosque of Omar and its large area. In this palace the monks point out the room where Christ was confined before his trial; and at a short distance is a dark and ruinous hall, shown as the judgment-hall of Pilate. You then proceed along the street where Christ bore his cross, in which, and in the streets leading up to Calvary, are the three places, where, staggering under the weight, he fell. These are marked by three small pillars laid flat on the ground. The very house of the rich man also is here, and the spot where Lazarus sat at his gate. A pilgrim who comes to the city must set no bounds to his faith, as he is shown the place where the head of Adam was found, the rock on which the martyr Stephen was stoned, and the place of the withered fig-tree, with the milk of the Virgin Mary, and some of the tears that St. Peter wept on his bitter repentance.

In the neighbourhood of Jerusalem, the two chief places of interest are Bethany, lying in a northerly, and Bethlehem in a southerly, direction from the city.

BETHANY.

After leaving Jerusalem by the gate of St. Stephen, crossing the valley of Jehoshaphat, and passing the garden of Gethsemane and the Mount of Olives, the pilgrim arrives at the village of Bethany, situated about two miles from the city, where Jesus once resided, and where he appeared to his disciples after his resurrection. On the road, we meet with the village of Bethpage, now a heap of ruins. Bethany is both small and poor: it is, however, beautifully situated, and the view just above it is very magnificent. The cultivation of the surrounding soil is much neglected. The object which first strikes the traveller, is a ruinous castellated pile, which it is said Lazarus occupied. This, however, is only one of those oral legends, which, being manifestly of such a nature that the alleged fact could never have been ascertained, only affect the traveller with a painful sense of distrust, as he passes through this otherwise interesting country. Not far distant are the ruins of a building, said to have been the house of St. Mark. A little to the right are the vestiges of the habitation of Mary Magdalene. But by far the most interesting object is the tomb of Lazarus. The traveller first descends to a cave, probably from fifty to sixty feet under ground, and lands on a small quadrangular space, where there appears to have been a communication with a church adjoining, which is now built up and converted into a mosque. In the wall of this apartment there is an aperture of about three feet in breadth, formed by the raising of a large stone, as if by some convulsion of nature, and which conducts into an arched vault, said to be the spot where the body was laid. The vault measures about fourteen feet in length, ten in breadth, and eight in height. With respect to the identity of the tomb, Mr. Carne observes, "Its identity cannot be doubted—the position of Bethany could never have been forgotten—and this is the only sepulchre in the whole neighbourhood;"—reasoning which appears by no means conclusive.

BETHLEHEM.

Bethlehem, as being the birthplace of Christ, is one of the most interesting places in the Holy Land. The road leading to it is extremely rocky and barren, only diversified by some cultivated patches bearing a scanty crop of grain, and a profusion of wild flowers. On the way lie the ruined Tower of Simeon, who, upon beholding the infant Messiah, expressed his willingness to leave this world; the monastery of Elias, in which there is said to be a large stone, still retaining an impression of his body; and the tomb of Rachel, rising in a rounded top, like those erected to the memory of a Turkish sultan. Farther on is the well of which David longed to drink, and of which his mighty men, at the imminent risk of their lives, procured a supply. To distinguish this town from another of the same name of the tribe of Zebulun, the Bethlehem we now approach is usually distinguished by the addition of Ephrata, or by a reference to the district in which it is situated. It is a fine village, situated upon a mountain, and surrounded with gardens of fig-trees and olives. The houses are very humble, and flat on the roof, with stairs on the outside.

The principal buildings in Bethlehem are the convent and church of the Franciscans, which cover the supposed spot of the nativity. From the alteration of the surface caused by the building, this celebrated spot is now in a species of vault or subterraneous chapel, called the Chapel of the Nativity. Before the altar in this underground chapel, there are several massy silver lamps kept constantly burning; and the spot where it was said Christ was born, is marked with a star, formed of white marble, inlaid with jasper, and surrounded with a radiance or glory. On this there is encircled the following inscription:—

Hic de Virgine Jesus Christus natus est.
[Here Jesus Christ was born of the Virgin Mary.]

To the right of this is shown the place where stood the manger in which he was laid. It appears to be cut out of the natural rock, and lined with marble. Lamps of silver are always kept burning before it. A narrow passage leads from this chapel into that of the innocents who were slain by the command of Herod, where is a cell, in which, say the monks, St. Jerome made a translation of the Bible. A short distance from the convent is a grotto, where, according to tradition, the mother of Jesus concealed herself and child, whilst Joseph was making arrangements for their flight!

Four miles to the south of Bethlehem, in a most secluded situation in the midst of mountains, are situated

the celebrated pools or fountains of Solomon. These are three in number, of a quadrangular form, cut out of the living rock. About half a mile below, there is a deep valley, embosomed in high hills, where it is said the gardens of Solomon were laid out.

From the top of the church at Bethlehem there is a fine prospect of the surrounding country, extending to Tekoa on the south, and En-gedi on the east. In the latter place is the grotto or cave of Adulam, where David cut off the skirt of Saul's garment. Between this point and Jerusalem are several small detached towers, of a square form, built in the midst of vine-lands. These are for the accommodation of watchmen appointed to guard the produce from thieves and wild beasts, as alluded to by the evangelist St. Mark.

About twenty miles south from Bethlehem is Mount Hebron, with the town of that name, one of the oldest cities of Canaan, but now containing only 700 or 800 Arab families. The present inhabitants are the wildest, most lawless, and desperate people of the Holy Land. The principal mosque is said to contain the tombs of Abraham, Isaac, and Jacob; being in the possession of bigoted Mussulmans, no examination can be made of these supposed objects of antiquity.

CAVE OF JEREMIAH.

The central district of Palestine, northward from Jerusalem, contains a few objects of interest to travellers. The first which attracts their attention is the cave of Jeremiah, situated at a short distance from the gate of the Holy City. The bed of the prophet is shown in the form of a rocky shelf, about eight feet from the ground; and the spot is likewise pointed out on which he is understood to have written his book of Lamentations. At a little distance from the city stand the sepulchres of the kings, connected with which there still prevails some obscurity. But whoever was buried here, the place discovers so great an expense, both of labour and treasure, that we may well suppose it to have been the work of kings. It is approached on the east side by an entrance cut out of the rock, which opens into a court of about forty paces square. On the south side is a portico nine paces long and four broad, likewise hewn out of the living rock, and having an architrave running along its front adorned with sculpture. In the interior there are six or seven rooms in which stone coffins are exhibited.

BEER, LEBONAH, AND THE MOUNT OF GERIZIM.

The next object of importance which we meet with is a village supposed to be the Mickmash alluded to in Scripture. It is at present distinguished by the name of Beer, signifying a well, and adopted, most likely, from a delicious spring of water flowing through it; near to which are the ruins of a church, built in commemoration of the missing of Jesus by his parents, on their way home from Jerusalem, when it was discovered that he had remained in the temple with the expounders of the law. It was to this place, also, that Jotham had recourse in order to escape the fury of his brother. Beyond this hamlet, at the distance of about four hours' walk, is Leban, called Lebonah in the Bible, a village situated on the eastern side of a delicious vale. The road between these two places is carried through a wild and very hilly country, destitute of trees or other marks of cultivation, and rendered almost totally unproductive by the barbarism of the government. In a narrow dell, formed by two lofty precipices, are the ruins of monastery, being in the neighbourhood of that mystic Bethel where Jacob enjoyed his celestial vision. We next arrive at the well of that patriarch, the scene of the conference between our Saviour and the woman of Samaria. Over this fountain Helena erected a large edifice, of which, however almost nothing now remains. Near this is the narrow valley of Secasm, the Sychar of Scripture, overhung on either side by the two mountains Gerizim and Ebal, memorable as being the theatre on which was pronounced the sanction of the divine law. The Samaritans have, as is well known, a place of worship on Mount Gerizim, where at certain seasons they perform the rites of their religion. According to their version of the Pentateuch, it was here that the Almighty commanded the children of Israel to set up great stones covered with plaster, on which to inscribe the body of their law, to erect an altar to offer peace-offerings; and to rejoice before the Lord their God. In the Hebrew edition, Mount Ebal is said to have been the scene of these pious services—a variation which the Samaritans ascribe to the malice of the Jews. In the vicinity of the town is a small mosque, which is said to cover the sepulchre of Joseph, and to be situated in the field bought by Jacob from Hamor, the father of Shechem, as is related in the book of Genesis.

NABLOUS OR SHECHEM, AND SAMARIA.

Penetrating farther northwards, we arrive at a rich and fertile district, in which is situated Nablous, the ancient Shechem, and at present one of the most flourishing towns in the Holy Land. It has a very imposing appearance when viewed from the surrounding heights, and looks as if it were embosomed in a delicious paradise. The population, who are principally Mohammedans, have been estimated at 10,000, but this Mr. Buckingham thinks an exaggeration.

The Samaritans do not exceed forty in number. They have a synagogue, where divine service is performed every Saturday. Four times a year they go in solemn procession to the old temple on Mount Gerizim, on which occasion they assemble before sunrise, and read the law till noon. They have but one school in Nablous where their language is taught, though they take much pride in preserving ancient manuscripts of their Pentateuch in the original character. Mr. Conner saw, a copy which is reported to be 3500 years old, but he was not allowed to examine nor even to touch it. The events transacted in the field of Shechem render the localities contiguous to this city peculiarly interesting. Here stands the well of Jacob, and here the sons of the patriarch "drove their flocks a-field," and here they sold to the Ishmaelites their brother Joseph, the future all but potentate of the greatest kingdom then upon the face of the earth. Here, as of old, the shepherds graze their flocks upon the hills of Samaria, and the Ishmaelites come from Gilead, "bearing spices, and balm, and myrrh"—so enduring are the customs and manners of the east.

A few miles beyond Nablous, and about forty from Jerusalem, is situated the town of Samaria. This situation is extremely beautiful, and naturally strong, occupying the summit of a hill, encompassed all around by a deep valley. But the city which Herod adorned with princely buildings is now a mere village, small and poor, exhibiting only the miserable wreck of former greatness. Here John the Baptist was decapitated, and the Empress Helena erected a church over the place where he pined and suffered; but it has shared the fate of the rest of the city, being now a mere ruin. The prison where the holy blood of the desert-bred was spilled, is, however, pointed out by the Turks, who hold it in high veneration.

THE DEAD SEA.

This extensive sheet of water lies in an easterly direction from Jerusalem, and also from Bethlehem. In proceeding towards it from the latter place the traveller goes through a vale where it is said Abraham was wont to feed his flocks. This pastoral plain is succeeded by a range of mountainous and barren ground. Descending from this, two lofty towers rise from a deep valley, marking the site of the Convent of Santa Saba, a very an-

cient church. Its situation is dreary, being built amidst precipices on the brink of a deep and gloomy dell, where the brook Kedron flows.

In advancing, the country still presents a desolate aspect. The road at length seeks a lower level, and approaches the rocky border which bounds the valley of the Jordan; when, after a toilsome journey of ten or twelve hours, the traveller at last beholds the Dead Sea, and the line of the river; the landscape, however, is by no means grand or prepossessing. Two long chains of mountains run in a parallel direction from north to south, without breaks and without undulations. The eastern or Arabian chain is the highest; and when seen at the distance of eight or ten leagues, it resembles a prodigious perpendicular wall. Not one summit, not the smallest peak, is distinguishable; only slight inflections are here and there observed, as if the hand of the painter who drew this horizontal line along the sky had trembled in some places. The mountains of Judea form the range on which the observer stands as he looks down on the lake Asphaltites; it is less lofty and more unequal than the eastern chain, and also differs from it in its nature; exhibiting heaps of chalk and sand, which assume various bizarre forms. The Arabian side, on the contrary, presents nothing but bleak precipitous rocks, which throw their long and gloomy shadows over the water of the Dead Sea. Not a single blade of grass is to be found among these crags; every thing announces the country of a reprobate people, and well fitted to perpetuate the doom pronounced on Ammon and Moab. The valley embosomed in these two chains of mountains displays a soil similar to the bottom of a sea which has long retired from its bed—a beach covered with salt, dry mud, and moving sands, furrowed as it were by the waves. Vegetation is here in a deplorable state: there are a few dreary shrubs, with leaves covered with salt, and a bark which has a smoky smell and taste. Instead of villages, you perceive the ruins of a few towers. In the middle of this valley flows a discoloured river, which reluctantly throws itself into the pestilential lake by which it is engulfed. Its course amid the sand can be distinguished only by the willows and the reeds that border it; among which the Arab lies in ambush to attack the traveller, and to murder the pilgrim.

We now come to the lake itself, called in Scripture the Dead Sea; among the Greeks and Romans, Asphaltites; and among the Arabs, Bahr Lout, or the Sea of Lot. Considerable diversity of opinion has prevailed, both among the ancients and moderns, regarding the exact dimensions of this lake, which as yet are probably not accurately ascertained. Mr. Carne says, its length may probably be about sixty miles, and its average breadth eight. Mr. Banks, however, who took observations from several neighbouring heights, says, that its utmost extent does not exceed thirty miles. This discrepancy places the inaccuracy of travellers, with regard to their topographical descriptions of Palestine, in a very strong point of view. It is surrounded on the east by lofty hills, exhibiting rugged and frightful precipices; on the north it is bounded by the plain of Jericho, through which it receives the river Jordan. Other streams are discharged into it; and there being no visible outlet, while the banks are not overflowed, some have thought there is a subterraneous channel communicating with the Mediterranean: others readily account for the phenomenon, in the evaporation which necessarily takes place in a hot climate. This lake is clear and limpid, resembling the colour of the sea. Its waters are in general fatal to animal life, nor do vegetables flourish in their immediate vicinity. The fishes carried hither by the river Jordan, according to the concurring testimony of travellers, speedily perish; but the latest observers affirm that there are some small ones in the lake peculiar to itself, as also that a few inferior vegetables may be seen in it.

Travellers on bathing in the lake find their faces covered with a thin crust of salt, and the stones which the water occasionally covers, are encrusted with the same substance. From whatever cause, the water is different from that of other lakes or seas. On being analyzed, it is found to have a greater specific gravity, or power of buoying up bodies, than any other water. It holds in solution muriate of lime, muriate of magnesia, muriate of soda, and sulphate of lime; of all these there are 24 grains in 100 grains of water.

Great quantities of asphaltum, or mineral pitch, are always seen floating on the surface of the Dead Sea, and it is driven by the winds to the banks on the east and west; but the statement that a pestilential effluvium hovers over it is doubtful. Mr. Carne informs us that there is nothing of the kind. The neighbourhood of the lake abounds with volcanic products; and although eruptions have ceased for many centuries, earthquakes are still common in Syria and Palestine.

The Dead Sea is associated with that dreadful catastrophe recorded in Scripture, the destruction of Sodom and Gomorrah. With respect to the agents employed for executing the purpose of Divine vengeance, various conjectures have been hazarded—some suppose that the great cities were swallowed up by a volcano. The opinion of Chateaubriand, who had carefully examined several volcanoes, is decidedly opposed to this theory. The learned Frenchman inclines to the opinion of Michaelis and Busching, that Sodom and Gomorrah were built upon a bituminous mine; that lightning kindled this combustible mass; and that the cities were engulfed in this subterraneous conflagration. Malte-Brun ingeniously supposes that the stones of which the towns themselves were built might be bituminous, and thus have been kindled by the fire of heaven. These views appear very plausible, when taken in connection with the Mosaic account of the place, that the vale of Siddim, which is now occupied by the Dead Sea, was full of "slime pits," or pits of bitumen. There can be no doubt, however, that combustible matter descended from heaven upon the devoted cities of the plain, for the language of the Scriptural account is precise and explicit: "The Lord rained upon Sodom and Gomorrah brimstone and fire from heaven." According to Strabo, there were thirteen towns swallowed up in the lake Asphaltites; Stephen of Byzantium reckons eight; the book of Genesis, although it names five as situated in the vale of Siddim, relates the destruction of two only; four are mentioned in Deuteronomy, and five are noticed by the author of Ecclesiasticus. A considerable difference of opinion exists respecting the probable outlet of the waters of the Jordan, previous to the catastrophe which destroyed Sodom and Gomorrah, and created the Dead Sea on their site. Buckhardt and others allege, that the Jordan must have proceeded along the plain of Sodom, and pursued a course through the wilderness to the Gulf of Akaba, or eastern limb of the Red Sea; indeed no other probable outlet could be assigned. Other travellers who have scrupulously examined the district, and taken its levels mathematically, declare that the surface of the Dead Sea is several hundred feet below the level of the Gulf of Akaba, and much more below that of the Mediterranean. If this be the case, the land on which the Dead Sea rests, and also the present termination of the Jordan, must have been sunk at least 1000 feet on the occasion of the awful catastrophe which laid the "cities of the plain" in ruins, and covered them with a waste of bitter waters.

THE RIVER JORDAN.

The river Jordan, which flows into the Dead Sea at its northern extremity, rises at the foot of the mountains of Lebanon, and has altogether a course of 150 miles For the last two or three miles, it runs between perpen

dicular banks of sand, from five to ten feet high, and here the river is about thirty paces broad. A few miles from its mouth, on the right side, and at a short distance from the stream, is the site of Jericho, now consisting only of a few miserable huts and a watch-tower. At this point of the river is the spot where the Israelites crossed from the Arabian side into Palestine, under the command of Joshua. Passing up the vale of the Jordan, for a distance of ninety or one hundred miles, with the land of Gilead, as it is called, on the right, the traveller arrives at the Lake of Genesareth, near which are a number of places mentioned in the narrative of Christ's ministrations.

LAKE OF GENESARETH.

This sheet of water, which is an expansion of the Jordan, passes under various names from the sacred writers, such as the Sea of Galilee, Lake of Tiberias, and Lake of Geneser or Genesareth. The river Jordan enters at the northern and flows out at the southern extremity, and its course is visible all the way through. The range of mountains forming its eastern shore, is very lofty, and their steep and rocky sides are barren; the western shore, where the town stands, is lower; the hills are picturesque, and divided by sweet valleys clothed with verdure, but destitute of trees. With respect to the size of the lake, we must choose again among conflicting statements. It seems to be about fifteen miles in length and five in breadth. The waters are perfectly sweet and clear, and the fish are said to be of a delicious flavour.

It is almost unnecessary to remind the reader that this lake and neighbourhood were the scene of many important events recorded in the New Testament. Here, it will be remembered, Christ embarked in a ship, to go to different places about its borders, in the prosecution of his errands of mercy, and from which he instructed the multitude who had assembled on the shore.

Capernaum lies at the upper end of the lake, and is now called Talhewin, or Tel Hoom. It is nothing more than a station of Bedouins, but there are traces of its former importance. The foundations of a magnificent but now much dilapidated edifice can still be traced.

Tiberias, which makes a conspicuous figure in the Jewish annals, is situated on the western side, and is the only place on the sea of Galilee retaining any marks of its ancient importance. It is understood to cover the ground formerly occupied by a town of a much remoter age, and of which some traces can still be distinguished. Tabaria, as it is now denominated, has the form of an irregular crescent, and is enclosed towards the land by a wall, flanked with circular towers. It lies nearly north and south along the edge of the lake, and has its eastern front so close to the water, on the brink of which it stands, that some of the houses are washed by the sea. The whole does not appear more than a mile in circuit, and cannot, from the manner in which they are placed, contain above 500 separate dwellings. Here there are a mosque and two Jewish synagogues, also a Christian place of worship, called the house of Peter, which is thought by some to be the oldest building used for that purpose in any part of Palestine. The structure is of very ordinary description; but it derives no small interest from the popular belief that it is the very house which Peter inhabited at the time of his being called from his boat to follow the Messias. The population of the town does not now exceed 2000. Of these, about one-half are Jews; the rest are Mohammedans, with the exception of a few of the Christian creed. The warm baths, which have given celebrity to that neighbourhood, are still found at the distance of between two and three miles southward from the town.

MOUNT TABOR.

An almost uninterrupted ascent, in a south-westerly direction, conducts from Tiberias to Nazareth. On this route, we have on our left Mount Tor, or Tabor. This mount, which is classed in Scripture with Hermon, and is of a sugar-loaf shape, stands apart from the neighbouring mountains, is at one end of the great plain of Esdraelon. It may be ascended on all points, excepting towards the north, where it is rugged. There is not, perhaps, to be found, in the whole compass of the globe, one spot, from which a believer in the gospel can possibly enjoy a more sublime or glorious prospect, than from the summit of Mount Tabor. In the first place, there is presented to view an extensive plain, on one side of which, on the left hand, are the mountains of Samaria, towards Jerusalem; on the other, to the right, those about Nazareth, especially the memorable hill from which the Jews attempted to precipitate Christ. At the opposite extremity of this plain, is the top of Mount Carmel, washed by the ocean. In another direction, we see Hermon in its lofty dignity; Endor, and Nain, with the mountains of Gilboa; the valley of Jordan; the spacious plains of Galilee, with its sea of Genesareth, and its enclosure of mountains; Dothan, where Joseph was sold, with its rivers, valleys, and little hill; and the village of Saphet, anciently called Bethulia, on an eminence, and presumed to have been the point of elevation alluded to by Christ in his sermon on the mount, from which it is also remarkably conspicuous, and not at a great distance. Again, the sublime height on which he delivered this memorable oration; the route to Damascus; lastly, Mount Lebanon, towering with prodigious alpine dignity in the background.

Different opinions have been entertained by writers with regard to the extent of ground on the summit of Tabor, and the cultivation of it. Taking the whole into calculation, it may be nearly two miles in diameter. To the west, there are masses of scattered ruins. At one period, a governor of Galilee surrounded the top of it with walls, which is confirmed by the scattered fragments still to be seen. St. Helena, also, in prosecution of her zeal in the cause of Christianity, founded two monasteries, one to the memory of Moses, and the other of Elias. Various historical incidents are connected with this mountain. Here it was that Barak, descending with his ten thousand men from Tabor, discomfited Sisera and all his chariots. In the same neighbourhood, Josiah king of Judah fought in disguise against Necho king of Egypt, and fell by the arrows of his antagonist, deeply lamented. Vespasian reviewed his army in the same great plain. It has been a chosen place for encampments in every contest carried on in the country, from the days of Nebuchadnezzar, king of the Assyrians, down to the disastrous invasion of Napoleon Bonaparte.

NAZARETH.

A short way to the north-west of Mount Tabor is situated the village of Nazareth, on the western slope of a delightful valley, and encompassed by rocky mountains; the distance from Jerusalem is about one hundred miles. The place is properly named Nazareth of Zebulun. The inmates of a convent at the eastern extremity of the village, conduct travellers to a number of spots in the neighbourhood of scriptural interest, but greatly changed in their appearance in modern times. The first thing to which attention is directed is the church belonging to the convent, which is rather elegant, and is erected over the grotto or cave where Mary took up her abode. It has no other roof than that which is formed of the natural rock, and is in the shape of a cross.

Among many pictures which adorn this church, there is a pretended likeness of Christ.

The second object shown is the shop where Joseph worked; it is now used as a place of worship. Over the altar, he is represented with the implements of his trade

holding our Lord by the hand, as if in the act of imparting the knowledge of his vocation.

Thirdly, a chapel, in the centre of which is an enormous stone, about nine feet in length, and six in breadth, on which it is affirmed that Christ sat and ate with his chosen few.

Fourthly, the synagogue where Christ, agreeably to his practice, read to the Jews, from the sacred volumes, on the Sabbath.

Fifthly, near the town is pointed out a hill, from which, disregarding the sanctity of that day, they threatened to throw him, in consequence of the dissatisfaction which his addresses had given.

And, lastly, a well of the Virgin, which supplies the inhabitants of Nazareth with water. Mr. Carne says, the population may amount to about 1200, and are mostly Christians.

After crossing the plain of Esdraelon, we come to Mount Hermon, the dew of which is so beautifully alluded to by the Psalmist. Near this place stands Nain, which is so called from its pleasant situation, where the widow's son was restored to life. About two miles from Nain, is seen Endor, where the sorceress resided who was consulted by Saul, and in the vicinity are the mountains of Gilboa, where the forces of Israel were collected.

A few miles northward from Nazareth, is

CANA OF GALILEE.

This village, which was the scene of the earliest miracle performed by our Lord (the conversion of the water into wine at the marriage feast), is pleasantly situated on a small eminence in a valley, and contains 200 or 300 inhabitants. Many pots, answering to the description given by the Evangelist, are found lying about amongst the ruins; from which it would appear evident, that the practice of keeping water in large stone pots, each holding from eighteen to twenty-seven gallons, was once common in the country. Near the bottom of a field, which is said to be that in which Christ plucked the ears of corn upon the Sabbath, stands the Holy Mount, which has been so eminently distinguished as the spot from whence the multitudes were addressed. It has an elevation of from 200 to 300 feet.

The landscape, which stretches from the lake of Tiberias to the sources of the Jordan, is in many parts uncommonly fine, presenting luxuriant crops, thriving villages, and other tokens of security and comfort. The mountains that terminate the prospect are magnificent, some of them being covered with perpetual snow.

SAPHET, SEPHOURI, AND ZEBULUN.

The only town of consequence between the ruins of Capernaum and the alpine range of Hermon and Djibbel d Sheik, is Saphet or Zaffad, being one of the four cities consecrated by the religious veneration of the Hebrews. According to Burckhardt, it stands upon several low hills that divide it into quarters, the largest of which is occupied by Jews. The whole may contain 600 houses, of which 150 belong to the people just named, and nearly as many to the Christians. The summit of the principal eminence is crowned with an ancient castle, part of which is regarded by the descendants of Israel as being contemporary with their ancient kings. The Jews have here seven synagogues, and a sort of university for the education of their rabbis. Their attachment to this place arises especially from the traditionary belief, that the Messias is here to reign forty years before he assumes the government at Jerusalem. From Nazareth to Acre we proceed over a barren rocky tract of country; on the way we meet with Sephouri or Sepphoris, the Zippor of the Hebrews, and the Diocesarea of the Romans, once the chief town and bulwark of Galilee. The remains of its fortifications exhibit one of the works of Herod, who, after its destruction by Varus, not only rebuilt and fortified it, but made it the principal city of his tetrarchy.

Its chief celebrity is connected with the tradition that it was the residence of Joachim and Anna, the parents of the Virgin Mary. Constantine built a magnificent church over the spot where the devout couple lived. The vale of Zebulun divides the above village from the ridge of hills which look down on Acre and the shores of the great sea. This plain everywhere presents the most beautiful scenery. On the road, various ruins occur which exercise the ingenuity of the antiquarian traveller. All remains of the strong city of Zebulun have disappeared, and its admirable beauty, rivalling that of Tyre, Sidon, and Berytus, is now sought for in vain among Arab huts and heaps of rubbish. We shall now proceed in a westerly direction to the coast of the Mediterranean, to describe those points of interest lying to the north of Acre.

TYRE.

Tyre (now called Tsour), which is situated on the coast about twenty miles north from Acre, and anciently belonging to the Phœnicians, is renowned in Scripture as a mighty mercantile stronghold, encompassed with walls and towers. Perhaps, of all other maritime cities in the globe, this was the most highly renowned for riches and commerce, since its very merchants were declared to be as princes, and "every deck a throne." A most interesting description of the trades carried on within its walls has been transmitted to us in the 27th chapter of Ezekiel. It was not, however, merely in a commercial point of view that it was represented to the world at large as an object of wonder and admiration. Among the variety of trades exercised in this city, that of dyeing was most distinguished, on account of the beautiful purple tint which poets have celebrated as a chief ingredient in the magnificence of the vestments worn by the principal inhabitants. During the time of our Saviour, considerable importance must have been attached to the city, as it is frequently alluded to, with its neighbourhood. Tyre was besieged and taken by Alexander the Great, after whose death it began to recover, and maintain a commercial character. It afterwards submitted, first, to the Roman, and afterwards to the Mohammedan yoke, under the power of which it now remains. It was enclosed with walls, which originally must have been of great strength, furnished with towers, having holes or apertures for making observations, part of which still remain. In the present day it exists as a small decayed town at the outer extremity of a low sandy peninsula, and a recent traveller mentions that he saw only a single boat in its harbour.

SIDON.

Sidon, or Zidon, called by the Arabs Tsaida, is situated on the coast at about twenty miles northward from Tyre. It owes its name to the eldest of the sons of Canaan, and was comprehended under the "lot," or possessions, formally assigned to the tribe of Asher. It appears to have been higher in point of antiquity than Tyre, although both have been classed in the character of sisters, arising, most likely, from their contiguity, and publicly considered as a city of large extent and importance, since it has been distinguished in Scripture by the title of "Zidon the Great." The invention of the alphabet and arithmetic, making of glass, and skill in casting and sculpture, have been celebrated; and an unrivalled dexterity in hewing of wood will hand down the Sidonian name in the page of history to the latest period of time. The commercial pursuits of this people were also as lucrative as they were extensive; and it was likewise celebrated for its maritime enterprise.

Sidon is now a small town, rising gradually from the

sea-shore, very pleasantly situated, and surrounded with rich gardens. The climate is peculiarly mild: the streets are excessively narrow, many of them under archways as at Jerusalem: the inhabitants are estimated at about 7000, of whom 2000 are Christians, who have places of worship; the Jews, also, who may be calculated at 200, have a synagogue. Considering its small extent, the trade of this place is considerable, particularly in silk.

The next object of importance, in a northerly direction, is

MOUNT LEBANON,

"Whose head in wintry grandeur lowers,
Whiten'd with eternal sleet;
While summer, in a vale of flowers,
Is steeping rosy at his feet."

This mountain has received the appellation of Lebanon from the word *Leban*, signifying white, and, in all probability, from the snow which remains on its heights during the whole year. It has afforded many glowing images and beautiful metaphors to the sacred writers. Its cedars, alluded to in ancient prophecy, have in all ages been celebrated as fine objects. It may be further added that, uniting so many qualities for building, many of these trees were sent by King Hiram to Solomon for the erection of his temple. Lebanon is variously described as rising to 9600 and to 11,000 feet. At one spot is found a grove of cedars, and other parts of the mountain are beautified with thousands of rare plants.

THE DRUSES AND MARONITES.

The mountains of Lebanns and neighbourhood are inhabited by two races, differing in religion and manners, but similar in their love of independence, the Maronites and the Druses. The country of the former is called Kesraoun, the Castravan of the historians of the crusades. It reaches from the river Kebir to the Kelb. The Maronites, amounting to 120,000, dwell in villages and hamlets. The fervour and devotion which animate this people recall to us the ideas of the primitive church. An imposing superstition has consecrated a cedar forest which is said to have furnished the timber of Solomon's temple. Only twenty large cedars remain, and this old vegetable race verges fast to its extinction. Every year, on transfiguration day, the Greeks, the Armenians, and the Maronites, celebrate a mass on an altar of rough stones raised at the roots of these venerable trees.

The Druses, also 120,000 in number, live to the south of the Maronites. Their country has several subdivisions, differing from one another in their soil and productions. It is by religious peculiarities that this people is separated from the other inhabitants of Syria. They believe in one God, who, for the last time, showed himself in human form in the person of Hakem, caliph of Egypt, in 1030. Persuaded that all other systems of belief will finally be united in that which they profess, they regard them all with equal indifference, although the Christians have considered them as entertaining a marked contempt for the Mohammedan religion. Recent travellers have described the Maronites and Druses as an inoffensive primitive people.

In a northerly direction from Sidon, the only port of any consequence on the Mediterranean is Beirout.

BALBEC AND DAMASCUS.

Having reached Mount Lebanon, at the northern extremity of Palestine, travellers generally spend a few days in making a journey to Balbec and Damascus, both lying beyond the frontier of the Holy Land, but still of great historical interest. Balbec, the ancient Heliopolis, and once distinguished for its beautiful Grecian and Roman architecture, is now completely in ruins. These, however, are of the most magnificent kind, and consist of detached columns, façades of temples, and other elegant blocks of destroyed buildings.* Balbec is now uninhabited, except by wandering Arabs. Damascus, situated near the confluence of the rivers Abnia and Pharphar of Scripture (see map), is an ancient town in Syria, built in the eastern style, and, with the surrounding country, is again in the possession of the Sultan.

Damascus is enlivened by the bustle of commerce, and the passage of the caravans to Mecca. The great street which crosses it presents two rows of shops, in which the riches of India glitter along with those of Europe. Damascus is seven miles in circumference, and at present the population may amount to 100,000. The private houses in Damascus, simple in external appearance, exhibit in the interior all the splendour and elegance of a refined luxury; great magnificence is also displayed in the mosques, the churches, and the coffee-houses. The large mosque is a fine and spacious building, but no traveller is permitted to enter. The Chan Verdy, or Coffee-House of Roses, is considered as one of the curiosities of the Levant. Various places associated with events mentioned in Scripture, are pointed out in the city and neighbourhood. The street, still called Straight, is that where St. Paul is, with reason, said to have lived. It is as straight as an arrow, a mile in length, broad, and well paved. A lofty window, in one of the towers to the east, is shown as the place where the apostle was let down in a basket; and in the way to Jerusalem is the spot where his course was arrested by the light from heaven.

* For an account of the ruins of Balbec, see Lamartine's Travels in the East, page 113; People's edition.

ARABIA PETRÆA.

Arabia Petræa, or Arabia the Rocky, is the most northerly part of the peninsula of Arabia, and includes the territory lying between the Mediterranean and the two upper extremities of the Red Sea. These extremities form two gulfs—the Gulf of Suez, which is the largest, and the Gulf of Akaba. The Gulf of Suez is adjacent to Egypt, and between it and that of Akaba there is an angular tract of country, in which is situated the wilderness of Sinai. The whole of this territory, from the borders of Egypt to near the Dead Sea in Palestine, and from the Red Sea to the Mediterranean, is little else than an universal desert of rocky mountains and sandy plains, almost destitute of any settled human habitations, and inhabited only by roving bands of Arabs or Bedouins (children of the desert), whose hand is against every man, and every man's hand against them. Anciently, the country, which was called in its more northerly part the land of Edom or Idumea, was mostly fertile and productive, but by the encroachments of the sands of the deserts and the desolation which has otherwise spread over it, the land is generally barren, and mostly in the condition of a wilderness. Till this hour, the curse of God, as enunciated by the prophet Isaiah, rests upon it—"From generation to generation it shall lie waste; none shall pass through it for ever." With the exception of a few French and English travellers who have within the last twenty years passed through Idumea, from Akaba to Jerusalem, the prophecy has been fulfilled.

According to the accounts of recent travellers, nothing can exceed in rugged grandeur the desolate region of Sinai and Mount Horeb. Rocks piled on rocks to an immense height, precipitous cliffs, and bare desolate valleys, fill up the melancholy scene. On the face of Sinai, a fortified monastery is placed, for the accommodation of Christian pilgrims and travellers. The ascent of the mountain commences above the monastery, and

in this direction it was climbed by Mr. Stephens, who reached the top with some difficulty, and saw around him a terrific solitude, a perfect sea of desolation. "Not a tree, or shrub, or blade of grass, is to be seen upon the bare and rugged sides of innumerable mountains, heaving their naked summits to the skies. The level surface of the very top or pinnacle, is about sixty feet square. At one end is a single rock about twenty feet high, on which, as said the monk [my conductor] the spirit of God descended, while, in the crevice beneath, his favoured servant [Moses] received the tables of the law. The ruins of a church and convent are still to be seen upon the mountain, to which, before the convent below was built, monks and hermits used to retire, and, secluded from the world, sing the praises of God upon his chosen hill. Near this, also in ruins, stands a Mohammedan mosque—for on this sacred spot the followers of Christ and Mohammed have united in worshipping the true and living God."

The route from Sinai towards the land of Edom is by way of Akaba, a small fortified town at the head of the Gulf of Akaba, or Elanitic branch of the Red Sea. The journey is through a rocky desert, "with here and there (says Mr. Stephens) a fertile spot, near some fountain or deposit of water, known only to the Arabs, capable of producing a scanty crop of grass to pasture a few camels and a small flock of sheep or goats. There the Bedouin pitches his tent, and remains till the scanty product is consumed; and then packs up his household goods, and seeks another pasture-ground. The Bedouins are essentially a pastoral people; their only riches are their flocks and herds, their home is in the wide desert, and they have no local attachments; to-day they pitch their tent among the mountains, to-morrow in the plain; and wherever they plant themselves for the time, all that they have on earth, wife, children, and friends, are immediately around them. In fact, the life of the Bedouin, his appearance and habits, are precisely the same as those of the patriarchs of old. Abraham himself, the first of the patriarchs, was a Bedouin, and 4000 years have not made the slightest alteration in the character and habits of this extraordinary people. Read of the patriarchs in the Bible, and it is the best description you can have of pastoral life in the East at the present day.

"Akaba (continues this writer) is situated at the foot of the sandstone mountains, near the shore, and almost buried in a grove of palm-trees, the only living things in that region of barren sands. It is the last stopping place of the caravan of pilgrims on its way to Mecca, being yet thirty days' journey from the tomb of the Prophet, and, of course, the first at which they touch on their return. Except at the time of these two visits, the place is desolate from the beginning of the year to its close; the arrival of a traveller is of exceedingly rare occurrence, and seldom does even the wandering Bedouin stop within its walls; no ship rides in its harbour, and not even a solitary fishing-boat breaks the stillness of the water at its feet. But it was not always so desolate, for this was the Eziongeber of the Bible, where, 3000 years ago, King Solomon made a navy of ships, which brought from Ophir gold and precious stones for the great temple at Jerusalem; and again, at a later day, a great city existed here, through which, at this distant point of the wilderness, the wealth of India was conveyed to imperial Rome. But all these are gone, and there are no relics or monuments to tell of former greatness; like the ships which once floated in the harbour, all have passed away. Still, ruined and desolate as it is, to the eye of feeling the little fortress is not without its interest; for, as the governor told me, it was built by the heroic Saladin.

"Standing near the shore of this northern extremity of the Red Sea, I saw before me an immense sandy valley, which, without the aid of geological science, to the eye of common observation and reason had once been the bottom of a sea or the bed of a river. This dreary valley, extending far beyond the reach of the eye, had been partly explored by Burckhardt; sufficiently to ascertain and mention it in the latest geography of the country as the great valley of El Ghor, extending from the shores of the Elanitic Gulf to the southern extremity of the Lake Asphaltites or the Dead Sea; and it was manifest, by landmarks of Nature's own providing, that over that sandy plain those seas had once mingled their waters, or perhaps, more probably, that before the cities of the plain had been consumed by brimstone and fire, and Sodom and Gomorrah covered by a pestilential lake, the Jordan had here rolled its waters. The valley varied from four to eight miles in breadth, and on each side were high, dark, and barren mountains, bounding it like a wall. On the left were the mountains of Judea, and on the right those of Seir, the portion given to Esau as an inheritance; and among them, buried from the eyes of strangers, the approach to it known only to the wandering Bedouins, was the ancient capital of his kingdom, the excavated city of Petra, the cursed and blighted Edom of the Edomites. The land of Idumea lay before me, in barrenness and desolation; no trees grew in the valley, and no verdure on the mountain tops. All was bare, dreary, and desolate."

Pursuing a route through this dreary tract of wilderness, and on approaching Mount Hor, on the summit of which is a small sepulchral edifice, said to be erected over the tomb of Aaron, the traveller turns aside to the right, and, in the bosom of the mountains, reaches the ancient city of Petra, the Edom of the Edomites, now entirely deserted by human beings, but still presenting to the eye a most wonderful spectacle. It is a city whose houses and temples are cut out of the face of the solid rocks. Petra was the capital of the Edomites, and the centering point of commerce between the Red Sea and the higher part of Syria. Ultimately, it fell under the sway of the Romans, by whose architectural genius it was greatly enriched; its final destruction was only a part of the universal ruin which overtook the Syrian cities by the intrusion of barbarian hordes. Of its present aspect, "conceive (says Mr. Roberts, a late traveller) a town with the most noble mansions excavated in the face of perpendicular rocks, varying from five hundred to a thousand feet in height, and that to an extent of six or eight miles in all directions; the valleys or narrow ravines forming the streets, with lanes winding over from one to the other to the height I mention. The centre of the main valley had originally been occupied by houses built in the usual way, but repeated earthquakes levelled all in one common mass of ruin. There is now a city fortified by nature, such as never city was before or since, surrounded by mountains, the only passage of entrance through which is by a ravine so narrow that two camels can scarcely enter abreast. While the city was inhabited in ancient times, the hills around were cultivated to the very summit; there was a stream of delicious water flowing through it, and the population must have been immense." One of the most beautiful and perfect of the excavated edifices is that called the *Khasne Faraoun*, or Treasury of Pharaoh; an idea of its appearance, cut out in the face of a rocky precipice, may be obtained from the cut introduced at the commencement of the present sheet.

The secluded valley of Petra is now called by the Arabs Wady Moussa, or Valley of Moses, and, with its ruined city, forms one of the greatest wonders of the known world. On all sides are seen traces of a former period of opulence, refinement, and dense population. In a southern direction from Wady Moussa, is the valley of Sabra, which is a smaller Petra. M. Laborde, a late French traveller, thus speaks of it:—"We had scarcely proceeded an hour's distance down the rapid declivity of Wady Sabra, leading our dromedaries after us, when the

supporting walls, ruined buildings, and well-preserved [stone] benches of a theatre, attracted our attention. The ruins of Wady Sabra, as well as those of Wady Pabouchabe, indicate these places to have served as suburbs to the capital—the young swarms sent forth from the parent hive. Had we been enabled to explore the whole of the valleys in the neighbourhood of Wady Mousa, we should, doubtless, have found on all sides similar establishments, which the enormous population of Petra sustained." The prophecies respecting the cities of Mount Seir (Ezekiel, xxxv. 6), are here amply fulfilled. M. Laborde, in his journey along a rocky ridge towards the Red Sea, occasionally met with cultivated spots in this lone wilderness. "The wonderful fertility," he observes, "of these rare patches of earth, in the midst of a sterile country, seemed intended to remind us that one day that region had been happy, before a powerful hand had weighed so heavily upon it. There is to be found at Karek a species of bearded wheat, that justifies the text of the Bible against the charges of exaggeration of which it has been the object; and the vines also of this country, of the fruit of which we saw some specimens, account for the enormous grapes which the spies sent out by Moses brought back from the places they had visited." As the traveller approached the town of Ameimé, about half way between Petra and Akaba, he fell in with another object of art: "We observed with astonishment, as we pursued our way down the mountain, the ancient aqueduct which conveyed the water from the wells of Gana and Gaman to the town of Ameimé, which was built in the plain on the road from Petra or Aila. This aqueduct, extending beyond three leagues [nine miles], follows the level of the surface of the country, above which it never rises. It could only have been by attending most carefully to the undulations of the soil, and by a remarkable proficiency in the scientific operations for taking levels, that the projectors were enabled to succeed in preserving a regular descent for the waters over so great a distance.

The greater part of the remarkable objects of architecture seen at Petra and in this quarter, are obviously of an origin no earlier than the period of the Roman sway over the country, which was at the commencement of the Christian era. These, therefore, are not, in the main, the chief curiosities of the district. The most surprising objects are those remains of art which may have been produced several thousands of years before Christ, when the adjacent land of Egypt on the one side, and Babylonia on the other, were in all their glory. These remains are excavations in the rocks, of a style much more rude than the sculpturings of the Roman and Greek artists, some used for dwellings, and others simply inscriptions. One of the vales proceeding towards Petra in a direction from the Red Sea, is called Wady Mokatteb, or Valley of the Written Mountains, being inscribed with writing in an unknown tongue, in the form of carving, on the face of the precipitous rocks. An account of this remarkable curiosity of art and antiquity, is given by a Franciscan prior, who visited the spot in the course of a journey through the land in 1722. "These mountains," he says, "are called Gebel el Mokatteb, that is to say, the Written Mountains; for as soon as we quitted the mountains of Faran, we passed along others, during a whole hour [a length probably of three miles], which were covered with inscriptions in an unknown character, and carved in these hard rocks of marble, to a height which, in some places, was from ten to twelve feet above the surface of the ground; and although we had amongst us men who understood the Arabian, Greek, Hebrew, Syriac, Coptic, Latin, Armenian, Turkish, English, Illyrian, German, and Bohemian languages, there was not one of us who had the slightest knowledge of the characters engraved in these hard rocks with great labour, in a country where there is nothing to be had either to eat or drink. Hence, it is probable that these characters contain some profound secrets, which, long before the birth of Christ, were sculptured in these rocks by the Chaldeans or some other persons." The publication of this account, upwards of a century ago, excited considerable interest in Europe; and Pococke and Wortley Montague went to Arabia for the purpose of bringing home copies of the inscriptions, and this they accomplished to a certain extent. In 1762, the king of Denmark employed Niebuhr to explore Arabia, but especially to copy the inscriptions on Wady Mokatteb; subsequently other travellers brought copies to Europe, and some were published in the Transactions of the Royal Society in London; but till this day the inscriptions have baffled every attempt to decipher them. The figures composing the inscriptions are partly hieroglyphic, or representations of men and animals with letters, or what appear to be words interspersed. There can be little doubt that they are the oldest writings in the world: their antiquity and signification must be left entirely to the imagination of the reader.

ANCIENT HISTORY OF GREECE AND ROME.

HISTORY OF GREECE.

Ruins of a Grecian Temple.

Greece is a peninsula situated on the northern shore of the Mediterranean, between the Ionian and Ægean seas. It is a beautiful country of hills and valleys, like Wales or the Highlands of Scotland. Some of the hills are so high as to be constantly covered with snow. The vales or low districts enjoy a mild climate, and are of extreme fertility. Some of them, as Tempe and Arcadia, are spoken of with rapture by the poets of ancient times. As the country is much divided by hills and indentations of the sea, it was parted, from an early period, into several states, which were under separate governments, and often made war upon each other. The southern part of the peninsula, anciently styled the Peloponnesus, and now the Morea, was divided into Laconia (containing Sparta), Argolis, Achaia, Arcadia, Elis, and Messenia, each of which was only about the size of a moderate English county. Middle Greece (now Levadia), to the north of the Peloponnesus, and connected with it by the Isthmus of Corinth, on which lay the city of that name, contained Attica (in which was the city of Athens), Megaris, Bœotia (in which was the city of Thebes), Phocis, Locris, Doris, Ætolia, and Acarnania. Northern Greece contained Thessaly (now the district of Jannina), Epirus (now Albania), and Macedonia (now Filiba Vilajeti), the last of which did not, however, belong to Greece till a comparatively late period.

To the east of Greece-proper lay the numerous islands of the Ægean Sea, otherwise denominated the Archipelago; with which may be included certain islands lying in the Mediterranean Sea in the same direction, the principal of which were Rhodes, Cyprus, and the Cyclades. To the south lay Cythera (now Cerigo) and Crete (now Candia). To the west, in the Ionian Sea, lay Corcyra (now Corfu), Cephalonia, Ithaca, and others, now constituting the distinct confederacy of the Ionian Islands, under protection of Great Britain.

Besides having possession of these various districts on the mainland and islands on both sides of the peninsula, the Greeks, in the course of time, acquired colonies on the coast of Asia Minor, adjacent to the islands in the Ægean Sea. The principal of these foreign possessions was Ionia, a beautiful and fertile country, the chief city of which was Ephesus.

In consequence of Greece having been divided into a number of petty states, each of which maintained its own political independence, the history of the country necessarily assumes the character of a number of separate narratives. The Greeks, in the different states, did not consider themselves as constituting a single nation or people, although they were in some measure united by similarity of origin, dialect, religion, and manners. It was not, indeed, till a comparatively late period, that they had any name for the entire country; the name then assumed was Hellas. The term Grecia (Greece) was conferred by the Romans, and has since been generally used.

EARLY HISTORY AND MYTHOLOGY.

The history of the Grecian states commences above 1800 years before Christ, when the Egyptians on the opposite side of the Mediterranean were in a high state of civilization; but the portion of history which precedes 884 B. C. is understood to be fabulous, and entitled to little credit. From their situation in a region whose bays, headlands, and islands, present a great extent of sea-coast, habits of adventure and mutual intercourse were produced among the Greeks in the earliest times these had great influence in cherishing a national activity of character, and making each community eager to rival the prosperity of the others. The people were early accustomed to make voyages, sometimes for traffic, sometimes for war, between the opposite coasts of their gulfs, guiding themselves by the stars from island to island: and a curious proof both of their adventurous spirit, and of the difficulties they encountered in their attempts at navigation, is afforded by the tradition which exists in some old poems concerning one of these isles, called Delos, a huge pile of limestone rock, which was frequently used as a sea-mark in the Ægean: this island is said once to have floated about on the waves, and only to have been fixed in its place at last by Jupiter driving a stake through its centre. In the present age, we can understand by this poetical flight that the Greek canoemen sometimes lost their reckoning, and fell in with the island where they did not expect it.

The accounts given by the poets of this early period of Grecian history, abound in the most ridiculous legends, and these, notwithstanding their absurdity, formed the basis of the mythology or religious belief of the people. A set of imaginary beings, or, perhaps, in some instances, individuals remarkable for warlike genius, or skill in arts, whose names were handed down by tradition, were exalted to the character of gods, and through the medium of beautifully sculptured figures in marble and ivory, were the objects of reverence and worship. Of these various imaginery beings, Jupiter was reckoned the chief; he was believed to possess the sovereignty of heaven and earth. He is always represented as seated upon a throne, with thunderbolts

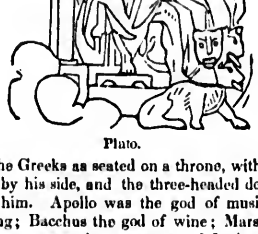
Jupiter.

in his right hand, and an eagle by his side. The wife of Jupiter was Juno, who is described as a beautiful goddess, and is usually depicted as seated in a chariot drawn by two peacocks.

Next in dignity to Jupiter was Neptune, the god of

Neptune.

the ocean, who is painted as a half-naked man, of majestic figure, with a crown on his head, and a trident, or three-pronged fork in his hand. A third principal deity was Pluto, the god of the infernal regions; he was repre-



Pluto.

sented by the Greeks as seated on a throne, with his wife Proserpine by his side, and the three-headed dog Cerberus before him. Apollo was the god of music, poetry and painting; Bacchus the god of wine; Mars the god of war; Mercury was the messenger of Jupiter, and the god of merchandise and thieving; Cupid the god of love; Minerva the goddess of wisdom; Diana the goddess of hunting; Ceres the goddess of grain or of agriculture; Hebe the goddess of youth; Vulcan the fabricator of Jupiter's thunderbolts, and the husband of Venus, the goddess of beauty. There were many other gods and goddesses, held more or less in reverence by the Greeks, and to whom worship was given at altars in the temples. There was also a belief in three vengeful females termed Furies, who were impersonations of Grief, Terror, and Madness; also three females of exceedingly elegant figure, termed the Graces, and whose names were Aglaia, Thalia, and Euphrosyne. The nine Muses, or patronesses of the fine arts, were Thalia, Melpomene, Calliope, Clio, Erato, Euterpe, Polyhymnia, Terpsichore, and Urania. They were supposed to reside upon Parnassus, a lofty mountain in the district of Phocis. Thalia presided over comedy; Melpomene over tragedy; Erato over amatory poetry; Polyhymnia over lyrical poetry; Calliope over heroic or epic poetry and eloquence; Clio over history; Euterpe over music; Terpsichore over dancing, and Urania over the study of astronomy. Besides all these imaginary beings, the mythology comprehended a class of demigods, as Dryads, or wood-nymphs; Satyrs, or rural deities; and Naiads, or water-nymphs.

The gods were supposed to communicate with men, and to reveal the secrets of futurity by means of oracles, several of which existed in various parts of Greece. The most celebrated of the Grecian oracles was that of Apollo at Delphi, a city built on the slope of Mount Parnassus. At a very remote period it had been discovered that from a deep cavern in the side of that mountain an intoxicating vapour issued, the effect of which was so powerful as to throw into convulsions both men and cattle who inhaled it. Of this natural wonder the priesthood readily availed themselves. A temple was reared over the spot, and a priestess, named the Pythoness, was appointed, whose office it was to inhale, at stated intervals, the holy vapour. In performing this dangerous office, the Pythoness was thrown into convulsions, during which she uttered frantic cries, and these being arranged by the attendant priests into sentences, were delivered to the people as the prophecies of the oracle, or god. Lest the oracle should be brought into discredit, care was in general taken by the priest to couch the response to any question put to the Pythoness, in language so obscure and enigmatical, that, whatever course the events should take, the prediction might not be falsified. The Greeks were so superstitious as to put implicit faith in this pretended system of prophecy, and the fame of the oracle of Delphi became so great that no enterprise was undertaken in any part of Greece without a consultation of the Pythoness.

There is probably some shadow of truth in a few of the alleged events of early Grecian history. Theseus, who lived in the thirteenth century before Christ, was said to have laid the foundation of the greatness of the state of Attica, by uniting its twelve cities, and giving them a common constitution. About his time occurred the celebrated *Argonautic Expedition*. This was undertaken by Jason, a prince of Thessaly, in a vessel named *Argo* (hence the name of the expedition); he sailed to Colchis, a place on the east coast of the Euxine or Black Sea, probably with the design of obtaining gold and silver, for which that country was remarkable. Among his companions was a chief named Hercules, a person of uncommon strength, and who afterwards was half deified by the Greeks. The poets say that Phryxus and Helle, the son and daughter of Athamas, king of Thebes, being compelled to quit their native country to avoid the cruelty of their stepmother, mounted on the back of a winged ram with a fleece of gold, and were carried by this wonderful animal through the air towards Colchis, where their uncle, named Æetes, was king. Unfortunately, as they were passing over the strait now called the Dardanelles, which connects the Ægean Sea with the Propontis, or Sea of Marmora, Helle became giddy, and, falling into the water, was drowned. From her, says the fable, the strait was in future named the Hellespont, or sea of Helle. When Phryxus arrived in Colchis, he sacrificed his winged ram to Jupiter, in acknowledgment of divine protection, and deposited its golden fleece in the same deity's temple. He then married the daughter of Æetes, but was afterwards murdered by that king, who wished to obtain possession of the golden fleece. To avenge Phryxus's death, Jason, who was his relation, undertook the expedition to Colchis, where, after performing several marvellous exploits, he not only obtained the golden fleece, but persuaded Medea, another daughter of King Æetes, to become his wife, and to accompany him back to Greece.

Seventy years after the Argonautic expedition, namely, about the year 1194 before Christ, the celebrated Trojan war was commenced. We learn the events connected with this war only through the two heroic poems of the Iliad and Odyssey, which are supposed to have been composed about the year 900 before Christ, by Homer, a blind man who wandered about the country singing his poems for a livelihood. The story is shortly as follows:—Tyndarus, a king of Lacedæmon, had a daughter Helen

of great beauty, whom Theseus, king of Athens, attempted, but without success, to steal from her father. The intelligence of this event rendered Helen famous, and many of the princes of Greece asked her in marriage. Tyndarus, however, allowed his daughter to make choice of a husband, and she pitched upon Menelaus; the successful suitor, on the death of Tyndarus, was raised to the Spartan throne. Shortly after this apparently happy union, Paris, a son of Priam, king of Troy, a small state in Asia Minor, came to reside at the court of Menelaus, and there perfidiously induced Helen to elope with him. Wroth at this baseness, Menelaus summoned various forces to his aid, and set out on a warlike expedition to Troy. Of the chiefs assembled on this occasion, the most celebrated were—Agamemnon, king of Mycenæ; Menelaus, king of Sparta; Ulysses, king of Ithaca, Nestor, king of Pylos; Achilles, son of the king of Thessaly; Ajax, of Salamis; Diomedes, of Ætolia; and Idomeneus, of Crete. The combined forces, on landing in the Trojan territory, commenced a regular siege of the city of Troy. Many skirmishes took place, and there was great slaughter on both sides: the Trojans were led generally in their attacks by the valiant Hector, the eldest son of Priam. At length, after a siege of ten years, Troy was taken, its inhabitants slaughtered, and its edifices burnt to the ground. The Greek princes, however, paid dearly for their triumph by subsequent sufferings, and the disorganization of their kingdoms at home. Ulysses, if we may believe Homer, spent ten years in wandering over seas and lands before arriving in his island of Ithaca; and others of the leaders died, or were shipwrecked, on their way home.

In the course of the eleventh century before Christ, the Greeks began to plant colonies in neighbouring countries. The first colonists, as usually happens in the present day, were dissatisfied citizens, who thought they could form happier communities elsewhere. The Æolians founded twelve cities in Asia Minor, the chief of which was Smyrna. The Dorians sent off colonies to Italy and Sicily, founding, in the former, Tarentum and Locri, and in the latter Agrigetum and Syracuse. In the new settlements, the political system was eminently democratic; and for a long time they enjoyed great prosperity. This prosperity being ascribed at home to their popular institutions, had afterwards the effect of inciting many of the parent states to change their monarchical for a democratic form of government.

SECOND OR AUTHENTIC PERIOD OF HISTORY.

The second and authentic period of Greek history commences in the year 884 B.C., at the institution of the Olympic festival, when the people had begun to emerge from their primitive barbarism. The Olympic festival was instituted by direction of the Delphic oracle, by Iphitus, prince of Elcia or Elis, for the patriotic purpose of assembling together, in a peaceful manner, persons from all parts of Greece. The festival was ordained to take place once every four years, in the month corresponding to our July, and to last five days, during which there was to be complete truce, or cessation from war, throughout the Grecian states. Agreeably to the ancient practice at public solemnities, the festival was celebrated by games and various feats of personal skill, and the whole order of procedure was regulated with extraordinary care. All freemen of Grecian extraction were invited to contend, provided they had been born in lawful wedlock and had lived untainted by any infamous moral stain. No women (the priestesses of Ceres excepted) were permitted to be present. Females who violated this law were thrown from a rock. The competitors prepared themselves during ten months previous at the gymnasium at Elis. During the last thirty days, the exercises were performed with as much regularity as at the games themselves. The festival began in the evening with solemn sacrifices, and the games were commenced the next day at daybreak. These consisted in races on horseback and on foot, in leaping, throwing the discus or quoit, wrestling, and boxing; musical and poetical contests concluded the whole. The honour of having gained a victory in the Olympic games was very great; it extended from the victor to his country, which was proud of owning him. However rude and boisterous were some of the sports of the Olympic festival, it is acknowledged by the best authorities that they were attended with manifold advantages to society. It is sufficient barely to mention the suspension of hostilities, which took place not only during the festival, but a considerable time both before and after it. Considered as a kind of religious ceremony, at which the whole Grecian citizens were invited, and even enjoined, to assist, it was well adapted to facilitate intercourse, to promote knowledge, to soften prejudice, and to hasten the progress of civilization and humanity. The date of the establishment of the Olympic games (884 B. C.) was afterwards assumed by the Greeks as the epoch from which they reckoned the progress of time, the four years intervening between each recurrence of the festival being styled an Olympiad.

At the first institution of the Olympic festival, and for one or two centuries afterwards, the condition of Grecian society was primitive and almost patriarchal, but marked by strong features of heroic dignity, and a certain depth and refinement of thought. The attire of the men was very simple, consisting only of a shirt or close jacket to the body, with a loose robe hanging down over the naked limbs, while performers in the public games were almost naked. The arts, including agriculture, were also little advanced; few persons seemed to have thought of toiling to accumulate wealth; and each community presented, in time of peace, the picture of a large family. That portion of the people constituting the freemen lived much in public, or in the society of their equals, enjoyed common pleasures and amusements, and had daily opportunities of displaying their useful talents in the sight of their fellow-citizens. The frequent disputes between individuals occasioned litigations and trials, which furnished employment for the eloquence and ability of men, in the necessary defence of their friends. The numerous games and public solemnities opened a continual source of entertainment, and habituated every man to active physical exercise and the performance of his duties as a soldier. These were agreeable features in the condition of Grecian society; but there were also some of a contrary kind. The people were of an unsettled disposition, never satisfied long with any kind of government which existed among them, and very much disposed to war against neighbouring states on the most trifling pretences.

The population of the various states was divided into three classes, namely, the citizens, the enfranchised populace, and the slaves. All political power, even in the most democratical of the Grecian communities, was possessed by the first of these classes, while in the oligarchical states only that small portion of the citizens which constituted the nobility or aristocracy, possessed any influence in the management of public affairs. The mechanical and agricultural labours necessary for the support and comfort of the whole, were chiefly performed by the inferior class of free inhabitants, who did not enjoy the privilege of citizenship, and by the slaves, who formed a considerable portion of the population of every state. These slaves were sprung from the same general or parent stock, spoke the same language, and professed the same religion, as their masters. They were, in most cases, the descendants of persons who had been conquered in war, but were in some instances acquired by purchase. Society being thus based on vicious principles, it is not wonderfu

that the Grecian states were the scene of constant civil broils.

Sparta—Lycurgus.

At the beginning of this period of Grecian history, our attention is powerfully attracted by a very remarkable series of proceedings which took place in Lacedæmon, or Laconia, a country in Southern Greece, of which the chief city was Sparta. This city being in a state of intestine disorder, it was agreed by many of the inhabitants to invite Lycurgus, the son of one of their late kings, to undertake the important task of preparing a new constitution for this country. Fortified with the sanction of the Delphic oracle, he commenced this difficult duty, not only settling the form of government but reforming the social institutions and manners of the people. The government he established consisted of two joint kings, with a limited prerogative, and who acted as presidents of a senate of twenty-eight aged men. The functions of the senate were deliberative as well as executive, but no law could be passed without receiving the consent of the assembled citizens. The most remarkable of the arrangements of Lycurgus, was his attempt to abolish difference of rank, and even difference of circumstances, among the people. He resolved on the bold measure of an equal division of lands, and actually parcelled out the Laconian territory into thirty-nine thousand lots, one of which was given to each citizen of Sparta, or free inhabitant of Laconia. Each of these lots was of such a size as barely sufficed to supply the wants of a single family, for Lycurgus was determined that no person should be placed in such circumstances as would permit of luxurious living.

Lycurgus carried into effect a number of other visionary projects: he abolished the use of money, with the hope of preventing undue accumulation of wealth; prohibited foreigners from entering the country, and the natives from going abroad, in order to preserve simplicity of manners among the people; directed that all men, without distinction of rank or age, should eat daily together at public tables, which were furnished with the plainest food; and, finally, ordained that all the children who were born, and seemed likely to be strong, should be reared by public nurses, under a rigid system of privation and personal activity, while the weak infants should be thrown out to the fields to perish. The citizens, when they had attained the age of manhood, were engaged in martial exercises, all labour being left to the slaves, or *helots*, as they were termed; and, in short, the whole nation was but a camp of soldiers, and war was reckoned the only legitimate profession. These laws were in some measure suited to the rude condition of the Spartans, but, as being opposed to some of the best and strongest principles in human nature, they could not possibly endure, and there is reason to believe that some of them were not strictly enforced. It is not unusual to see historians use the term *Spartan virtue* with a certain degree of admiration of its quality, but the Spartans had in reality no moral dignity, certainly no benevolence, in their virtue, either public or private. They were a small confederacy of well-trained soldiers, and, merely as such, deserve no mark of our respect or esteem. The manner in which they used their helots was at once barbarous and cruel. The murder of a serf by a free citizen was not punishable by law; nay it was even allowable for the young Spartans to lie in wait, as a kind of sport, for any good-looking or saucy-looking slave, and stab him to the heart on the highway. It is certain, that at one time, when the helots had stood their masters in good stead in battle, they were desired, by way of reward, to choose out 2000 of their best men, that they might receive their freedom, and be enrolled as Spartans, and that these 2000 men were all silently murdered soon after. At another time, when danger was apprehended from the growing numbers and petty wealth of the boors, the senate enacted the farce of declaring war against them, and coolly murdered many thousands, in order to thin their numbers and break their spirit. Had there been any redeeming trait in the Spartan character to compensate for such barbarity, one would have wondered less at the respect which is sometimes paid them; but their military fame only adds another instance to the many already on record, that the most ignorant and savage tribes make the most dogged soldiers.

Athens.

We now turn to Athens, the capital of Attica, and long the principal seat of Grecian learning and refinement. Athens is said to have been founded by Cecrops, 1550 B. C., and in the most ancient times was called Cecropia. It probably received the name of Athens from the goddess Minerva, who was called also Athena by the Greeks, and to whom an elegant temple had been erected in the city. The old city spread from the mount of the Acropolis over a wide and pleasant vale or low peninsula, formed by the junction of the Cephesus and Ilissus. Its distance from the sea-coast was about five miles. In the course of time, Athens became populous and surpassingly elegant in its architecture, while its citizens contrived to take a lead in the affairs of the communities around. At first they were governed by kings, but, as in the case of the Spartan citizens, they became dissatisfied with their existing constitution, and about the year 600 B. C. invited Solon, one of the wisest men in Greece, to reorganize their political constitution. Solon obeyed the summons, and constituted the government on a broad republican basis, with a council of state forming a judicial court, consisting of 400 members, and called the Areopagus. This court of Areopagus, besides its other duties, exercised a censorship over public morals, and was empowered to punish impiety, profligacy, and even idleness. To this court every citizen was bound to make an annual statement of his income, and the sources from which it was derived. The court was long regarded with very great respect, and the right was accorded to it of not only revising the sentences pronounced by the other criminal tribunals, but even of annulling the judicial decrees of the general assembly of the people. The regulations of Solon were not maintained for any great length of time, although the republican form of government, in one shape or other, continued as long as the country maintained its independence. Clesthenes, the leader of a party, enlarged the democratic principle in the state; he introduced the practice of *ostracism*, by which any person might be banished for ten years without being accused of any crime, if the Athenians apprehended that he had acquired too much influence, or harboured designs against the public liberty. This sentence was called ostracism, because the citizens, in voting for its infliction, wrote the name of the obnoxious individual upon a shell. It is said that Clesthenes was the first victim of his own law, as has chanced in several other remarkable cases.

For a period of about two centuries after the settlement of a republican constitution, there is little of importance to relate in Athenian history. Athens was gradually enlarged, the taste for refinement increased, and various men of sagacious understanding, entitled philosophers, began to devote themselves to inquiries into the nature of the human mind and the character of the Deity. The principal Grecian philosopher who flourished in this era (550 B. C.) was Pythagoras, a man of pure and exalted ideas, and an able expounder of the science of mind.

THIRD PERIOD OF HISTORY.

Persian Invasion.

The year 490 B. C. closes the gradually improving period in Grecian history, or second period, as it has

being armed; and now commenced an era marked by the important event of an invasion from a powerful Asiatic sovereign. Darius, King of Persia, having imagined the possibility of conquering Greece, sent an immense army against it in the year just mentioned. Greatly alarmed at the approach of such an enemy, the Athenians applied to the Spartans for aid; but that people had a superstition which prohibited their taking the field before the moon was at the full, and as, at the time of the application, it still wanted five days of that period, they therefore delayed the march of their troops. Being thus refused all assistance from their neighbours, the Athenians were left to depend entirely on their own courage and resources. A more remarkable instance of a small state endeavouring to oppose the wicked aggression of an overgrown power, has seldom occurred in ancient or modern times; but the constant exercises and training of the Athenian population enabled them to present a bold, and by no means contemptible, front to the invader. War had been their principal employment, and in the field they displayed their noblest qualities. They were unacquainted with those highly disciplined evolutions which give harmony and concert to numerous bodies of men; but what was wanting in skill they supplied by courage. The Athenian, and also other Greek soldiers, marched to the field in a deep phalanx, rushed impetuously to the attack, and bravely closed with their enemies. Each warrior was firmly opposed to his antagonist, and compelled by necessity to the same exertions of valour as if the fortune of the day depended on his single arm. The principal weapon was a spear, which, thrown by the nervous and well-directed vigour of a steady hand, often penetrated the firmest shields and bucklers. When they missed their aim, or when the stroke proved ineffectual through want of force, they drew their swords, and summoning their utmost resolution, darted impetuously on the foe. This mode of war was common to the soldiers and generals, the latter being as much distinguished in battle by their strength and courage as their skill and conduct. The Greeks had bows, slings, and darts, intended for the practice of distant hostility; but their chief dependence was on the spear and sword. Their defensive armour consisted of a bright helmet, adorned with plumes, and covering the

head, a strong corslet defending the breast, greaves of brass descending the leg to the feet, and an ample shield, loosely attached to the left shoulder and arm, which turned in all directions, and opposed its firm resistance to every hostile assault. With men thus organized and accoutred, a battle consisted of so many duels, and the combatants fought with all the keenness of personal resentment; the slaughter in such engagements was correspondingly great, the fight seldom terminating till one party was nearly destroyed, or at least greatly reduced in numbers.

It was a people so animated and prepared that the hosts of Persia were about to encounter. Compelled to meet the invaders unassisted, the Athenians were able to march an army of only 9000 men, exclusive of about as many light-armed slaves, into the field. With Miltiades as their leader and commander-in-chief, they met the Persians in battle on the plain of Marathon, thirty miles from Athens, and by great skill and courage, and the force of their close phalanx of spearmen, completely conquered them. Upwards of 6000 Persians were slain on the field, while the number killed of the Athenians was but 192. This is reckoned by historians one of the most important victories in ancient times, for it saved the independence of the whole of Greece. To the disgrace of the fickle Athenians, they afterwards showed the greatest ingratitude to Miltiades, and put him in prison on a charge of favouring the Persians. He died there, the year after his great victory. Soon after, the citizens of Athens, on a plea equally unfounded, banished Aristides, an able leader of the aristocratic party in the state, and who, from his strict integrity and wisdom, was usually entitled "Aristides the Just." On the banishment of this eminent individual, Themistocles, a person who was more democratic in his sentiments, became the leader of the councils of the Athenians. Meanwhile, the Grecian liberties were again menaced by the Persians. Xerxes, son of Darius, marched an army across the Hellespont by a bridge of boats from the Asiatic shore, and led it towards the southern part of Greece. The utmost force that the confederated Greeks could oppose to the countless host of Persians, did not exceed 60,000 men. Of these, a band of Spartans, numbering 8000 soldiers, under Leonidas their king, was posted at the pass of Thermopylæ, to intercept the enemy, and here they discomfited every successive column of the Persians as it entered the defile. Ultimately, foreseeing certain destruction, Leonidas commanded all to retire but three hundred, with whom he proposed to give the Persians some idea of what the Greeks could submit to for the sake of their country. He and his three hundred were cut off to a man. Xerxes took possession of Attica and Athens, but in the naval battle with the Athenian fleet at Salamis, which occurred soon after (October 20, 480 B.C.), his army was utterly routed, and its scattered remains retreated into Asia.

By this splendid victory, the naval power of Persia was almost annihilated, and the spirit of its monarch so completely humbled, that he durst no longer undertake offensive operations against Greece. Here, therefore, the war ought to have terminated; but so great and valuable had been the spoils obtained by the confederates, that they were unwilling to relinquish the profitable contest. The war, therefore, was continued for twenty years longer, less, apparently, for the chastisement of Persia than for the plunder of her conquered provinces.

But now that all danger was over, many of the smaller states, whose population was scanty, began to grow weary of the contest, and to furnish with reluctance their annual contingent of men to reinforce the allied fleet. It was, in consequence, arranged that those states whose citizens were unwilling to perform personal service, should send merely their proportion of vessels, and pay into the common treasury an annual subsidy, for the maintenance of the sailors with whom the Athenians undertook to man the fleet. The unforeseen but natural consequence of this was the establishment of the complete supremacy of Athens. The annual subsidies gradually assumed the character of a regular tribute, and were compulsorily levied as such; while the recusant communities, deprived of their fleets, which had been given up to the Athenians, were unable to offer effectual resistance to the oppressive exactions of the dominant state. The Athenians were thus raised to an unprecedented pitch of power and opulence, and enabled to adorn their city, to live in dignified idleness, and to enjoy a constant succession of the most costly public amusements, at the expense of the vanquished Persians, and of the scarcely more leniently treated communities of the dependent confederacy.

Pericles.

We have arrived at the most flourishing period of Athenian history, during which Pericles rose to distinction, and greatly contributed to the beautifying of the capital. The talents of Pericles were of the very first order, and they had been carefully cultivated by the ablest tutorage which Greece could afford. After serving for several years in the Athenian army, he ventured to take a part in the business of the popular assembly, and his powerful eloquence soon gained him an ascendency in the national councils; and his power, in fact, became as great as that of an absolute monarch. (445 B. C.) Some of the most interesting events of Grecian history now occurred. After a number of years of general peace, a dispute between the state of Corinth and its dependency, the island of Corcyra (now Corfu), gave rise to a war which again disturbed the repose of all the Grecian states. Corcyra was a colony of Corinth, but having, by its maritime skill and enterprise, raised itself to a higher pitch of opulence than its parent city, it not only refused to acknowledge Corinthian supremacy, but went to war with that state on a question respecting the government of Epidamnus, a colony which the Corcyreans had planted on the coast of Illyria. Corinth applied for and obtained aid from several of the Peloponnesian states to reduce the Corcyræans to subjection; while Corcyra, on the other hand, concluded a defensive alliance with Athens, which sent a fleet to assist the island in vindicating its independence. By way of punishing the Athenians for intermeddling in the quarrel, the Corinthians stirred up a revolt in Potidæa, a town of Chalcidice, near the confines of Macedonia, which had originally been a colony of Corinth, but was at this time a tributary of Athens. The Athenians immediately despatched a fleet and army for the reduction of Potidæa, and the Peloponnesians were equally prompt in sending succours to the city. The Corinthians, meanwhile, were actively engaged in endeavouring to enlist in their cause those states which had not yet taken a decided part in the dispute. To Lacedæmon, in particular, they sent ambassadors to complain of the conduct of the Athenians, which they characterized as a violation of a universally recognised law of Grecian policy, that no state should interfere between another and its dependencies. The efforts of the Corinthians were successful, and almost all the Peloponnesian states, headed by Sparta, together with many of those beyond the isthmus, formed themselves into a confederacy for the purpose of going to war with Athens. Argos and Achaia at first remained neuter. Corcyra, Acarnania, some of the cities of Thessaly, and those of Platæa and Naupactus, were all that took part with the Athenians.

Pericles beheld without dismay the gathering of the storm, but his countrymen were not equally undaunted. They perceived that they were about to be called upon to exchange the idle and luxurious life they were at present leading for one of hardship and danger, and they began to murmur against their political leader for involving them in so alarming a quarrel. They had not at first the courage to impeach Pericles himself, but vented their displeasure against his friends and favourites. Phidias, a very eminent sculptor, whom the great statesman had appointed superintendent of public buildings, was condemned to imprisonment on a frivolous charge; and the philosopher Anaxagoras, the preceptor and friend of Pericles, was charged with disseminating opinions subversive of the national religion, and banished from Athens. Respecting another celebrated individual who at this time fell under persecution, it becomes necessary to say a few words. Aspasia of Miletus was a woman of remarkable beauty and brilliant talents, but she wanted that chastity which is the greatest of feminine graces, and by her dissolute life was rendered a reproach, as she would otherwise have been an ornament, to her sex. This remarkable woman, having come to reside in Athens, attracted the notice of Pericles, who was so much fascinated by her beauty, wit, and eloquence, that, after separating from his wife, with whom he had lived unhappily, he married Aspasia. It was generally believed, that, for the gratification of a private grudge, she had instigated Pericles to quarrel with the Peloponnesian states, and her unpopularity on this score was the true cause of her being now accused, before the assembly of the people, of impiety and grossly immoral practices. Pericles conducted her defence in person, and plead for her with so much earnestness that he was moved even to tears. The people, either finding the accusations to be really unfounded, or unable to resist the eloquence of Pericles, acquitted Aspasia. His enemies next directed their attack against himself. They accused him of embezzling the public money; but he completely rebutted the charge, and proved that he had drawn his income from no other source than his private estate. His frugal and unostentatious style of living must have, of itself, gone far to convince the Athenians of the honesty with which he had administered the public affairs; for while he was filling the city with temples, porticos, and other magnificent works of art, and providing many costly entertainments for the people, his own domestic establishment was regulated with such strict attention to economy, that the members of his family complained of a parsimony which formed a marked contrast to the splendour in which many of the wealthy Athenians then lived.

Confirmed in his authority by this triumphant refutation of the slanders of his enemies, Pericles adopted the wisest measures for the public defence against the invasion which was threatened by the Peloponnesians. Unwilling to risk a battle with the Spartans, who were esteemed not less invincible by land than the Athenians were by sea, he caused the inhabitants of Attica to transport their cattle to Eubœa and the neighbouring islands, and to retire, with as much of their other property as they could take with them, within the walls of Athens. By his provident care the city was stored with provisions sufficient for the support of the multitudes which now crowded it; but greater difficulty was found in furnishing proper accommodation for so vast a population. Many found lodgings in the temples and other public edifices, or in the turrets on the city walls, and great numbers were obliged to construct for themselves temporary abodes in the vacant space within the long walls extending between the city and the port of Piræus.

The memorable contest of twenty-seven years' duration, called "the Peloponnesian war," now commenced (431 B. C.). The Spartan king, Archidamus, entered Attica at the head of a large army of the confederates, and meeting with no opposition, proceeded along its eastern coast, burning the towns and laying waste the country in his course. When the Athenians saw the enemy ravaging the country almost up to their gates, it required all the authority of Pericles to keep them within their fortifications. While the confederates were wasting Attica with fire and sword, the Athenian and Corcyræan fleets were, by the direction of Pericles, avenging the injury, by ravaging the almost defenceless coasts of the Peloponnesus. This, together with a scarcity of provisions, soon induced Archidamus to lead his army homewards. He retired by the western coast of Attica, continuing the work of devastation as he went along.

Early in the summer of the following year, the confederates returned to Attica, which they were again permitted to ravage at their pleasure, as Pericles still adhered to his cautious policy of confining his efforts to the defence of the capital. But an enemy far more terrible than the Peloponnesians attacked the unfortunate Athenians. A pestilence, supposed to have originated in Ethiopia, and which had gradually spread over Egypt and the

western parts of Asia, broke out in the town of Piræus, the inhabitants of which at first supposed their wells to have been poisoned. The disease rapidly advanced into Athens, where it carried off a great number of persons. It is described as having been a species of infectious fever, accompanied with many painful symptoms, and followed, in those who survived the first stages of the disease, by ulcerations of the bowels and limbs. Historians mention, as a proof of the singular virulence of this pestilence, that the birds of prey refused to touch the unburied bodies of its victims, and that all the dogs which fed upon the poisonous relics perished. The mortality was dreadful, and was, of course, greatly increased by the overcrowded state of the city. The prayers of the devout, and the skill of the physicians, were found equally unavailing to stop the progress of the disease, and the miserable Athenians, reduced to despair, believed themselves to be forgotten or hated by their gods. The sick were in many cases left unattended, and the bodies of the dead allowed to lie unburied, while those whom the plague had not yet reached, openly set at defiance all laws, human and divine, and rushed into every excess of criminal indulgence.

Pericles was in the mean time engaged, with a fleet of 150 ships, in wasting with fire and sword the shores of the Peloponnesus. At his return to Athens, finding that the enemy had hastily retired from Attica, through fear of the contagion of the plague, he despatched the fleet to the coast of Chalcidice, to assist the Athenian land forces who were still engaged in the siege of Potidæa—an unfortunate measure, productive of no other result than the communication of the pestilence to the besieging army, by which the majority of the troops were speedily swept away. Maddened by their sufferings, the Athenians now became loud in their murmurs against Pericles, whom they accused of having brought upon them at least a portion of their calamities, by involving them in the Peloponnesian war. An assembly of the people was held, in which Pericles entered upon a justification of his conduct, and exhorted them to courage and perseverance in defence of their independence. The hardships to which they had been exposed by the war, were, he observed, only such as he had in former addresses prepared them to expect; and as for the pestilence, it was a calamity which no human prudence could either have foreseen or averted. He reminded them that they still possessed a fleet which that of no potentate on earth could equal or cope with, and that, after the present evil should have passed away, their navy might yet enable them to acquire universal empire. "What we suffer from the gods," continued he, "we should bear with patience; what from our enemies, with manly firmness; and such were the maxims of our forefathers. From unshaken fortitude in misfortune has arisen the present power of this commonwealth, together with that glory, which, if our empire, according to the lot of all earthly things, decay, shall still survive to all posterity."

The eloquent harangue of Pericles diminished, but did not remove, the alarm and irritation of the Athenians, and they not only dismissed him from all his offices, but imposed upon him a heavy fine. Meanwhile, domestic afflictions were combining with political anxieties and mortifications to oppress the mind of this eminent man, for the members of his family were one by one perishing by the plague. Still, however, he bore himself up, with a fortitude which was witnessed with admiration by all around him; but at the funeral of the last of his children, his firmness at length gave way; and while he was, according to the custom of the country, placing a garland of flowers on the head of the corpse, he burst into loud lamentations, and shed a torrent of tears. It was not long till his mutable countrymen repented of their harshness towards him, and reinvested him with his civil and military authority. He soon after followed his children to the grave, falling, like them, a victim to the prevailing pestilence. (429 B. C.) The concurrent testimony of the ancient writers assigns to Pericles the first place among Grecian statesmen for wisdom and eloquence. Though ambitious of power, he was temperate in its exercise; and it is creditable to his memory, that, in an age and country so little scrupulous in the shedding of blood, his long administration was as merciful and mild as it was vigorous and effective. When constrained to make war, the constant study of this eminent statesman was how to overcome his enemies with the least possible destruction of life, as well on their side as on his own. It is related, that when he was lying at the point of death, and while those who surrounded him were recounting his great actions, he suddenly interrupted them by expressing his surprise that they should bestow so much praise on achievements in which he had been rivalled by many others, while they omitted to mention what was his highest and peculiar honour, namely, *that no act of his had ever caused any Athenian to put on mourning.*

After the death of Pericles, the war was continued without interruption for seven years longer, but with no very decisive advantage to either side. During this period the Athenian councils were chiefly directed by a coarse-minded and unprincipled demagogue, named Cleon, who was at last killed in battle under the walls of Amphipolis, a Macedonian city, of which the possession was disputed by the Athenians and Lacedæmonians. Cleon was succeeded in the direction of public affairs by Nicias, the leader of the aristocratical party, a man of virtuous but unenterprising character, and a military officer of moderate abilities. Under his auspices a peace for fifty years, commonly known by the name of the "peace of Nicias," was concluded in the tenth year of the war (421 B. C.) It was not long, however, till the contest was resumed. Offended that its allies had given up a contest undertaken for the assertion of its alleged rights, Corinth refused to be a party to the treaty of peace, and entered into a new quadruple alliance with Argos, Elis, and Mantinæa, a city of Arcadia; the ostensible object of which confederation was the defence of the Peloponnesian states against the aggressions of Athens and Sparta. This end seemed not difficult of attainment, as fresh distrusts had arisen between the two last-mentioned republics, on account of the reluctance felt and manifested by both to give up certain places which they had bound themselves by treaty mutually to surrender. The jealousies thus excited, were fanned into a violent flame by the artful measures of Alcibiades, a young Athenian, who now began to rise into political power, and whose genius and character subsequently exercised a strong influence upon the affairs of Athens.

Alcibiades.

Alcibiades was the son of Clinias, an Athenian of high rank. Endowed with uncommon beauty of person, and talents of the very highest order, he was, unfortunately, deficient in that unbending integrity, which is an essential element of every character truly great, and his violent passions sometimes impelled him to act in a manner which has brought disgrace on his memory. While still very young, Alcibiades served in the Athenian army, and became the companion and pupil of Socrates, one of the wisest and most virtuous of the Grecian sages. Having rendered some service to his country in a protracted and useless war with Lacedæmon, and being possessed of a talent for addressing the passions of the multitude, Alcibiades, as others had done before him, became the undisputed head of public affairs in Athens. But this pre-eminence was not of long continuance. An opinion arose among the people that he designed to subvert the constitution, and his fall was as quick as his promotion. Many of his friends were put

to death, and he, while absent on an expedition, deprived of his authority. Being thus left without a public director of affairs, Athens, as usual, was torn by internal discords; the aristocratic faction succeeded in overthrowing the democratical government (411 B. C.), and establishing a council of 400 individuals to administer the affairs of the state, with the power of convoking an assembly of 5000 of the principal citizens for advice and assistance in any emergency. These 400 tyrants, as they were popularly called, were no sooner invested with authority, than they annihilated every remaining portion of the free institutions of Athens. They behaved with the greatest insolence and severity towards the people, and endeavoured to confirm and perpetuate their usurped power, by raising a body of mercenary troops in the islands of the Ægean, for the purpose of overawing and enslaving their fellow-citizens. The Athenian army was at this period in the island of Samos, whither it had retired after an expedition against the revolted cities of Asia Minor. When intelligence arrived of the revolution in Athens, and the tyrannical proceedings of the oligarchical faction, the soldiers indignantly refused to obey the new government, and sent an invitation to Alcibiades to return among them, and assist in re-establishing the democratical constitution. He obeyed the call; and as soon as he arrived in Samos, the troops elected him their general. He then sent a message to Athens, commanding the 400 tyrants to divest themselves immediately of their unconstitutional authority, if they wished to avoid deposition and death at his hands.

This message reached Athens at a time of the greatest confusion and alarm. The 400 tyrants had quarrelled among themselves, and were about to appeal to the sword; the island of Eubœa, from which Athens had for some time been principally supplied with provisions, had revolted, and the fleet which had been sent to reduce it had been destroyed by the Lacedæmonians, so that the coasts of Attica, and the port of Athens itself, were now without defence. In these distressing circumstances, the people, roused to desperation, rose upon their oppressors, overturned the government of the 400, after an existence of only a few months, and re-established their ancient institutions. Alcibiades was now recalled; but before revisiting Athens, he was desirous of performing some brilliant military exploit, which might obliterate the recollection of his late connection with the Spartans, and give his return an air of triumph. He accordingly joined the Athenian fleet, then stationed at the entrance of the Hellespont, and soon obtained several important victories over the Lacedæmonians, both by sea and land. He then returned to Athens, where he was received with transports of joy. Chaplets of flowers were showered upon his head, and amidst the most enthusiastic acclamations he proceeded to the place of assembly, where he addressed the people in a speech of such eloquence and power, that, at its conclusion, a crown of gold was placed upon his brows, and he was invested with the supreme command of the Athenian forces, both naval and military. His forfeited property was restored, and the priests were directed to revoke the curses which had formerly been pronounced upon him.

This popularity of Alcibiades was not of long continuance. Many of the dependencies of Athens being in a state of insurrection, he assumed the command of an armament intended for their reduction. But circumstances arose which obliged him to leave the fleet for a short time in charge of one of his officers, named Antiochus, who, in despite of express orders to the contrary, gave battle to the Lacedæmonians during the absence of the commander-in-chief, and was defeated. When intelligence of this action reached Athens, a violent clamour was raised against Alcibiades; he was accused of having neglected his duty, and received a second dismissal from all his offices. On hearing of this, he quitted the fleet, and, retiring to a fortress he had built in the Chersonesus of Thrace, he collected around him a band of military adventurers, with whose assistance he carried on a predatory warfare against the neighbouring Thracian tribes.

Alcibiades did not long survive his second disgrace with his countrymen. Finding his Thracian residence insecure, on account of the increasing power of his Lacedæmonian enemies, he crossed the Hellespont and settled in Bithynia, a country on the Asiatic side of the Propontis. Being there attacked and plundered by the Thracians, he proceeded into Phrygia, and placed himself under the protection of Pharnabasus, the Persian satrap of that province. But even thither the unfortunate chief was followed by the unrelenting hatred of the Lacedæmonians, by whose directions he was privately and foully assassinated. Thus perished, about the fortieth year of his age (403 B. C.), one of the ablest men that Greece ever produced. Distinguished alike as a warrior, an orator, and a statesman, and in his nature noble and generous, Alcibiades would have been truly worthy of our admiration if he had possessed probity; but his want of principle, and his unruly passions, led him to commit many grievous errors, which contributed not a little to produce or aggravate those calamities which latterly overtook him.

DECLINE OF ATHENIAN INDEPENDENCE.

With Alcibiades perished the last of the great men who possessed the power to sway the wild democracy, or, properly speaking, the mob of Athens. From the period of his death till the subjugation of the country, the Athenian people were at the mercy of contending factions, and without a single settled principle of government. During this brief period of their history, in which a kind of popular democracy had attained the command of affairs, happened the trial and condemnation of Socrates, an eminent teacher of morals, and a man guiltless of every offence but that of disgracing, by his illustrious merit, the vices and follies of his contemporaries. On the false charge of corrupting the morals of the people who listened to his admirable expositions, and of denying the religion of his country, he was, to the eternal disgrace of the Athenians, compelled to die by drinking poison, a fate which he submitted to with a magnanimity which has rendered his name for ever celebrated. This odious transaction occurred in the year 400 B. C.

After the death of this great man, the political independence of Athens drew to its termination—a circumstance which cannot excite the least surprise, when we reflect on the turbulence of its citizens, their persecution of virtue and talent, and their unhappy distrust of any settled form of government. Their ruin was finally accomplished by their uncontrollable thirst for war, and can create no emotions of pity or regret in the reader of their distracted history. The Lacedæmonians, under the command of an able officer named Lysander, attacked and totally destroyed the Athenian fleet. By this means having obtained the undisputed command of the sea, Lysander easily reduced those cities on the coasts of Thrace and Asia Minor, and those islands of the Ægean which still acknowledged the supremacy of Athens. Having thus stripped that once lordly state of all its dependencies, he proceeded to blockade the city of Athens itself. The Athenians made a heroic defence; but after a lengthened siege, during which they suffered all the horrors of famine, they were obliged to surrender on such conditions as their enemies thought fit to impose. (404 B. C.) The Spartans demanded that the fortifications of Piræus, and the long walls which connected it with the city, should be demolished; that the Athenians should relinquish all pretensions to authority over their former tributaries, recall the exiled partisans of the 400 tyrants, acknowledge the supremacy of Sparta, and fol-

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low its commanders in time of war; and, finally, that they should adopt such a political constitution as should meet the approbation of the Lacedæmonians. Thus sank the power of Athens, which had so long been the leading state of Greece, and thus terminated the Peloponnesian war, in which the Grecian communities had been so long engaged, to little other purpose than to waste the strength and exhaust the resources of their common country

Condition of Athens.

During the age preceding its fall, Athens, as already mentioned, had been greatly beautified and enlarged by Pericles. At the same time, the comparative simplicity of manners which formerly prevailed, was exchanged for luxurious habits. This alteration has been described by an able historian.* "In the course of a few years, the success of Aristides, Cimon, and Pericles, had tripled the revenues, and increased in a far greater proportion the dominions of the republic. The Athenian galleys commanded the eastern coasts of the Mediterranean; their merchantmen had engrossed the traffic of the adjacent countries; the magazines of Athens abounded with wood, metal, ebony, ivory, and all the materials of the useful as well as of the agreeable arts; they imported the luxuries of Italy, Sicily, Cyprus, Lydia, Pontus, and Peloponnesus; experience had improved their skill of working the silver mines of mount Laurium; they had lately opened the valuable marble veins in mount Pentelicus; the honey of Hymettus became important in domestic use and foreign traffic; the culture of their olives (oil being long their staple commodity, and the only production of Attica which Solon allowed them to export) must have improved with the general improvement of the country in arts and agriculture, especially under the active administration of Pericles, who liberally let loose the public treasure to encourage every species of industry.

"But if that minister promoted the love of action, he found it necessary at least to comply with, if not to excite, the extreme passion for pleasure, which then began to distinguish his countrymen. The people of Athens, successful in every enterprise against their foreign as well as domestic enemies, seemed entitled to reap the fruits of their dangers and victories. For the space of at least twelve years preceding the war of Peloponnesus, their city afforded a perpetual scene of triumph and festivity. Dramatic entertainments, to which they were passionately addicted, were no longer performed in slight condemned edifices, but in stone or marble theatres, erected at great expense, and embellished with the most precious productions of nature and of art. The treasury was opened, not only to supply the decorations of this favourite amusement, but to enable the poorer citizens to enjoy it, without incurring any private expense; and thus, at the cost of the state, or rather of its tributary allies and colonies, to feast and delight their ears and fancy with the combined charms of music and poetry. The pleasure of the eye was peculiarly consulted and gratified in the architecture of theatres and other ornamental buildings; for as Themistocles had strengthened, Pericles adorned, his native city; and unless the concurring testimony of antiquity was illustrated in the Parthenon, or Temple of Minerva, and other existing remains worthy to be immortal, it would be difficult to believe that in the space of a few years there could have been created those numerous yet inestimable wonders of art, those temples, theatres, statues, altars, baths, gymnasia, and porticoes, which, in the language of ancient panegyric, rendered Athens the eye and light of Greece.

"Pericles was blamed for thus decking one favourite city, like a vain voluptuous harlot, at the expense of hundered provinces; but it would have been fortunate for the Athenians if their extorted wealth had not been employed in more perishing, as well as more criminal, luxury. The pomp of religious solemnities, which were twice as numerous and costly in Athens as in any other city of Greece; the extravagance of entertainments and banquets, which on such occasions always followed the sacrifices; the increase of private luxury, which naturally accompanied this public profusion—exhausted the resources, without augmenting the glory, of the republic. Instead of the bread, herbs, and simple fare recommended by the laws of Solon, the Athenians, soon after the eightieth Olympiad, availed themselves of their extensive commerce to import the delicacies of distant countries, which were prepared with all the refinements of cookery. The wines of Cyprus were cooled with snow in summer; in winter, the most delightful flowers adorned the tables and persons of the wealthy Athenians. Nor was it sufficient to be crowned with roses, unless they were likewise anointed with the most precious perfumes. Parasites, dancers, and buffoons, were a usual appendage of every entertainment. Among the weaker sex, the passion for delicate birds, distinguished by their voice or plumage, was carried to such excess as merited the name of madness. The bodies of such youths as were not peculiarly addicted to hunting and horses, which began to be a prevailing taste, were corrupted by a lewd style of living; while their minds were still more polluted by the licentious philosophy of the sophists. It is unnecessary to crowd the picture, since it may be observed, in one word, that the vices and extravagances which are supposed to characterize the declining ages of Greece and Rome, took root in Athens during the administration of Pericles, the most splendid and most prosperous in the Grecian annals."

During this period flourished Æschylus and Sophocles, Euripides and Aristophanes, dramatists; Pindar, a lyrical poet; Herodotus and Thucydides, historians; Xenophanes, Heraclitus, Empedocles, Anaxagoras, and Socrates, philosophers (reasoners upon the nature of the human mind, and upon man's immortal destiny). In this period, also, under the administration of Pericles (from 458 to 429 B. C.), sculpture and architecture attained their perfection. It was then that Phidias executed those splendid works, statues of the gods and goddesses, which excited the admiration of the world, and which succeeding artists have in vain endeavoured to rival. While Athens had extended its power over a great part of the coasts of the Ægean Sea, and increased its trade and commerce by every available means, it had also become a city of palaces and temples, whose ruins continue to be the admiration of ages for their grandeur and beauty. It is understood that the Greeks had acquired their knowledge of architecture from the Egyptians, but they greatly excelled them in the elegance of their designs, and are in a great measure entitled to the character of inventors in the art. The beauty of the Corinthian pillar, for example, has never been excelled either in ancient or modern times. [See ARCHITECTURE.]

After the surrender of Athens to the Spartans (404 B. C.), the democratical constitution was abolished, and the government was intrusted to thirty persons, whose rapacious, oppressive, and bloody administration, ere long procured them the title of the Thirty Tyrants. The ascendency of these intruders was not, however, of long duration. Conon, assisted privately by the Persians, who were desirous of humiliating the Spartans, expelled the enemy, and re-established the independence of his country. Seventy years later, a new source of agitation throughout Greece was caused by the warlike projects of Alexander, king of Macedon, usually styled

Alexander the Great.

This intrepid and ambitious soldier was the son of Philip, king of Macedon, a small territory adjacent to

*History of Ancient Greece, by J. Gillies.

the Grecian states, from which it had originally received a knowledge of arts and learning. Alexander was born in the year 356 B. C., and by his father was committed to the charge of the philosopher Aristotle to be educated, a duty which was faithfully fulfilled. By the assassination of Philip, Alexander was called to the throne of Macedon while yet only twenty years of age, and immediately had an opportunity of displaying his great warlike abilities in conducting an expedition into Greece, which was attended with signal success, and procured for him the honour of succeeding his father as commander-in-chief of the Grecian states. He now carried out a design which had been formed by Philip, to subdue Persia and other countries in Asia. In the spring of 334 B. C., he crossed over to the Asiatic coast, with an army of 30,000 foot and 5000 horse, thus commencing the most important military enterprise which is narrated in the pages of ancient history. Alexander marched through Asia Minor, and in successive encounters completely conquered the armies of Persia; but the whole history of his progress is but an account of splendid victories. During a space of about seven or eight years, he conquered Persia, Assyria, Egypt, Babylonia, and, in fact, became master of nearly all the half-civilized countries in Asia and Africa. It does not appear that Alexander had any motive for this wide-spread overthrow of ancient and remote sovereignties, excepting that of simple ambition, or desire of conquest, with, perhaps, the indefinite idea of improving the social condition of the countries which he overran. From various circumstances in his career, it is apparent that he never contemplated the acquisition of wealth or of praise, except such as could be shared with his soldiers, for whom he displayed a most paternal affection. His character in this respect shines forth in a remarkable speech which he delivered to his army after these great conquests, and when some mutinous murmurs had broken forth in his camp. Mounting the tribunal, he spoke as follows:—"It is not my wish, Macedonians, to change your resolution. Return home, without hindrance from me. But, before leaving the camp, first learn to know your king and yourselves. My father Philip (for with him it is ever fit to begin) found you, at his arrival in Macedon, miserable and hopeless fugitives; covered with skins of sheep; feeding among the mountains some wretched herds which you had neither strength nor courage to defend against the Thracians, Illyrians, and Triballi. Having repelled the ravagers of your country, he brought you from the mountains to the plain, and taught you to confide, not in your fastnesses, but in your valour. By his wisdom and discipline, he trained you to arts and civility, enriched you with mines of gold, instructed you in navigation and commerce, and rendered you a terror to those nations at whose names you used to tremble. Need I mention his conquests in Upper Thrace, or those, still more valuable, in the maritime provinces of that country? Having opened the gates of Greece, he chastised the Phocians, reduced the Thessalians, and, while I shared the command, defeated and humbled the Athenians and Thebans, eternal foes to Macedon, to whom you had been successively tributaries, subjects, and slaves. But my father rendered you their masters; and having entered the Peloponnesus, and regulated at discretion the affairs of that peninsula, he was appointed, by universal consent, general of combined Greece; an appointment not more honourable to himself than glorious for his country. At my accession to the throne, I found a debt of five hundred talents, and scarcely sixty in the treasury. I contracted a fresh debt of eight hundred; and conducting you from Macedon, whose boundaries seemed unworthy to confine you, safely crossed the Hellespont, though the Persians then commanded the sea. By one victory, we gained Ionia, Æolia, both Phrygias, and Lydia. By our courage and activity, the provinces of Cilicia and Syria, the strength of Palestine, the antiquity of Egypt, and the renown of Persia, were added to your empire. Yours, now, are Bactria and Aria, the productions of India, the fertility of Assyria, the wealth of Susa, and the wonders of Babylon. You are generals, princes, satraps. What have I reserved for myself but this purple and diadem, which mark my pre-eminence in toil and danger? Where are my private treasures? Or why should I collect them? Are *my* pleasures expensive? You know that I fare worse than any of yourselves; and have in nothing spared my person. Let him, who dares, compare with me. Let him bare his breast, and I will bare mine. My body, the fore part of my body, is covered with honourable wounds from every sort of weapon. I often watch, that you may repose safely; and to testify my unremitting attention to your happiness, had determined to send home the aged and infirm among you, loaded with wealth and honour. But since you are all desirous to leave me, go! Report to your countrymen, that, unmindful of the signal bounty of your king, you intrusted him to the vanquished barbarians. The report, doubtless, will bespeak your gratitude and piety."

This impassioned and touching oration deeply affected the discontented soldiers, and all gladly returned to their allegiance. Shortly after this, the extraordinary career of Alexander was suddenly cut short by death. At Babylon, while engaged in extensive plans for the future, he became sick, and died in a few days, 323 B. C. Such was the end of this conqueror, in his thirty-second year, after a reign of twelve years and eight months. He left behind him an immense empire, which, possessing no consolidated power, and only loosely united by conquest, became the scene of continual wars. The generals of the Macedonian army respectively seized upon different portions of the empire, each trusting in his sword for an independent establishment. The greedy struggle for power finally terminated in confirming Ptolemy in the possession of Egypt; Seleucus in Upper Asia; Cassander in Macedon and Greece; while several of the provinces in Lower Asia fell to the share of Lysimachus.

CONCLUDING PERIOD OF GREEK HISTORY.

At the death of Alexander, the Athenians considered it a fit opportunity to emancipate themselves from the ascendency of Macedon, but without success. Demosthenes, one of the most eminent patriots and orators of Athens, on this occasion, to avoid being assassinated by order of Antipater, the Macedonian viceroy, killed himself by swallowing poison; and his compatriot Phocion was shortly afterwards put to death by his own countrymen, the Athenians, in a mad outbreak of popular fury. Greece cannot be said to have produced one great man after Phocion; and this deficiency of wise and able leaders was doubtless one chief cause of the insignificance into which the various states, great and small, sank after this epoch.

The ancient history of Greece, as an independent country, now draws to a close. Achaia, hitherto a small unimportant state, having begun to make some pretensions to political consequence, excited the enmity of Sparta, and was compelled to seek the protection of Philip, the ruling prince of Macedon. Philip took the field against the Spartans, and their allies the Ætolians, and was in a fair way of subjecting all Greece by arms and influence, when he ventured on the fatal step of commencing hostilities against the Romans. This measure consummated the ruin of Greece, as well as that of Macedon. The Romans warred with Philip to the end of his life (175 B. C.), and continued the contest with his son Perseus, whom they utterly defeated, and with whom ended the line of the kings of Macedon. In a few years, the once illustrious and free republics

Greece were converted into a Roman province under the name of Achaia (146 B. C.)

Thus terminates the fourth and last period of Greek history, during which there flourished several eminent writers and philosophers, among whom may be numbered Theocritus, a pastoral poet; Xenophon, Polybius, Diodorus Siculus, Dionysius Halicarnassus, Plutarch, and Herodian, historians; Demosthenes, an orator; and Plato, Aristotle, Zeno, and Epicurus, philosophers; also Zeuxis, Timanthes, Pamphilus, Nicias, Apelles, and Eupompus, painters; and Praxiteles, Polycletus, Camachus, Naucides, and Lysippus, sculptors.

In the condition of an humble dependency of Rome, and therefore following the fate of that empire, Greece remained for upwards of four succeeding centuries; but although of little political importance, it still retained its pre-eminence in learning. Enslaved as the land was, it continued to be the great school of the time. As Greece had formerly sent its knowledge and arts over the east by the arms of one of her own kings, she now diffused them over the western world under the protection of Rome. Athens, which was the emporium of Grecian learning and elegance, became the resort of all who were ambitious of excelling either in knowledge or the arts; statesmen went thither to improve themselves in eloquence; philosophers to learn the tenets of the sages of Greece; and artists to study models of excellence in building, statuary, or painting; natives of Greece were also found in all parts of the world, gaining an honourable subsistence by the superior knowledge of their country. That country, in the mean time, was less disturbed by intestine feuds than formerly, but was not exempt from the usual fate of conquests, being subject to the continual extortions of governors and lieutenants, who made the conquered provinces the means of repairing fortunes which had been broken by flattering the caprices of the populace at home.

The period of the independence of Greece, during which all those great deeds were performed which have attracted the attention of the world, may be reckoned from the era of the first Persian war to the conquest of Macedon, the last independent Greek state, by the Romans. This period, as we have seen, embraced little more than three hundred years. It is not, therefore, from the duration of the independent political power of the Grecian states that their celebrity arises. Even the patriotism of their soldiers, and the devoted heroism of Thermopylæ and Marathon, have been emulated elsewhere, without attracting much regard; and we must therefore conclude that it is chiefly from the superiority of its poets, philosophers, historians, and artists, that the importance of the country, in the eyes of modern men, arises. The political squabbles of the Athenians are forgotten; but the moral and intellectual researches of their philosophers, and the elegant remains of their artists, possess an undying fame.

We now turn to the history of the Romans, by whom the Grecian states were finally overpowered.

HISTORY OF ROME.

MONARCHY AND REPUBLIC.

About the time when Lycurgus was settling the institutions of Sparta, Italy was possessed by a set of tribes, some of which, from the traces of their language and arts which have been preserved, appear to have been of eastern origin, being probably colonies from Greece and Asia Minor. The Etrurians, who occupied modern Tuscany, were the most refined of these races. In the country of the Latins, more to the south, in the middle of the eighth century before Christ, a small settlement was formed on a hill near the Tiber, under the conduct, it is said, of a youthful leader named Romulus. A line drawn by the plough, after the fashion of the Etrurians, became the boundary of the town, which at first was composed of only a few huts, occupied by shepherds, freebooters, and other rude people. From Romulus, the name of Roma was conferred on the new city He became the king of the little state, and as such established certain laws and regulations for the general advantage. The lands, which extended several miles around the city, were divided into three portions, one for the support of government, another for the maintenance of religion, and a third for the people themselves, each person having about two acres. He constituted a senate of a hundred (afterwards two hundred) members, who were named *patres* (fathers), and whose descendants, under the name of patricians, or the equestrian order, formed the nobility of Rome. The senate prepared all measures; but these were ultimately deliberated on by the *plebs*, or bulk of the people, not through the medium of representatives, as in modern states, but by a general assembly held in the open air. At first, to increase the numbers of the people, all kinds of malefactors, who could get no settled footing elsewhere, were invited to the new city: it was then found that the male sex preponderated, and the deficiency was supplied by a stratagem, of a nature which marks a very rude state of society. The Sabines, a neighbouring people, were invited to witness the games at Rome; and while these were proceeding, the young men laid hands each on one of the young Sabine women, whom they carried off, and compelled to become their wives. The Sabines were enraged at this act, but the women themselves, when reconciled to their new situation, interposed to prevent bloodshed, and ultimately the transaction had the effect of uniting the Sabines with the Romans, and thus increasing the powers of the infant state. Such is the history usually given of the origin of Rome. A late German writer has shown reason for regarding it as in a great measure fabulous. He considers Romulus as a being little better than imaginary, and the laws and regulations bearing his name as having sprung up in the course of time, and all of them after the period when Romulus is represented as having lived.

The Roman people, from the earliest period of their history, bore a marked resemblance in religion, manners, and general pursuits, to the Greeks, from whom it is obvious that they drew their origin. They believed in the same imaginary deities, such as Jupiter, Neptune, Pluto, Mars, Venus, &c., besides a great number which, in the course of time, they added to this monstrous system of mythology. Like the Greeks, also, they dressed themselves in a simple manner, with a loose mantle, or toga, over a kind of kilt, which left the legs exposed. At the outset, their dependence was almost entirely on agriculture; but for the cultivation of the peaceful arts generally, they seem to have possessed no taste. War and plunder were their favourite pursuits, in which they far exceeded the Greeks, and almost all other nations of ancient or modern times. Their language, founded on the Greek, was that since known as the Latin, a term derived from Latium, the early name of the country in which Rome was situated.

Roman citizen.

During the early period of its history, the Roman government was monarchical, but restricted by a senate and popular assembly, and therefore favourable to social advancement. From Romulus is reckoned a series of seven kings, the ablest of whom, Servius Tullius, placed Rome at the head of the small states forming what has been

called the Latin confederacy, and considerably improved the municipal institutions of the kingdom. The last of the seven kings of Rome was Tarquinius, surnamed the Proud. His son Sextus having committed an atrocious act of violence on Lucretia, the wife of Collatinus, she, unable to survive the dishonour, killed herself. By this transaction, the disgust of the people with their royal family, and with monarchy in general, was brought to a head; and under a noble Roman named Brutus, they rose and expelled Tarquinius, with all his family. Thus ended the regal power in Rome, in the year before Christ 509.

THE REPUBLIC.

The monarchy was succeeded by a republic, in which the chief legislative authority rested with the senate, and the liberties of the people were very little improved. The executive was committed to two magistrates of equal authority, named *consuls*, who were chosen annually. Brutus, who had distinguished himself in expelling the royal family, was chosen one of the two first consuls. During the time he held office, his two sons joined in a conspiracy to restore Tarquin, and Brutus, with a disregard of his own affections, which was considered a great virtue in Greece and Rome when the public interest was concerned, condemned them both to be beheaded in his presence.

The early years of the republic were marked by great struggles between the patrician, or noble order, and the common people. The vigour and perseverance with which the latter sought to emancipate themselves from the authority of the former, compose a striking picture in ancient history, and convey the impression that there were here elements of character superior to what existed at the time in any other nation besides the Greeks. It would be wearisome, however, to detail the various contentions. From the beginning, the plebeians showed a tendency to acquire the mastery. By "the Valerian law," they acquired the right of giving a final judgment on any person condemned by a magistrate. Their importance in composing armies also helped to give them influence. By seizing an opportunity when the patricians were in difficulties from foreign aggression (492 B. C.), they obtained the right of appointing *tribunes* (at first five in number, afterwards ten), who had the power of suspending the decrees of the senate and the sentences of the consul, and had a general charge over the interests of the common people. The power enjoyed by the plebeians at this time is marked by their causing the celebrated Coriolanus to be sent into banishment, his splendid military services being insufficient to atone for his openly espousing the cause of the patricians, and expressing contempt for the people. By the "law of Volero," which gave the people the right of assembling in comitia, and there discussing public affairs, without the decree of the senate—a measure equivalent to parliament assembling with the king's writ—the government of Rome became essentially democratic. (471 B. C.)

As yet the Romans had had no written law. The kings, and after them the consuls, had administered justice each according to his own sense. In the year 451 B. C., at the suggestion of a tribune named Tertullian, ten men (*decemviri*) were appointed to frame and digest a code of laws for the explanation and security of the rights of all orders of the state. The result was the formation of what have been called the *Twelve Tables of the Roman law*, to learn which by heart was a part of liberal education in ancient Rome.

On the appointment of the decemviri, the consuls were discontinued. Each of the ten men acted as supreme magistrate for a day, the nine other officiating as judges. They did not, however, remain long in authority. One of the number, named Appius Claudius, having formed a base design against a maiden named Virginia, daughter of Virginius, a centurion, and affianced to Icilius, caused her to be claimed as his slave, and, as decemviri, gave judgment in his own favour. When Virginius saw his daughter about to be sacrificed to a profligate monster, he seized a knife from a butcher's stall in the Forum, and stabbed her to the heart. The people rose in fury against Appius, who escaped for the time, but at length only avoided punishment by committing suicide. This event caused the abolition of the decemvirate, after it had lasted only three years. The consuls and tribunes were then restored.

The violent struggles of the patricians and plebeians did not prevent Rome from gradually acquiring an ascendency among the Italian states. The armies of Rome, unlike all others in those early times, were standing armies: the soldiers had regular pay, and made arms a profession. Their compact and well-organized force, meeting in general only ill-disciplined militia, carried every thing before it.* Veii, a state which had long defied and rivalled them, fell before their general Camillus. (396 B.C.) In 385 B. C., they finally reduced the Gauls, a powerful branch of the Celtic race inhabiting the north of Italy. They then fought and subdued the Samnites. Other states fell beneath their powerful arms, and in the year 274 B. C., they had acquired the complete mastery of all Italy.

Wars with Carthage.

A splendid victory which they had gained near the close of the Italian wars over Pyrrhus, king of Epirus, who had come to aid the Samnites, led the Romans to believe that they might extend their conquests to countries beyond Italy. Sicily, originally a Greek colony, was at this time important for the great quantities of grain produced in it. The Carthaginians, an enterprising commercial people, occupying a tract of country in the north of Africa, were anxious to obtain possession of this island; but the Romans were inclined to dispute the prize. They fitted out a fleet, the first they ever had, and sent a large force to aid the Sicilians, who were friendly to them, in expelling the Carthaginians. Agrigentum, a great city in Sicily, was taken, after a long siege, by the joint forces of Rome and Syracuse; and the Roman fleet gained a complete victory over that of Carthage. (260 B. C.) These successes were followed by the reduction of Corsica and Sardinia. The Roman fleet then sailed against Carthage itself; the Carthaginians were at first about to submit, but, inspirited by a timely aid from Greece, they made a strong effort to repel the Roman army, in which they were successful, at the same time taking Regulus, the Roman commander, a prisoner. Some time afterwards, when repeated defeats in Sicily made them desirous of peace, they allowed Regulus to go to Rome to help in negotiating it, under a solemn promise to return if the treaty should fail. It was rejected, at the urgent desire of Regulus himself, as discreditable to Rome, and he then deliberately returned to surrender his life to the enraged Carthaginians. After some further successes on the part of the Romans, the Carthaginians submitted to a humiliating

* The Roman army, in its present state, included infantry and cavalry. The heavy-armed infantry, which was its principal strength, was divided into ten cohorts and fifty-five companies, under the orders of a corresponding number of tribunes and centurions. The first cohort, which always claimed the post of honour and the custody of the eagle, was formed of 1105 soldiers, the most approved for valour and fidelity. The remaining nine cohorts consisted each of 555; and the whole body of the legion amounted to 6100 men. Their arms were uniform, and admirably adapted to the nature of their service; an open iron helmet, with a lofty crest; a breast-plate, or coat of mail; greaves on their legs; and an ample buckler on their left arm. Besides a lighter spear, the legionary soldier grasped in his right hand a formidable javelin which he threw at his foe at the distance of ten or twelve paces. As soon as it was darted, he drew his sword, and rushed forwards to close with the enemy. His sword was a short well-tempered blade, that carried a double edge, and was alike suited to the purpose of striking or pushing. It was by this short sword, which was little more than double the length of our modern table-knives, that the Romans conquered the world. The legion was usually drawn up eight deep, and the regular distance of three feet was left between the files, as well as ranks. The legions entrenched themselves in a camp every regular form every night while out on duty, and the remains of these square earthen ramparts are still observable in Britain and most other countries they visited.

peace (241 B. C.), surrendering Sicily, and agreeing to pay a large sum of money. Sicily, excepting the kingdom of Syracuse, now became a province of Rome, being the first out of Italy which she acquired.

Twenty-three years of peace recruited the power of Carthage, and enabled her to renew hostilities with Rome. Under the celebrated Hannibal, a large army proceeded through Spain and Gaul, crossed the Alps, and descended on the plains of Italy. The Romans lost four battles in succession, the last being that of Cannæ, in which 40,000 of their soldiers, and nearly the whole of their knights (or soldiers of the patrician order), are said to have fallen. If Hannibal had instantly marched to Rome, it is believed that he would have gained possession of it, and probably given a new turn to the world's history. He deliberated, and the Romans had time to concentrate all their remaining strength against him. Under their general, Fabius, they pursued a policy which has since become proverbial, avoiding battle, and exhausting the enemy's strength by delay. The war ended (202 B. C.) by their gaining Syracuse, reducing Spain, and taking from Carthage her prisoners, her fleet, and a vast sum of money.

A third war with Carthage, springing expressly from the ambition of the Roman people, began in the year 149 B. C., and ended, three years after, in the complete destruction of that city and people. Carthage was so thoroughly destroyed, that its very site is now matter of uncertainty. In consequence of this success, a large part of northern Africa became tributary to Rome.

Some years before, the Romans had carried their arms into Greece and Asia Minor. Macedonia, whose kings had not long before conquered Persia, India, and Egypt, became tributary to Rome, and Lesser Asia became one of her provinces. The same year in which the Romans destroyed Carthage, saw Greece subjected to them. Thus, in less than a century, they had conquered the greater number of the countries lying around their own comparatively small state.

Insurrection of the Gracchi.

These triumphs were not an unmixed good. The people were intoxicated with success. Vast wealth, arising from spoil, but accumulated chiefly in the hands of the nobility, led to great luxury, and furnished the means of corrupting the people. The overgrown estates and power of the senators produced great discontent, at the same time that it made the citizens venal. At this time (130 B. C.) arose Tiberius and Caius Gracchus, two noble youths, whose zeal to reform the growing corruptions of the state precipitated them at length into measures destructive of all government and social order. Tiberius, the elder brother, urged the people to assert, by force, the revival of an ancient law, limiting property in land, and thus abridging the estates of the patricians. A tumult was the consequence, in which Tiberius and 300 of his friends were killed in the Forum. Caius Gracchus then took up the cause of the people, and, notwithstanding every opposition, was enabled to abridge the power of the senate, to protect the people from monopolists in corn, and extend the rights of Roman citizenship. Employing, like his brother, the dangerous engine of tumultuary force, he fell a victim to it himself, with 3000 of his partisans, who were slaughtered in the streets of Rome. The tumults attending the sedition of the Gracchi were the prelude to those civil disorders which now followed in quick succession to the end of the commonwealth.

It may here be remarked, that Roman liberty, of which we hear so much, rather refers to the resistance which was offered to monarchical and aristocratic rule in the early days of Rome, than to the actual condition of the people as individuals at any period. With much liberty as to public and national matters, there was a great deal of domestic restraint. Slaves, the prisoners taken in battle, or the descendants of such, formed one half of the population of Rome. This portion of the inhabitants had no political rights whatever: their civil rights were so much curtailed, that they could contract no legitimate marriage, were not admitted to give evidence in law, and could not bequeath their property; they might be flogged, and even put to death, at the pleasure of their masters. It was not mere labourers who were in this condition, but clerks, overseers, and persons acquainted with literature. Even among those nominally free, and who had the right of citizenship, all who were not themselves rich were obliged to attach themselves to some nobleman, or *patrician*, as their protector, and were called *his clients*. Without the powerful influence of such a person to enforce his rights, a Roman citizen would have been excommunicated and defenceless. The tie between a patron and his clients in Rome was as close, and as little flattering to the inferior party, as that between a chieftain and his clansman in more recent times. The rich men kept the poorer citizens in pay, and almost in subsistence, for the sake of their votes in the public assemblies; hence this class lost their habits of industry, and, being content to live in miserable dependence on the largesses of the wealthy and ambitious, became idle and dissipated, less respectable even than the slaves. There was a general caressing of the populace by all who expected to be candidates; shows, entertainments, distributions of corn, were continually proposed or offered by one or other, to keep them in good humour; and a particular system of bribery was practised when the elections came to be decided. Hence Cicero calls the people (*plebs urbana*) "the scum and dirt of the town," "the abandoned mob," "lean miserable leeches;" and all this arose from an humble and inconsiderable class of people having votes to sell, which it became the interest of the rich to buy. The slaves, and freedmen, who formed by far the most numerous part of the working people, had of course no votes; and being maintained and cherished only in proportion to their industry and talents, were many of them a confidential and esteemed class among wealthy people in Rome; while the citizens who had hereditary rights were fed and despised.

Sylla—Pompey—Cæsar.

In the proportion in which Rome became a military state, its commanders acquired a dangerous influence in its affairs. Sylla and Marius, two of these commanders, were rivals in the desire of power. The former, while commanding in a war against Mithridates, king of Pontus, was superseded and recalled from Asia. He refused to obey the mandate, and, finding his army disposed to support him, he led it to Rome, expelled Marius and all his partisans, and for a time reigned triumphant. The desolate condition of the exiled Marius, sitting amongst the ruins of Carthage, is often alluded to. After Sylla had returned to pursue the war with Mithridates, his rival, recovering strength, once more acquired an ascendency in Rome, but was suddenly cut off in a fit of debauch. Sylla, now victorious in Asia, returned to Italy, and, being joined by Verres, Cethegus, and the young Pompey, gave battle to the party of his enemies, and entirely defeated them. His entry into Rome was signalized by a dreadful massacre, and a proscription, which had for its object the extermination of every enemy whom he had in Italy. Elected *dictator*, with the unlimited authority attached to that office (one of occasional creation), he acted with a degree of conscientiousness that could scarcely have been expected from one who had shed so much blood. He restored the senate to its judicial authority, regulated the election to all the important offices of the state, and enacted many excellent laws against oppression and the abuse of power. He then voluntarily resigned his dictatorship, and, retiring to the condition of a private citizen, offered publicly to give an account of his conduct. Not long after, he died of the effects of debauchery. Sylla may be reckoned

remarkable example of that union of great vices with noble points of character, which marks a time of semi-civilization. Before the close of Sylla's career, Julius Cæsar, a young man of high birth and great talents, was rising into notice. The chief power in the state was divided between Pompey and Crassus; when Cæsar, by a master-stroke of policy, caused himself to be associated with them in what was called a Triumvirate, or government of three persons. He now subdued Transalpine Gaul (including the present Belgium and France), and, passing over to Britain (54 B.C.), also reduced the people of that country, which the Romans considered as one of the remotest corners of the earth. By the death of Crassus, Cæsar and Pompey were left sole rivals for power. The high military reputation of Cæsar gave him great popular influence, but Pompey was befriended by the consuls and a majority of the senate. A decree was passed, forbidding Cæsar to pass, with his army, the brook Rubicon, which divided Gaul from Italy: he nevertheless did cross the stream and advance to Rome, of which he immediately gained the mastery, Pompey retiring into Greece. Cæsar, marching into Spain, overthrew Pompey's lieutenants there, and at his return found he had been declared dictator. Then, learning that Pompey had raised a large army in Illyria, he marched thither, and, at the decisive battle of Pharsalia, extinguished the hopes of his rival. (49 B.C.) Pompey, who had divided the empire of the civilized world, fled as a dispirited and powerless fugitive to seek the assistance and hospitality of Ptolemy and Cleopatra, in Egypt, but was barbarously murdered the instant he stepped on shore. From the death of Pompey is to be dated the total overthrow of the Roman republic. The corruptions of the state had become too great to admit of any other cure than that of an absolute government. From this period, therefore, the senate and democratic bodies were dispossessed of all power, and Rome was never without a master.

THE EMPIRE.

Condition of the nation.

At the period when the commonwealth passed into the hands of an absolute monarch, the Romans had attained the height of their power. Directing their main energies to military conquest, they had enjoyed some centuries of glory, with every kind of plunder which the conquered countries could produce. Every district in Europe, Asia, and Africa, lying within reach of the Roman legions, had become tributary to Rome. At this period, the nation reckoned about 7,000,000 of citizens, with twice as many provincials, besides as many slaves. From being an obscure town, Rome had become a wide-spread city, and was adorned with majestic temples, public edifices and palaces. Other towns in Italy also rose into importance, and became the residence of distinguished Roman citizens. The public monuments of this remarkable people were placed, not only in the capital, but all over the provinces; and some of them are till this day reckoned among the greatest wonders of art. But the stupendous character of their undertakings was chiefly seen in their roads. All the cities of the empire were connected with each other, and with the capital, by public highways, which, issuing in various directions from the Forum—or great central place of public assembly—of Rome, traversed Italy, pervaded the provinces, and were terminated only by the frontiers of the empire. On the north-west, the boundary of this extensive empire was the wall of Antoninus, built betwixt the Firths of Clyde and Forth, in Scotland, and on the south-east it was the ancient city of Jerusalem. If the distance between these two points be carefully traced, it will be found that the great chain of communication was drawn out to the length of 4080 Roman miles, or 3740 English measure. "The public roads (says Gibbon) were accurately divided by mile-stones, and ran in a direct line from one city to another, with very little respect for the obstacles either of nature or private property. Mountains were perforated, and bold arches thrown over the broadest and most rapid streams. The middle part of the road was raised into a terrace, which commanded the adjacent country, consisted of several strata of sand, gravel, and cement, and was paved with large stones, or, in some places near the capital, with granite. Such was the solid construction of the Roman highways, whose firmness has not entirely yielded to the effort of fifteen centuries. They united the subjects of the most distant provinces by an easy and familiar intercourse; but their primary object had been to facilitate the marches of the legions: nor was any country considered as completely subdued, till it had been rendered, in all its parts, pervious to the arms of the conqueror. The advantage of receiving the earliest intelligence, and of conveying their orders with celerity, induced the emperors to establish, throughout their extensive dominions, the regular institution of posts. Houses were everywhere erected at the distance of only five or six miles; each of them was constantly provided with forty horses, and, by the help of these relays, it was easy to travel 100 miles in a day along the Roman roads." By these means the Romans maintained their ascendency in every country, and diffused through the whole empire the improvements of social life. There was thus a nobleness and grandeur in various circumstances connected with the Roman sway, which by a moderate, firm, and enlightened system of government, might have ultimately proved of the greatest importance in the social advancement of mankind. It was most unfortunate, however, both for this sacred cause and for the welfare of the Roman people themselves, that the plan of enriching the commonwealth at the seat of power, consisted almost exclusively in robbing foreign territories—a plan which it is impossible ever can permanently exist in any country, whatever be its power. Besides, with all the encouragement given to the fine arts, such as architecture, sculpture, and the production of luxuries, there was no substantial industry or commerce, and no means were taken to enlighten and refine the community, by science, literature, or morals. The whole fabric of Roman greatness, in fact, rested on no sure foundation, and its gradual decline and fall, from the extinction of the republic, cannot excite the smallest degree of surprise.

Julius Cæsar.

The successes of Cæsar placed him at the head of the Roman world. His only remaining opponent was Cato, who has been described as one of the most faultless characters in Roman history. This eminent patriot was, however, unable, by force of arms, to restore the liberties of the people, or to arrest Cæsar in his victorious and ambitious career. Being at last deserted by his friends, and dreading to fall into the hands of his enemy, after pondering a while on the nature of the immortality of the soul, he stabbed himself with his own sword—an act which Roman morality held as perfectly justifiable, and which was committed by many of the first characters of the state, when they happened to be deserted by fortune. After the death of Cato, Cæsar was without a rival. Returning to Rome in triumph, he established his power as dictator, and shortly afterwards received the title of *imperator*, or emperor, with full powers of sovereignty. The assumption of these dignities, as may be supposed, served to unite the friends of the republican form of government, or at least all who had thriven on the diseases of the state, with the view of making away with the usurper. A deep-laid conspiracy was accordingly formed against Cæsar, composed of sixty senators, at the head of whom was Decimus Brutus, whose life Cæsar had spared after the battle of Pharsalia, and Cassius, who was pardoned soon after. Cæsar was privately made acquainted with the existence of plots against his life

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but, being of a fearless disposition, he proceeded, on the day intended for the fatal blow, to the senate-house. Here, by a preconcerted signal, he was stabbed behind in the shoulder by Casca. All the conspirators now rushed forward, and he received a second stab in the breast, while Cassius wounded him in the face. In this emergency, he defended himself with great vigour, rushing among them, and throwing down such as opposed him, till he saw Brutus among the conspirators, who, coming up, struck his dagger into his thigh. From that moment, Cæsar thought no more of defending himself, but looking upon the ungrateful assailant, cried out, "And you too, Brutus!" Then, covering his head, and spreading his robe before him, in order to fall with a greater decency, he sank down at the base of Pompey's statue, after receiving twenty-three wounds from hands which he vainly supposed he had disarmed by his benefits. Thus died this remarkable man, the best who ever aspired to sovereignty in Rome, the victor in five hundred battles, and the conqueror of a thousand cities, in the fifty-sixth year of his age, (44 B. C.)

Upon the death of Cæsar, the conspirators were unable to form a government, or to inspire confidence in their designs; and in the distractions which ensued, Mark Antony, an ambitious man and formerly a lieutenant of Cæsar, endeavoured to raise himself to the supreme command. In this effort he was not successful. Octavius grand-nephew and adopted son of Cæsar, also came forward as a candidate for power; and so likewise did a third personage, named Lepidus. As no one of these ambitious men possessed sufficient force to attain supreme command, they entered into a coalition, forming a tripartite power, termed a triumvirate. Being opposed by Brutus, a dreadful civil war ensued, the atrocities of which are scarcely paralleled in history. Brutus was ultimately killed, after which event the triumvirate quarrelled among themselves, and Octavius, by force of arms, becoming conqueror, attained the dignity of emperor of Rome.

Julius Cæsar's successors.

On arriving at this proud eminence, Octavius, now called Augustus Cæsar,* relinquished the ambitious designs of his predecessors; he endeavoured to consolidate the empire, instead of extending it to undue bounds, and introduced a spirit of moderation into the public councils hitherto unknown. Knowing the taste of the Romans, he indulged them in the pride of seeing the appearance of a republic, while he made them really happy in the effects of a most absolute monarchy, guided by the most consummate prudence. Historians delight in recounting the number of good deeds of Augustus, and the glories of his time; and from him the phrase of "the Augustan age," applied by writers to periods in the history of nations remarkable for the prosperity and refinement which prevailed, has been derived. It was in the twenty-fifth year of the reign of this magnanimous prince that Jesus Christ was born, in the Roman province of Judea. In the year 14 of our era, Augustus was succeeded by Tiberius, a person of an entirely different character, and under whom the corruptions of the state became very great. In the nineteenth year of his cruel reign, Christ was crucified, under Pontius Pilate, the Roman governor of Jerusalem. In the year 37, Tiberius was put to death, by smothering him with pillows, or, as some historians allege, by poison; and he was succeeded by Caligula, a person of vicious habits and still more cruel character. This emperor was prodigal and extravagant to a degree almost inconceivable. The luxuries of former emperors were simplicity itself when compared to those which he practised. He contrived new ways of bathing, where the richest oils and most precious perfumes were used with the utmost profusion. He found out dishes of immense value, and had even jewels, we are told, dissolved among his sauces. He sometimes had services of pure gold presented before his guests instead of meat. But his prodigality was the most remarkable in regard to his horse. He built for it a stable of marble, and a manger of ivory. Whenever this animal, which he called Incitatus, was to run, he placed sentinels near its stable the night preceding, to prevent its slumbers from being broken. He appointed it a house, furniture, and a kitchen, in order to treat all its visitors with proper respect. He sometimes invited it to his own table, and presented it with gilt oats, and wine in a golden cup. He often swore by the safety of his horse; and historians mention, that he would have appointed it to a consulship, had not his death prevented. Caligula perished by assassination, after a reign of less than four years; of him it has been said, that nature seemed to have brought him forth, to show what was possible to be produced from the greatest vice, supported by the greatest authority. He was succeeded by Claudius, who was a feeble and contemptible emperor, and who was finally cut off by poison. Nero, the next emperor, was at once noted for his cruelty, his vanity, and his debased passions. The atrocities he committed go beyond the reach of language to describe, and are such as perhaps never entered into the mind of any other human being. A conspiracy having been raised against him, and being at length hunted by assassins, he fell by a stroke of his own dagger. Of the succeeding emperors, we need not here enter into a detail. Under Vespasian, the tenth, and Titus, the eleventh emperor, the state rallied a little, and justice and an appearance of decency were once more resumed.

The reign of Trajan, the fourteenth emperor, almost renewed the glories of Augustus. (A. D. 107.) He advanced the empire to a greater degree of splendour than it had hitherto attained. He pursued his military conquests into new regions, even to Hindostan, and added greatly to the extent of the Roman territories; although this was not ultimately attended with any good effect. Trajan is distinguished as the greatest and the best emperor of Rome. Having given peace and prosperity to the empire, he continued his reign, loved, honoured, and almost adored, by his subjects. A pillar commemorating his great actions, erected in Rome, is still in existence. His successor, Adrian, was also a good sovereign, and was distinguished for his abilities and literary acquirements. After this period, the empire was never again under the authority of any ruler remarkable for his magnanimity. The greater part of the successors of Adrian were dissolute and vicious in their habits, and under them the empire waned to its close. The only one deserving to be noticed was Constantine, the forty-first emperor (A. D. 311.)

Introduction of Christianity.

At the death of Constantius, the fortieth emperor, he bequeathed the sovereignty to his son Constantine, a young prince of promising abilities. In the attempt, however, to take possession of his inheritance, he was opposed by three contending rivals—Maxentius, who governed in Rome, a person of cruel disposition, and a steadfast supporter of paganism; Licinius, who commanded in the east; and Maximin, who also governed some of the eastern provinces. The first step taken by Constantine was an expedition with an army to Rome, to expel Maxentius. One evening, while the army was on its march, Constantine, who was of a meditative disposition, sat in his camp reflecting upon the uncertain fate of sublunary things, and the dangers of the enter-

* A number of the imperial successors of Julius Cæsar assumed the title of *Cæsar*, in addition to their other designations, in the same manner as we find the appellations of Pharaoh and Ptolemy were assumed by many of the Egyptian sovereigns. The name of Cæsar has been curiously enough preserved until modern times, in the title of *Czar*, which is given by the Russians to their monarchs.

prise in which he was engaged. It was then, according to a fabulous legend of the Christian church, that, as the sun was declining, there suddenly appeared a pillar of light in the heavens, in the form of a cross, with the inscription in the Greek language, "In this overcome!" So extraordinary an appearance did not fail to create astonishment and religious awe in the mind of Constantine, and he resolved forthwith to adopt the religious persuasion of the hitherto persecuted Christians. On the day following, he caused a royal standard to be made like that which he had seen in the heavens, and commanded it to be carried before him in his wars, as an ensign of victory and celestial protection. After this, he consulted with several of the principal teachers of Christianity, and made a public avowal of that sacred persuasion. Constantine having thus attached his soldiers to his interest, who were mostly of the Christian faith, lost no time in entering Italy with 90,000 foot, and 800 horse. With this large force, he fought with and overcame Maxentius, and entered Rome in triumph. One of his first acts was to ordain that no criminal should for the future suffer death by crucifixion, which had formerly been the most usual way of punishing slaves convicted of capital offences. Edicts were soon after issued, declaring that the Christians should be eased from all their grievances, and received into places of trust and authority. Thus, the new religion was seen at once to prevail over the Roman empire, and, being associated with the state, the bishops and other clergy were endowed with an authority which had formerly been wielded by the priests of the ancient paganism.

Shortly after the establishment of Christianity (A. D. 321), Constantine executed a resolution of transferring the seat of government from Rome to Byzantium, or Constantinople, as it was afterwards called in honour of his name. As Greece and various provinces in Asia now formed a part of the Roman empire, it was believed that Constantinople would form a more central situation for the capital. Whatever truth there might be in this, the transfer, instead of proving in any respect advantageous, weakened the fabric of the state, and exposed it to a more speedy dissolution. Constantine died when above sixty years old, leaving a mixed character "of piety and credulity, of courage and cruelty, of justice and ambition," and was succeeded by his three sons, Constantine, Constantius, and Constans. These divided the empire among them, but it was subsequently united by Constantius, after a war of twelve years' duration. This union was of no long continuance. Theodosius, in the year 395, permanently divided the empire into the Eastern and Western Roman Empires, the capital of the former being Constantinople, and of the latter Rome. The history of these two divisions of the Roman territory now also separates; and following the usual practice of historians, we leave the Eastern or Byzantine empire to form the subject of a separate narrative, while we conclude with a few words upon the latter days of the old Roman or Western empire.

Destruction of the Roman empire.

For a considerable period, the Roman dominions were pressed upon on nearly all sides by ferocious tribes of barbarians. These were at first unknown to the Romans; but about the era of Constantine they had become formidable, and arose in such numbers, that the earth seemed to produce a new race of mankind, to complete the empire's destruction. Against such an enemy no courage could avail, nor abilities be successful; a victory only cut off numbers without a habitation and a name, soon to be succeeded by others equally desperate and obscure. The emperors who had to contend with this people, were most of them furnished neither with courage nor conduct. Constantius, Julian, Jovian, and Valentinian, successively endeavoured to arrest the tide of barbarism which set in; but they wanted both the personal energy and the stern soldiery of the early commonwealth to accomplish this desirable object. In the vain attempt to stop an immense inundation of Huns, Allanes, and Goths, from the extensive deserts of Tartary and Russia, the Roman armies were greatly weakened; so that the emperors, finding it difficult at last to raise levies in the provinces, were obliged to hire one body of barbarians to oppose another. This expedient had its use in circumstances of immediate danger; but when that was over, the Romans found it was as difficult to rid themselves of their new allies as of their former enemies. Thus, the empire was not ruined by any particular invasion, but sank gradually under the weight of several attacks made upon it on every side. When the barbarians had wasted one province, those who succeeded the first spoilers proceeded on to another. Their devastations were at first limited to Thrace, Mysia, and Pannonia; but when these countries were ruined, they destroyed Macedonia, Thessaly, and Greece, and thence they proceeded to Noricum. The empire was in this manner continually shrinking, and Italy at last became the frontier of its own dominion.

The valour and conduct of Theodosius in some measure retarded the progress of destruction; but, upon his death, the enemy became irresistible. A large body of Goths had been called in to assist the regular forces, under Alaric, their king; but what was brought in to stop the universal decline, proved the last mortal stab to the empire. This Gothic prince, from an ally became a dangerous foe; and finally marching to Rome, made himself master of the city, which he abandoned to be pillaged by his soldiers. (A. D. 410.)

After this disastrous event, Rome was plundered several times, and Italy was overrun by barbarous invaders, under various denominations, from the remotest skirts of Europe. The inhabitants of Rome, who had sunk into the grossest vices by the overpowering influence of wealth and prosperity, were quite unable to make any defence. So debased had they become, or so ill regulated was the balance of wealth, that for many years the whole of the lower classes had been fed daily by the emperors from the public granaries. The power of the state was now entirely broken; the provinces were voluntarily abandoned, or they rebelled, or were seized by the nearest barbarous powers. At length the title of emperor of the west, which, on one occasion, was put up to public auction by the licentious soldiery, expired; and, to finish the melancholy account, one of the princes of the barbarians assumed the title of *king of all Italy*. "Such" (to quote the words of Goldsmith) "was the end of this great empire, that had conquered mankind with its arms, and instructed the world with its wisdom; that had risen by temperance, and that fell by luxury; that had been established by a spirit of patriotism, and that sank into ruin when the empire was become so extensive, that a Roman citizen was but an empty name." Its final dissolution took place in the 480th year of the Christian era, or 1232 years from the date of the foundation of Rome.

ROMAN LITERATURE.

Literature could scarcely be said to exist among the Romans till their conquests in Greece made them acquainted with the admirable productions of that country, and the custom arose of sending youths to be educated in Athens. In the second century before the Christian era, comic dramatic writing was cultivated by *Ennius* and *Plautus*, and after them by *Terentius*, a slave, whose first comedy, the Andria, was acted in the year 165 B.C. Of Roman tragic writing, no remains have come down to our times. The *elder Cato*, who flourished in the same century, is praised as a writer by those who came after him; but we have scarcely any remains of his com

positions. Philosophical writing may be said to have arisen and at once reached its acme in *Cicero*, the celebrated orator (born 106, died 46 B. C.), beyond all question the greatest man in the department of letters to whom the Roman state gave birth. Besides many strictly philosophical treatises, he has left several works on rhetoric, and many orations and epistles.

A philosophical manner of relating events took its rise with *Sallustius* (born 68 B. C.), whose histories of the Jugurthan war and of the conspiracy of Catiline, though perhaps not free from prejudice, are considered as models of composition. The Commentaries of Cæsar, in which, with noble simplicity, he relates the history of his own campaigns, place him among the first Roman writers. *Livius*, who lived in the reign of Augustus, stands unrivalled among the Roman historical writers, being distinguished by consummate judgment in the selection of facts, perspicuity of arrangement, sagacious reflection, sound views of policy, and the most copious, pure, and eloquent expression. Of his history of Rome, written in 142 books, only 35 have reached us. Next to him, in the same department, is *Tacitus* (born A. D. 55), whose Annals of Rome, extending throughout the greater part of the first century, and his life of Agricola, the conqueror of Britain, are remarkable for acuteness of thought and concise style.

Lucretius, a dramatic, and *Catullus*, a lyric poet, were the principal writers of that kind who rose before the reign of Augustus. This reign was not only adorned by Livius, but by a cluster of poets, of unmatched excellence. *Virgilius*, a native of Mantua, wrote Bucolics, or pastoral dialogues, Georgics, or poetical treatises on agricultural subjects, and the Æneid, a heroic or epic poem. His style is remarkable for smoothness, and a fine strain of feeling. *Horatius*, his contemporary and friend, composed odes, satires, and epistles: he has never been excelled in felicity of phrase and epigrammatic point; the general strain of his writings is gay and familiar. *Ovidius* was a most elegant, though licentious poet. *Tibullus*, *Propertius*, and *Martial*, complete the list of the principal Roman poetical writers. *Lucanus*, *Statius*, and *Silius Italicus*, flourished in a later time, when luxuriance of ornament and a tendency to conceit showed that the best days of the national intellect were past.

Plinius (born A. D. 23) was almost the only Roman writer who treated of nature or science; he was an associate of Tacitus, and has left behind him works not less celebrated. He was a diligent student of the operations of nature, both animate and inanimate, and having devoted every spare moment to the noting down of facts and observations, he finally produced a voluminous work on Natural History, in thirty-seven books, which is reckoned the more valuable for its containing extracts from many lost works. Pliny was unfortunately killed in the year 79, by an eruption from Vesuvius which destroyed the city of Herculaneum, where he was at the time residing.

The Romans distinguished themselves in philosophy only by spreading the doctrines of the Greek philosophers in a language more extensively understood. The principal writer on morals was *Seneca*, born in the first year of the Christian era. Gifted by nature with excellent talents, he devoted himself to the cultivation of the Stoic philosophy, and his various learning and practical wisdom procured him the office of tutor to Nero. He afterwards incurred the enmity of that monster of cruelty, and was condemned by him to death. He died with the calmness of a virtuous mind (A. D. 66).

It is perhaps unnecessary to mention, that none of the works of the writers whose names have been quoted, nor of others of less importance, were circulated generally among the Roman people. Being written on rolls of parchment or papyrus, copies were multiplied only by great labour and expense, and sold or exhibited exclusively to persons of taste and opulence. Thus, the great mass of Roman citizens and provincials were left in entire ignorance of books, or of the subjects of which they treated. In the Roman city of Pompeii, lately uncovered from the effects of a dreadful eruption of Vesuvius, many interesting remains of art have been discovered, but no traces of literature whatsoever. Being excluded from the pleasures and advantages of mental culture through the agency of books, the only recreations of the people consisted in boisterous games, witnessing fights of gladiators or swordsmen with each other, or with wild beasts, or attending spectacles probably less barbarous, but not more calculated to cultivate the national intellect, or produce social refinement. In these facts, we find the true cause of the decline of both Greek and Roman civilization. It was a civilization only of castes and classes. There was nothing expansive or vivifying in it. Suddenly it sprang up in the Grecian republics, and was transplanted to Rome; but there, after a short struggle, it was rooted out and destroyed. The modern civilization that arose out of the chaos that followed the demise of the Roman power, is an entirely different thing, because it less or more pervades all classes of society, and by means of the expansive principle of education, aided by the art of printing, promises to extend and increase in vigour throughout every succeeding generation, till it ultimately fulfil the highest conditions of improvement of which the human race is susceptible.

Of the events which ensued on the destruction of the Roman empire, an account is given in the HISTORY OF THE MIDDLE AGES.

HISTORY OF THE MIDDLE AGES.

We comprehend under the title of the Dark or Middle Ages, that period which immediately succeeded the destruction of the Roman western empire, and extended to the end of the fifteenth or the commencement of the sixteenth century. Though named *dark*, those ages comprise a long and very remarkable period in the history of the human race, and exhibit many wonderful phenomena of human nature. It was during this period that all the great foundations on which modern society still rests were first laid, and those great thoughts, discoveries, and inventions, took their rise, which have chiefly distinguished modern from ancient times.

EASTERN EMPIRE TO THE END OF THE ELEVENTH CENTURY.

In another article (ANCIENT HISTORY OF GREECE AND ROME), the decline of the Roman empire has been traced till the period (321) when Constantine transferred the imperial abode to Byzantium (a city situated on the west shore of the Black Sea, and afterwards called Constantinople, in honour of its second founder). In his endeavours to make this city the seat of government, he only partially succeeded; for it generally happened after his day that there was one emperor in the east and another in the west, and not unfrequently two or three different individuals in the provinces, at the head of considerable military forces, claiming partial and even universal empire. Rome itself and the countries of western Europe were soon to lose the characteristics and individuality of empire, but Constantinople continued for a thousand years the abode of men who had still the name of emperors, and reckoned themselves the descendants of the Cæsars, although they had long ceased to wield any thing but the shadow of power. Constantine was himself instrumental in dismembering his empire, having before his death divided it among no fewer than five individuals, namely, his three sons, Constantine, Constans, and Constantius, and two nephews named Dalmatius and Annibalianus, both of whom bore in addition the surname of Cæsar, still popular among a people who wished themselves to be considered Roman.

Constantine II. soon fell a sacrifice to the cruelty and ambition of his brother Constans, who, in his turn, lost his life in attempting to quell a revolt among his subjects; and Constantius, the youngest of the sons, having found means to destroy the two Cæsars, and five other cousins, and two uncles, found himself, at an early period of life, the undisputed master of the empire. He reigned twenty-four years, but left no monuments of goodness or of greatness, having wasted his time in the practice of vice, or in the equally unprofitable, if more innocent, employment of disputing with bishops on the abstrusest points of doctrinal theology, while a host of enemies, apparently from every side of his dominions, were engaged in undermining and laying waste the empire. It was in the west that these attacks were first made, though, perhaps, it was in the east that they were fiercest. Numberless and powerful barbarians now began to pour unceasingly upon Gaul, Spain, and latterly upon Italy itself, from the forests of the north, and in particular from those of Germany—a country whose inhabitants have been remarkable in the history of the world, both as having originated many of the greatest movements in society, and as having laid open more of the sources of human thought than any other people that could be named. The Franks, Saxons, Goths, and Alemanni, devastated the fine countries watered by the Rhine, and so effectually parted them from the empire, that from this period their history becomes wholly separate. At the same time the Sarmatians, Persians, Scythians, and others, made dreadful incursions on the east. All that Constantius did to stem this powerful tide, was to raise his kinsman Julian, whom he surnamed Cæsar, to command in the army.

Julian had been early instructed in the Christian religion, but he is not known to have ever given it any credit, although he has been often called apostate. He had imbibed the philosophy of Plato in the schools of Athens; and with this learning, with the elements of a great character in his mind, and with the models of Cæsar, of Trajan, and of Marcus Antoninus in his eye, he formed the design, and seemed to have the ability, to raise up and consolidate the glories of the falling empire. His victories over the Alemanni in Gaul, although they preserved the empire, excited only the envy of the emperor, and Constantius was about to depose him from his command, when his own death saved him from the ignominy to which the soldiery would certainly have subjected him for any attempt to degrade their favourite commander. Julian was himself declared emperor by the army, and the people had lost both the power and the will to resist. Unfortunately for his fame, Julian perished in battle with the Persians, only three years after his accession. In that short period he had reformed many abuses in the state; and though personally hostile to the Christian religion, and though he used both arguments and ridicule against it, he not only advocated, but practised, universal toleration. It is creditable, also, to Julian, that in establishing the ancient orders of Roman priesthood, he was at pains to enforce a strict morality in all the relations of life. He was succeeded, after the fall of several candidates, by Valentinian, whose father had been a soldier from the Danube. This emperor took for colleague his brother Valens, to whom he assigned Constantinople and the government of the East. The reign of Valens was signalized by the irruption into Europe of an enemy till then unknown to the Romans; these were the *Huns*, a confederation of Tartar tribes, some of whom had attained the ascendency and control over the rest, and led them on to invade the nations of Europe. Their numbers and ferocity led the ancient writers to describe them in terms of consternation, which to moderns, who are no strangers to Calmucs, Cossacks, Tartars, and other savages of similar origin, appear sufficiently ludicrous,

They never lived in houses, slept under trees, ate raw flesh, and were altogether superior in war even to the Goths, who were now in alliance with the Romans, and had begun to relish the comforts of a settled life. They were, therefore, driven away before the Huns, and were forced, in search of a home, to invade the Roman territory. Here they were opposed by the Emperor Valens, but they defeated his army, and made his own life a sacrifice. He was succeeded by his nephew Gratian, who chose for his colleague Theodosius, a general of talents and celebrity. This emperor restored the confidence of his own army, and broke the power of the Goths, by his skill and caution; and was the first of the emperors who practised the mode of dividing the barbarians against one another, by giving money to such of their tribes as he imagined would make useful auxiliaries. This system, which the wealth of the emperors (from their possession of all the maritime and trading cities) enabled them long to use against their poorer enemies, often saved the empire at the expense of its dignity; for though the money was given at first as a gratuity, it was sometimes demanded in times of weakness as a tribute. This Theodosius (commonly called the Great) was the first who made Christianity the established religion of the empire (390). He procured a senatorial edict in favour of the Christians, sanctioned the destruction of the heathen temples, and forbade the performance of sacrifices, either in public or private. The empire under this prince still preserved its original extent; but he divided it between his two sons, Arcadius and Honorius (394), and its parts were never afterwards reunited.

From the death of Theodosius II. (449) to the reign of Justinian (527), the eastern empire continued without any considerable alteration, though there were many changes and intrigues in the court and army. The reign of the latter prince is memorable on several accounts: it was under his auspices that a knowledge of the silk manufacture was first brought to Europe, where it gave employment to much ingenious industry (800). Justinian also caused certain eminent lawyers to prepare a code of laws, and an abridgment of law decisions, &c., called the Pandects, which were used by all his successors, and have been adopted as the basis of their laws by several countries of Europe. With the single exception of the *Code de Napoleon*, these form the only complete and perfect abstract of national law which any government has given to its people. Whatever may have been Justinian's errors, his having projected this work, and procured so many able ministers to execute it, must redound for ever to his honour. The talents and virtues of his general, Belisarius, regained to the empire Africa and great part of Italy, from the Vandals and Ostrogoths; this conquest, however, only prevented the latter region from being united under one government, and has been the cause of its remaining a feeble and divided country ever since. In the reign of Tiberius, shortly after (580), the people of Rome, though they entreated with great earnestness the aid and pity of the emperor, who now claimed to rule over them, were unable to obtain any relief, and remained distracted between their attachment to the ancient head of the empire, and the claims of his enemies who occupied the rest of Italy.

The next emperor who merits attention is Heraclius (610), a native of Africa. The eastern empire had till now preserved its ancient boundaries in their full extent, and was mistress of Carthage, Egypt, Syria, and Asia Minor, besides Greece, and the countries on the Danube. The Roman armies on the eastern frontier had, however, been lately driven in by Chosroes, King of Persia, who now occupied all the north of Africa and Syria. This was the first great violation of their territory sustained by the emperors of Constantinople; and Heraclius avenged it with a celerity and effect which made the Persians tremble. His triumph, however, was short, for the latter part of his reign was disturbed by the rise and victories of Mohammed. The successors of this signal impostor, after breaking the power of Persia (already weakened by the victories of Heraclius), immediately attacked the Roman empire; then defeated its armies in two battles, occupied all Syria, and obliged the emperor (now an old man) to retire to Constantinople. He died in 641.

The continued victories of the followers of Mohammed (called Arabs or Saracens) soon deprived the empire of Egypt, Africa, and Syria; and in 668 they followed up their success by attacking Constantinople itself. The city sustained two sieges, in the first of which the Saracens were encamped in its neighbourhood, and carried on the operations of a siege at intervals, for seven years; and in the second for nearly two. In both, the Saracens wasted immense resources ineffectually.

The empire had now lost all its provinces eastward of Mount Taurus, and the cities of Alexandria, Jerusalem, and Antioch, were in the hands of the Mohammedans. There was little further change in its condition till the year 867, under the Emperor Basil, who gave new vigour both to the internal administration and to the military resources of the government. This prince, and his immediate predecessor Zimisces, made the Roman arms—for they still wished to be called Romans—respected on the Euphrates and Tigris, and asserted the ancient warlike reputation and boundaries of the empire. They were now, however, deprived of the resources they had enjoyed in the secure possession of the great commercial cities of the Mediterranean—Alexandria, Carthage, Cæsarea, &c.; and the trade and revenues of those which remained were crippled and diminished, from the want of that free general intercourse which had existed when they were all under one government. Hence the armies were maintained with greater difficulty, and any victories that were gained could not be followed up with effect. The early enemies of the empire—the Goths, Vandals, and Huns—had now settled into civilized communities, and were no longer formidable. The foes with whom it contended latterly were the Bulgarians and Seljukian Turks; the former of whom were rather troublesome than dangerous, but the latter, who had succeeded the Saracens in the dominion of Asia, aimed at nothing short of the destruction of the Roman name. They succeeded at last, by defeating and taking prisoner the Emperor Romanus Diogenes, in tearing away almost the whole province of Asia Minor (1099); and the emperors were now confined to their dominions in Europe, which, however, still formed a monarchy not much smaller than France or Spain.

The manners of the court of Constantinople, during much of this period, were dissolute and corrupt. We are told of one emperor who ordered a plate of human noses to be brought to his table; another was accustomed to seize the deputies of cities whose tribute was in arrear, and suspend them with their heads downwards over a slow fire; a third got up farces in mockery of the ceremonials of religion: and, in general, the appointment of officers, and even the succession to the empire (where it was not seized by some successful general), was in the hands of the women and eunuchs of the palace. The cities and provinces generally acquiesced, as to the choice of an emperor, in the decision of the capital or army; this circumstance shows that the laws were attended to, and that there was a regular system of government, which was not much disturbed by the personal character of the reigning prince. The countries of Greece, however, which had formerly been the seat of knowledge and the arts, were now sunk in ignorance; and the little learning that was cultivated in Athens was only scholastic divinity, or the pedantry of law and grammar. There is no scholar or philosopher of the empire of Constantinople who is generally known to posterity.

A great change took place in the relations of the empire after the eleventh century. It was still pressed by the Turks on the east, who now occupied Asia Minor, and were only separated from Constantinople by the Hellespont; while, in Europe, its territories were disturbed by the incursions of certain Norman adventurers who had settled in Sicily. Against these enemies the Emperor Claudius Comnenus, an active prince, and full of resources, made all the resistance which his diminished revenues allowed. He applied to the Christian sovereigns of Europe to aid him in expelling the Mohammedans from the territories of the empire, but, above all, to drive out the Turks from the land of Judea, which they occupied and profaned, and where they harassed the Christian pilgrims who desired to visit the scenes of Scripture history. His appeal was received in Europe at a time when many concurring causes had brought the mass of the people to a state of uneasiness which at once foreboded and rendered necessary some extensive change in their condition. Countrymen of their own, pilgrims from the shrine of the tomb of Christ, had returned and filled them with horror by a recital of indignities which Turkish infidels were casting on those scenes and subjects with which their own most sacred feelings were associated; and the result was that extraordinary outpouring of the inhabitants of Europe upon Asia, which has been termed the Crusades, and to which we shall afterwards advert.

ARABIA.—MOHAMMED.—EMPIRE OF THE SARACENS.

It was not before the sixth century that Arabia became peculiarly remarkable in the history of the world. The wild Arabs, as they have been generally called, had already signalized themselves by incursions on the empire of the east, when Mohammed was born, in the year 569 (some say, 571) of the Christian era, at Mecca, the principal city of their country. He is said to have been descended from some great families; but it is certain that his immediate progenitors were poor, and he had little education but what his own means and his own mind could give him. Yet this man became the founder of a great empire, and the fabricator of a religion which has continued to our own day to affect greater numbers of mankind than Christianity itself. At an early period of life, we are told, "he retired to the desert, and pretended to hold conferences with the Angel Gabriel, who delivered to him, from time to time, portions of a sacred book or Koran, containing revelations of the will of the Supreme Being, and of the doctrines which he required his prophet (that is, Mohammed himself) to communicate to the world." The Mohammedan religion, as the so-called revelations of this great impostor have since been designated, was a strange mixture of the superstitions of Arabia, the morality of Christ, and the rites of Judaism. It was to this happy mixture of tenets, usages, and traditions already existing among his countrymen, and to the applicability of the precepts of the Koran to all legal transactions and all the business of life, that Mohammed seems to have owed his extraordinary success. Others, indeed, have attributed this to certain indulgences allowed in the Koran; but in reality these indulgences existed before, and the book breathes upon the whole an austere spirit. This extraordinary work inculcated elevated notions of the divine nature and of moral duties; it taught that God's will and power were constantly exerted towards the happiness of his creatures, and that the duty of man was to love his neighbours, assist the poor, protect the injured, to be humane to inferior animals, and to pray seven times a-day. It taught that, to revive the impression of those laws which God had engraven originally in the hearts of men, He had sent his prophets upon earth—Abraham, Moses, Jesus Christ, and Mohammed—the last, the greatest, to whom all the world should owe its conversion to the true religion. By producing the Koran in detached parcels, Mohammed had it in his power to solve all objections by new revelations. It was only after he was well advanced in years that his doctrines began to be received. At first, indeed, they were so violently opposed by his fellow-citizens of Mecca, that the prophet was obliged to fly from the city to save his life. This event is called by his followers *Hegyra*, or the Flight; it occurred in the 622d year of the Christian era; and they reckon dates from it as we do from the birth of Christ. Mohammed took refuge in the city of Medina, and by the aid of his disciples there, he was soon enabled to return to Mecca at the head of an armed force. This enabled him to subdue those who would not be convinced, and henceforward he proceeded to make proselytes and subjects together, till at length, being master of all Arabia and of Syria, his numerous followers saluted him king. (627.) This extraordinary man died suddenly and in the midst of successes, at the age of sixty-one (632). Abubeker, his father-in-law and successor, united and published the books of the Koran, and continued and extended the empire, spiritual and temporal, which Mohammed had left him.

A more powerful caliph (such was the title given to this series of monarchs) was Omar, the successor of Abubeker (635). Barbarity, ferocity, and superstition seem to have been mingled and to have reached their height in the person of Omar. It was by his order that the most magnificent library of antiquity, that of Alexandria, consisting of 700,000 volumes, was burned to ashes. The reason which he gave for this act is worth preserving: "If these writings," he said, "agree with the Koran, they are useless, and need not be preserved; if they disagree, they are pernicious, and ought to be destroyed." By himself and his generals, this ferocious conqueror added Syria, Phœnicia, Mesopotamia, Chaldea, Egypt, Lybia, and Numidia, to his empire. Next came Otman, and then Ali, the son-in-law of Mohammed himself. The name of Ali is still revered by Mussulmans. His reign was short but glorious. "After some internal troubles, the Saracens won their way along the coast of Africa, as far as the pillars of Hercules, and a third province was irretrievably torn from the Greek empire. These western conquests introduced them to fresh enemies, and ushered in more splendid successes. Encouraged by the disunion of the Visigoths [in Spain], and invited by treachery, Muza, the general of a master who sat beyond the opposite extremity of the Mediterranean Sea, passed over into Spain, and within about two years the name of Mohammed was invoked under the Pyreneans."—(*Hallam*, 710.)

Nineteen caliphs of the race of Omar succeeded Ali, and after these came the dynasty of the Abassyds, descended by the male line from Mohammed. The second caliph of this race, named Almanzor, removed the seat of empire to Bagdat (762), and introduced learning and the culture of the sciences, which his successors continued to promote with zeal and liberality. This was some recompense for those indignities which had been cast upon literature by the brutal Omar. Perhaps the obligations of modern Europe to Arabia at this time have been overstated; but it is not to be denied that learning, almost totally excluded and extinct in Europe during the eighth and ninth centuries, found an asylum here. It has been matter of dispute how the tastes of these fierce Arabians became thus first directed. They probably owed it to the Greeks; but it is certain that what they got they returned with interest. We are said to derive our present arithmetical figures from this strange people; and geometry, astronomy, and alchemy, were their favourite pursuits. The graces of light literature were not neglected, as is shown by the One Thousand and One Nights' Entertainments, a production of this period, which still continues to solace the hours of child-

mood and old age among ourselves, and attests the extent of fancy and the variety of genius among those that gave it birth. Haroun al Raschid, who flourished in the beginning of the ninth century, is celebrated as a second Augustus. He was contemporary with Charlemagne, and communications of a friendly nature are said to have passed between them.

Within fifty years from the death of Mohammed, the Saracens had raised an empire, not only temporal, but also spiritual, more extensive and more powerful than what remained of the empire of Constantinople; and within a hundred, they had subdued not only Persia, Syria, Asia Minor, and Arabia, but also Egypt, North Africa, and Spain. It seemed, indeed, in the course of the eighth century, as if Asia and Europe both should yield to their victorious arms, and become one great Mohammedan dominion. But the mighty fabric, of mushroom growth, crumbled into dust with equal speed. After the first extension of their conquests, they ceased to acknowledge any one head of their empire, and the successful generals of the provinces contented themselves by paying a religious respect to the caliphs of Bagdat, as the successors of the prophet, while they retained the power of conquerors for themselves. In the year 732, they sustained a great defeat in France from Charles Martel, who became the father of an illustrious race of kings. No fewer than 375,000 Saracens are said to have been left dead on the field of this battle, and it is certain that they never after cherished the hope of subduing Europe. About the middle of the ninth century (848), they projected the conquest of Italy, and even laid siege to Rome itself. But they were entirely repulsed by Pope Leo IV.; their ships were dispersed by a storm, and their army cut to pieces. Spain was the only European country in which they were able to obtain a permanent footing, and in it alone have they left traces of their existence.

FROM THE DESTRUCTION OF ROME TO THE AGE OF CHARLEMAGNE.—ORIGIN OF THE FEUDAL SYSTEM.

The empire of the Cæsars fell in the west only by degrees, and the changes introduced by the northern tribes were gradual, though they proved great. Province after province yielded to the invaders; and before the end of the fifth century, every country in Europe had undergone extensive changes, and received fresh accessions to the number of its inhabitants. The Visigoths had seated themselves in Spain, the Franks in Gaul, the Saxons in the Roman provinces of South Britain, the Huns in Pannonia, and the Ostrogoths in Italy and the adjacent provinces. And not only had they been enabled to take up their abode, but in general they became masters, and changed the face of all that they touched: "new governments, laws, languages; new manners, customs, dresses; new names of men and of countries, prevailed; and an almost total change took place in the state of Europe." That change has been called a change from light to darkness, and it assuredly led to the extinction of that taste for literature and that regular administration of government which were the relieving features of the Roman despotism. But if it thus produced an immediate evil, it led to an ultimate good. The population was improved by the admixture of the new races, and from the new elements it had acquired, sprung institutions which might be considered as in many respects an improvement upon those which formerly prevailed.

It was out of these new circumstances that what has been called the Feudal System took its rise. This was a feature in society unknown in former ages. Hitherto men had been the slaves of individual masters, or, as in the more celebrated states of antiquity, they were bound together by the common tie of citizenship, and owed allegiance to none. Patriotism was their highest virtue, and all looked upon the state as a parent, to which, having got support from it, they were bound to give support in their turn. But in these times the rude inhabitants of the north had formed little or no conception of what a state was; and at first they were not prepared to relinquish their much-cherished individual freedom, in exchange for rights which they thought they did not need. Changes at length came over them; and society gradually took new forms. Those who had led them on to battle, began to be looked upon as their guardians in peace. Victorious armies, cantoned out into the countries which they had seized, continued arranged under their officers, each of whom had a separate territory allotted to him, on which he could retain and support his immediate followers, while the principal leader had the largest; and in this way all were bound in allegiance, both to their immediate superiors and to their chief, and all were in readiness to be called out to arms whenever their services were thought to be required. This "military chieftainship," infusing itself as an element in the barbarian societies, was the first advance to any thing like civil or social government, since the extinction of the Roman power. Nations, indeed, were still far from having the advantage of a regular government. The method of conducting judicial proceedings, and of administering justice, was still peculiarly unsettled and uncertain. The authority of the magistrate was so limited, and the independence assumed by individuals so great, that they seldom admitted any umpire but the sword. It was then that trial by ordeal became universal, and men's guilt or innocence was thought to be proved by the capacity of their bodies to withstand the influences of red-hot iron, or boiling water applied to them, or by their overcoming their accuser in single combat.

These observations are applicable, with scarcely any variation, to all the nations which settled in Europe during the fifth and sixth centuries. Speaking of this subject, Dr. Robertson says—"Though the barbarous nations which framed it [the Feudal System], settled in their new territories at different times, came from different countries, spoke various languages, and were under the command of separate leaders, the feuds' policy and laws were established, with little variation, in every kingdom of Europe. This amazing uniformity hath induced some authors to believe that all these nations, notwithstanding so many apparent circumstances of distinction, were originally the same people. But it may be ascribed, with greater probability, to the similar state of society and of manners to which they were accustomed in their native countries, and to the similar situation in which they found themselves on taking possession of their new domains." We shall now say a few words about them individually.

No people at this period exhibited a more energetic character than the Franks, a Teutonic race originally settled on the Lower Rhine and Weser, and who had acquired their name (free-men) while successfully resisting the Roman power in an earlier age. About the year 486, they were under the rule of Clovis, who achieved the conquest of Gaul by the defeat of the Roman governor, and afterwards added Burgundy and Aquitaine to his dominions, the former by marriage, and the latter by the forcible expulsion of the Visigoths. This may be considered as the foundation of the French monarchy. Clovis adopted the Christian faith, and caused his people to follow his example. It is remarkable that, while in war he exercised unlimited power over his subjects, they shared with him the legislative authority, meeting annually in the Champs de Mars to suggest and deliberate upon public measures, in the settlement of which the meanest soldier had equally a voice with his sovereign.

At the death of Clovis in 511, his four sons divided the kingdom, which was afterwards reunited, divided again, and again united, amidst scenes of tumult and

bloodshed. The line of kings proceeding from Clovis (called Merovignian, from his grandsire Meroveus), dwindled in time into utter insignificance, while the chief power was wielded by an important officer, called the Mayor of the Palace. Among the most remarkable of these was Pepin Heristal, Duke of Austrasia, who ruled France for thirty years with great wisdom and good policy. His son, Charles Martel, who succeeded to his power, distinguished himself by that great victory over the Saracens (732), which checked their career in Europe.

An appeal by Pepin le Bref, the son of Charles Martel, to the Pope of Rome, whose authority had by this time become great, ruled that he who had the power should also have the title of king, and this put an end to the reign of the descendants of Clovis (752). Pepin remunerated the pope for this service by turning his arms against the Lombards in Italy, some of whose dominions he conferred upon the Holy See; and these, it is said, were the first of the temporal possessions of the church. Pepin died (768), leaving two sons, Carloman and Charles, who succeeded him in the empire. Carloman died at an early period of life, but Charles survived to achieve for himself a fame greater than that of any other individual during the middle ages, with, perhaps, the single exception of Mohammed. We shall proceed to speak of him and of his times, after making one or two observations on some other European countries.

Spain was among the earliest countries lost to the Roman empire. From about the year 406, this country, in whole or in part, had been successively invaded and subdued by Suevi, Alains, Vandals, and Visigoths. The last-named people were in possession of the greater part of the country before the year 585, and erected a monarchy which existed till 712, when they were subdued by the Saracens or Moors. The Saracens made their descent on Spain from Africa, where Muza, a viceroy of the Caliph of Bagdat, had already made extensive conquests. They easily overran Spain and vanquished Don Rodrigo, or Roderic, the last of the Gothic kings. Abdallah, son of Muza, married the widow of Roderic, and the two nations entered into union. Before the conclusion of the eighth century, Abdalrahman, one of the Moorish generals, had laid aside all temporal subjection to the Caliph of Bagdat, and formed Spain into an independent kingdom. His residence was at Cordova, and this city became renowned as one of the most enlightened in Europe, under several succeeding reigns. Those parts of Spain which were under the Moorish kings embraced also their religion. The north never was.

Towards the conclusion of the sixth century, Italy was in the possession of the Longobeards, or Lombards, who continued masters of the greater part of it for two centuries. Of their rule, history has recorded little besides murders and confusion.

It was during this period that the Saxon Heptarchy was formed in Britain.

CHARLEMAGNE—THE NEW WESTERN EMPIRE.

By far the greatest character who appeared in Europe at this period was Charles, the son of Pepin le Bref, and known in history by the name of Charlemagne, or Charles the Great. "In the course of a reign of forty-five years, Charlemagne extended the limits of his empire beyond the Danube, subdued Dacia, Dalmatia, and Istria, conquered and subjected all the barbarous tribes to the banks of the Vistula, made himself master of a great portion of Italy, and successfully encountered the arms of the Saracens, the Huns, the Bulgarians, and the Saxons. His war with the Saxons was of thirty years' duration; and their final conquest was not achieved without an inhuman waste of blood. At the request of the pope, and to discharge the obligations of his father Pepin to the holy see, Charlemagne, though allied by marriage to Desiderius, King of the Lombards, dispossessed that prince of all his dominions, and put a final period to the Lombard dominion in Italy (774)."—(*Tytler.*)

When Charlemagne made his first entry into Rome, he was crowned King of France and of the Lombards by Pope Adrian I.; and afterwards, on a second visit, he was consecrated Emperor of the West by the hands of Pope Leo III. (800.) He probably attached some importance to these rites; but it is to be remarked that, as yet, the pontiff was not in enjoyment of that high influence by which he afterwards could confer or withdraw sovereignty at his pleasure.

"It is probable" says Mr. Tytler, "that, had Charlemagne chosen Rome for his residence and seat of government, and at his death transmitted to his successor an undivided dominion, that great but fallen empire might have once more been restored to lustre and respect; but Charlemagne had no fixed capital, and he divided even in his lifetime his dominions among his children" (806). Charlemagne died in the year 814, aged 72. His last days were employed in consolidating, rather than extending, his empire, by the making of laws which have rendered his name famous, and his memory even blessed. "Though engaged in so many wars," says Dr. Russell, "Charlemagne was far from neglecting the arts of peace, the happiness of his subjects, or the cultivation of his own mind. Government, manners, religion, and letters, were his constant pursuits. He frequently convened the national assemblies, for regulating the affairs both of church and state. In these assemblies he proposed such laws as he considered to be of public benefit, and allowed the same liberty to others; but of this liberty, indeed, it would have been difficult to deprive the French nobles, who had been accustomed, from the foundation of the monarchy, to share the legislation with their sovereign. His attention extended even to the most distant corners of his empire, and to all ranks of men. He manifested a particular regard for the common people, and studied their ease and advantage. The same love of mankind led him to repair and form public roads; to build bridges, where necessary; to make rivers navigable for the purposes of commerce; and to project that grand canal which would have opened a communication between the German Ocean and the Black Sea, by uniting the Danube and the Rhine." Amidst all his greatness, his personal habits were simple; his dress was of the plainest sort, and such even as to shame his own courtiers: his hours of study were set apart, and seldom omitted even in the busiest times of his life; his daughters were taught spinning and housewifery, and his sons trained by himself: in all the accomplishments of the age. Charlemagne was fond of the company of learned men, and greatly encouraged their residence in his dominions. In this respect he resembled his contemporary Haroun al Raschid, so famous in Arabian history, and Alfred the Great, who appeared in England shortly after this period. Superior to all national prejudice, he elevated an Englishman named Alcuin to the head of his royal academy. He was zealous for the extension of Christianity; and one of the few blots upon his name arises from his having, in the spirit of his age, caused 4000 Saxon prisoners to be beheaded in one day, because they would not submit to be baptized. Charlemagne established schools in the cathedrals and principal abbeys, for teaching writing, arithmetic, grammar, and music.

Of the sons of Charlemagne, Louis, the youngest, surnamed the *Debonnaire*, or gentle, was the only one who survived. He succeeded to all his father's dominions, except Italy, which fell into the hands of Bernard, a grandson of Charlemagne. Louis, deficient in vigour of character, was not able to hold together the great

empire left to him by his father. Having, among the first acts of his reign, given large portions of it to his children, the remainder of his life was spent in disgraceful quarrels with them; and, after his death (840), the empire was formally divided—Lothaire, his eldest son, obtaining Lorraine and Provence; while Charles the Bald, a younger son, continued sovereign of the western parts of France; and Louis became King of Germany. Thus abruptly ends the history of the second western empire.

FRANCE FROM THE TIME OF CHARLES THE BALD TO THE ELEVENTH CENTURY.

During the reign of Charles the Bald, France first suffered from the attacks of the Normans, a race of bold and needy adventurers from the north of Europe. Their plundering invasions were continued for upwards of seventy years; till at length (912) the French king was compelled to purchase their amity, by yielding to Rollo, their leader, the country, afterwards from them called Normandy, of which Rouen was the capital. The first successor of Charles the Bald with whose name history has associated any thing worth remembering, was Charles, surnamed the Fat (885). He was the son of that Louis to whom Germany had been before assigned, and was thus enabled to bring that country and France for a short time once more under a single ruler. In the turbulence of the times, Charles was soon deposed, and during the century which followed, France, so lately the centre of an empire little less than that of Rome in the days of its Cæsars, was split up into a multitude of independencies, by nobles who would own only a very slender subjection to the kings. Out of these nobles at last sprang Hugh Capet (987), who was enabled, on the death of Louis V., to place himself on the throne. He was already possessed of great property, and proved to be also a prince of much ability and penetration. He established the royal residence at Paris, which his predecessors had descended, became the founder of a family which still, in one of its branches, occupies the throne of France. He deserves to be mentioned with honour, as being among the first of European kings who trusted to prudence, counsel, and moderation, rather than force of arms, in effecting his purposes. His success was great, as it deserved to be. On his death (996), in the fifty-seventh year of his age and the tenth of his reign, he was succeeded by his son Robert, who had all his father's equitable disposition without his vigour of character. He was subjected to a degree of tyranny, on the part of the church, of which perhaps the history of the world does not afford such another example. Robert had been guilty of marrying a cousin in the fourth degree, without a *dispensation* from the holy see, that is, without paying a fine for what was only an imaginary offence. Gregory V., who then occupied the pontifical chair, threatened to excommunicate Robert if he should not dismiss his wife, and, on Robert's refusal, actually did so, and laid all his dominions under an interdict. This punishment proved tremendous in its effects; for though the king himself showed sense and courage enough to despise the wrath of the pontiff, yet his subjects deserted him in terror. The priests, in consequence of the interdict, refused sacrament to the sick all over the country, and the dead were everywhere left unburied, when mass was no longer said. In these circumstances, the unfortunate king submitted. A second marriage, contracted with the consent of the church, proved very unhappy. The new queen, Constantia, or Constance, made many efforts to embroil her husband and his family, and in the midst of these Robert died (1031). His son Henry succeeded, and it was during his reign that those pilgrimages to the Holy Land, which were so soon to end in the Crusades, took their rise. Of these we shall speak by themselves. In the mean time we take leave of France by mentioning that Henry's successor was Philip (1060), whose reign is remarkable as having witnessed the beginning of those contests with England which continued at intervals till the early part of the nineteenth century.

At this period (1066), the Normans invaded and conquered England, where their leader, William Duke of Normandy, became the founder of an important dynasty.

THE GERMAN EMPIRE TILL THE ELEVENTH CENTURY.

Germany had no political existence till the time of Charlemagne, when it was formed by him into a part of the western empire. Towards the conclusion of the ninth century, it became an empire of itself. In the year 887, Arnold, a natural son of Carloman, and nephew of Charles the Fat, was declared emperor by an assembly of bishops and nobles. These assemblies in Germany always retained a voice in the election of their emperors; and though they often made their choice from the line of succession, they never acknowledged any hereditary rights whatever. After the death of Arnold's son, called Louis III., their choice fell upon Conrad, Duke of Franconia (912). Conrad's successor was Henry I., surnamed the *Fowler*. He was a prince of great abilities, and introduced order and good government into the empire. "He united the grandees and curbed their usurpations; built, embellished, and fortified cities; and enforced, with great rigour, the execution of the laws in the repression of all enormities. He had been consecrated by his own bishops, and maintained no correspondence with the see of Rome. His son, Otho the Great, who succeeded him (938), united Italy to the empire, and kept the popedom in complete subjection. He made Denmark tributary to the imperial crown, annexed the crown of Bohemia to his own dominions, and seemed to aim at a paramount authority over all the sovereigns of Europe."

In these times the papacy was much disordered. "Formosus, twice excommunicated by Pope John VIII., had himself arrived at the triple crown. On his death, his rival, Pope Stephen VII., caused his body to be dug out of the grave, and after trial for his crimes, condemned it to be flung into the Tiber. The friends of Formosus fished up the corpse, and had interest to procure the deposition of Stephen, who was strangled in prison. A succeeding pope, Sergius III., again dug up the ill-fated carcass, and once more threw it into the river. Two infamous women, Marosia and Theodora, managed the popedom for many years, and filled the chair of St. Peter with their own gallants or their adulterous offspring."—*Tytler*. It was amidst this confusion and these disturbances that Otho was induced to turn his arms on Italy. He shortly became master of it all, and had himself declared emperor by the holy see, with all the pomp that had attended the same ceremony to Charlemagne (962). Pope John XII., whom Otho had been the means of raising to the pontifical chair, rebelled soon after. Otho returned to Rome in fury, had John deposed, hanged one-half of the senate before he left the city, and wrung a solemn acknowledgment from an assembly of reluctant bishops, that the emperor had a right not only to nominate to vacant bishoprics, but also to elect the pope himself. Otho died (972), and was followed in succession by Otho II., Otho III., St. Henry, Conrad II., and Henry III., the history of whose reigns exhibits nothing instructive, or upon which the mind can rest with pleasure. Henry IV. (1056) was a distinguished victim of papal tyranny. The celebrated Hildebrand, known as Gregory VII., was in this age the means of raising the power of the church to a height which it had never reached before. During Henry's contest with this daring and ambitious pontiff, he made him twice his prisoner, and twice did the thunders of the Vatican

excommunicate and depose him in consequence. As a specimen of the power and insolence of this pope, we may mention that Henry, dispirited by the effect which his excommunication had upon his friends and followers, having resolved to go to Rome and ask absolution from Gregory in person, did so; and, presenting himself as an humble penitent at the palace of St. Peter, was there stripped of his robes, and obliged to remain in that condition, in an outer court, in the month of January (1077), barefooted, among snow, and fasting, for three successive days, before he was allowed to implore forgiveness for his offences! On the fourth day he was permitted to kiss the toe of his holiness, and then received absolution! Henry died in the year 1106.

ITALY, FROM THE NINTH TO THE ELEVENTH CENTURY.

The state of Italy during this period has been already partially noticed in the preceding section. From the time of Lothaire, to whom it was nominally assigned as a separate kingdom (843), to that of Otho the Great, (964), the country was ravaged by contending tyrants. Between the invasions of the Normans and the claims of the German emperors, it became much distracted, and was ultimately split up into several independent states. Some of these, particularly Venice, Genoa, Pisa, and Florence, became afterwards independent and powerful republics. It was during the present period that the foundation of the temporal power of the popes was laid.

SPAIN, FROM THE TIME OF ABDALRAHMAN TILL THE ELEVENTH CENTURY.

During the period of which we have been treating, Spain seemed less a part of Europe than any other country in it. The greater part of it still continued under the dominion of the Moors, and apparently with advantage. "This period," says Mr. Tytler, "from the middle of the eighth to the middle of the tenth century, is a most brilliant era of Arabian magnificence. While Haroun al Raschid made Bagdat illustrious by the splendour of the arts and sciences, the Moors of Cordova vied with their brethren of Asia in the same honourable pursuits, and were undoubtedly at this period the most enlightened of the states in Europe. Under a series of able princes, they gained the highest reputation, both in arts and arms, of all the nations of the west." And yet these eastern conquerors seem to have had their troubles as well as others. A race of powerful nobles among them, as in the other countries of Europe, distracted the country and made effective government impossible. The Christian part of the population, still possessed of several provinces in the north, might have taken advantage of such a state of things for repossessing themselves of their lost country. But civil dissension was still greater among themselves, and Christian princes readily formed alliances with the Moors, if they saw a prospect of weakening an immediate enemy by that means, forgetting that the common foe still remained to harass them. But the detail of these numerous and petty contentions need not detain us longer; nor does the history of Spain assume any importance till towards the conclusion of the fifteenth century, when the united arms of Ferdinand and Isabella expelled the Moors for ever from the country.

GENERAL STATE OF EUROPE IN THE ELEVENTH CENTURY.

Before the end of the tenth century, Europe had reached a point of darkness and degradation, beyond which it seemed impossible to go. Though long nominally converted to the Christian religion, the nations of Europe may be said to have scarcely exhibited, up to this period, a single distinctive mark of what men understand by Christian civilization. "The barbarous nations," says Dr. Robertson, "when converted to Christianity, changed the object, not the spirit of their religious worship. They endeavoured to conciliate the favour of the true God, by means not unlike to those which they had employed in order to appease their false deities. Instead of aspiring to sanctity and virtue, which alone can render men acceptable to the great Author of order and of excellence, they imagined that they satisfied every obligation of duty by a scrupulous observance of external ceremonies. Religion, according to their conception of it, comprehended nothing else; and the rites by which they persuaded themselves that they should gain the favour of Heaven, were of such a nature as might have been expected from the rude ideas of the ages which devised and introduced them. They were either so unmeaning as to be altogether unworthy of the Being to whose honour they were consecrated, or so absurd as to be a disgrace to reason and humanity. Charlemagne in France, and Alfred the Great in England, endeavoured to dispel this darkness, and gave their subjects a short glimpse of light and knowledge. But the ignorance of the age was too powerful for their efforts and institutions. The darkness returned, and settled over Europe, more thick and heavy than before." The clergy were the only body of men among whom any knowledge or learning now remained; and this superiority they employed to continue, if not to deepen, the degradation into which society had fallen. The superstitious belief that more crimes could be expiated by presents to the Deity, if not originated by them, at least found them its strenuous defenders, for the reason that a gift to God meant, in plainer language, a *solatium* to the church. The priests would have made men believe that avarice was the first attribute of the Deity, and that the saints made a traffic of their influence with Heaven. Hence Clovis is said to have jocularly remarked, that, "though St. Martin served his friends very well, he also made them pay well for his trouble."

Persons in the highest ranks and most exalted stations, could neither read nor write. Of the clergy themselves, many of them did not understand the Breviary which it was their duty to recite; and some of them, it is said, could scarcely read it. Those among the laity who had to express their assent in writing, did so by a sign of the cross attached to the document (sometimes also by a seal;) and to this day, in consequence, we speak of *signing* a document, when we subscribe our names.

The evils of the feudal system, too, had by this time become excessive and insupportable. Every petty chief was a king in his own dominions, and their vassals were their subjects, if, indeed, they should not be called slaves. These barons made laws of their own, held courts of their own, coined money in their own names, and levied war at their own pleasure against their enemies; and these enemies were not unfrequently their kings. Indeed, the kings of these times can be looked upon in no other light than as superior lords, receiving a nominal and empty homage for lands, which, in the fictitious language of feudal law, were said to be held of the crown. In these circumstances, what might we expect to be the condition of the great body of the people? They were either actual slaves, or exposed to so many miseries, arising from pillage and oppression, that many of them made a voluntary surrender of their liberty in exchange for bread and protection from the feudal lords. There *was* no people, as that term is now understood. "There was nothing morally in common," says Guizot, "between the lord and the serfs; they formed part of his domains, and were his property; under which designation were comprised all the rights that we at present call rights of public sovereignty, as well as the privileges of private property, he having the right of giving laws, of imposing taxes, and of inflicting punishment, as

well as that of disposing and selling. In fact, as between the lord and the labourers on his domain, there were no recognised laws, no guarantees, no society, at least so far as may be predicated of any state in which men are brought into contact." In what away society rose above so many accumulated evils, and light sprang from so much darkness, we shall now endeavour to show. The most remarkable and the most lasting influence, beyond all question, was that exerted by

THE CRUSADES.

"It is natural to the human mind," says Dr. Robertson, "to view those places which have been distinguished by being the residence of any celebrated personage, or the scene of any great transaction, with some degree of delight and veneration. To this principle must be ascribed the superstitious devotion with which Christians, from the earliest ages of the church, were accustomed to visit that country which the Almighty had selected as the inheritance of his favourite people, and in which the Son of God had accomplished the redemption of mankind. As this distant pilgrimage could not be performed without considerable expense, fatigue, and danger, it appeared the more moritorious, and came to be considered as an expiation for almost every crime. An opinion, which spread with rapidity over Europe about the close of the tenth and beginning of the eleventh century, and which gained universal credit, wonderfully augmented the number of credulous pilgrims, and increased the ardour with which they undertook this useless voyage. The thousand years mentioned by St. John [Rev. xx. 2, 3, 4] were supposed to be accomplished, and the end of the world to be at hand. A general consternation seized mankind; many relinquished their possessions, and, abandoning their friends and families, hurried with precipitation to the Holy Land, where they imagined that Christ would quickly appear to judge the world."*

"While Palestine continued subject to the caliphs, they had encouraged the resort of pilgrims to Jerusalem, and considered this as a beneficial species of commerce, which brought into their dominions gold and silver, and carried nothing out of them but relics and consecrated trinkets. But, the Turks having conquered Syria about the middle of the eleventh century, pilgrims were exposed to outrages of every kind from these fierce barbarians. This change happening precisely at the juncture when the panic terror which I have mentioned rendered pilgrimages most frequent, filled Europe with alarm and indignation. Every person who returned from Palestine related the dangers which he had encountered, in visiting the holy city, and described with exaggeration the cruelty and vexations of the Turks."

Among the most notorious of those who had returned with these accounts, was a monk known by the name of Peter the Hermit. By all accounts this individual seems to have been a weak-minded and contemptible being. He is represented as running from city to city, and from kingdom to kingdom, bare-headed, with naked arms and legs, and bearing aloft a ponderous crucifix in his hand, imploring and preaching with an enthusiastic madness on the necessity of wresting the Holy Land from the hands of the infidels. In a more enlightened age, Peter the Hermit would probably have been confined as a troublesome lunatic; in this, however, he was not only allowed to go on, but encouraged and abetted in his career. The ambitious Hildebrande had expressed a strong desire to send armed forces from Europe to exterminate the Mohammedans from Palestine, in order that another country might be brought under his spiritual subjection; and Urban II., who at this time occupied the chair of St. Peter, warmly seconded the efforts of the enthusiastic monk. Nor was Peter's success small. Vast multitudes proclaimed themselves ready to engage in he undertaking. Two great councils of the church, one of them held at Placentia and the other at Clermont, in Auvergne, attended by prelates, princes, and immense multitudes of the common people, declared enthusiastically for the war (1095). The pope himself attended at the last, and Peter and he having both addressed the multitude, they all exclaimed, as if impelled by an immediate inspiration, "It is the will of God! it is the will of God!" These words were thought so remarkable, that they were afterwards employed as the motto on the sacred standard, and came to be looked upon as the signal of battle and of rendezvous in all the future exploits of the champions of the cross. Persons of all ranks now flew to arms with the utmost ardour. The remission of penance, the dispensation from those practices which superstition imposed or suspended at pleasure, the absolution of all sins, and the assurance of eternal felicity, were the rewards held out by the church to all who joined the enterprise; and "to the more vulgar class," says Mr. Hallam, "were held out inducements which, though absorbed in the overruling fanaticism of the first Crusade, might be exceedingly efficacious when it began to flag. During the time that a crusader bore the cross, he was free from suits for his debts, and the interest of them was entirely abolished; he was exempted, in some instances at least, from taxes, and placed under the protection of the church, so that he could not be impleaded in any civil court, except in criminal charges or questions relating to land." It was in the spring of the year 1096, that Peter the Hermit set out for Judea, at the head of a promiscuous assemblage of 80,000 men, with sandals on his feet, a rope about his waist, and every other mark of monkish austerity. Soon after, a more numerous and better disciplined force of 200,000 followed, including some able and experienced leaders. Godfrey of Bouillon, Robert, Duke of Normandy (son of William the Conqueror of England), the Counts of Vermendois, Toulouse, and Blois, are a few of the more illustrious. The progress of this immense mass of human beings on their journey was marked by misery and famine. They had vainly trusted to Heaven for a supernatural supply of their wants, and in their disappointment, they plundered all that came in their way. "So many crimes and so much misery," says Mr. Hallam, "have seldom been accumulated in so short a space, as in the three years of the first expedition;" and another historian says, that a "fresh supply of German and Italian vagabonds," received on the way, were even guilty of pillaging the churches. It is certain that before the hermit reached Constantinople, the number of his forces had dwindled down to 20,000. Alexis Comnenus, then Emperor of Constantinople, who had applied to the states of Europe for assistance, without much hope of obtaining it, in order that he might be enabled to resist a threatened attack by the Turks upon himself, was surprised and terrified at the motley group of adventurers who had now reached the shore of his dominions. He readily afforded them the means of transporting themselves across the Bosphorus, and performed the same friendly office to the larger force which followed under Godfrey and others; glad, apparently, to have the barbarians of the north, as his subjects called them, out of his dominions. The Sultan Solyman met the army of the hermit, if army it could be called, and cut the greater part of it to pieces on the plains of Nicea. The second host proved more successful. In spite of their want of discipline, their ignorance of the country, the scarcity of provisions, and the excess of fatigue, their zeal, their bravery, and their irresistible force, enabled them twice to overthrow old Solyman, to take his capital, Nice, and

* Mr. Hallam mentions, as corroborative of this general belief, that charters at this period usually commenced with these words: "As the world is now drawing to its close;" and that an army, marching under the Emperor Otho I., was so terrified by an eclipse of the sun, which it conceived to announce this consummation, as to disperse hastily on all sides

after an obstinate resistance, the city of Antioch also (1098). At length (1099) they reached Jerusalem, much diminished in numbers and broken in spirit; but, with persevering assiduity, they proceeded to lay siege to the city, and in six weeks they became its masters. Their cruel conduct to the inhabitants attests the barbarous feelings of their hearts. "Neither arms defended the valiant, nor submission the timorous; no age nor sex was spared; infants on the breast were pierced by the same blow with their mothers, who implored for mercy; even a multitude of ten thousand persons, who had surrendered themselves prisoners and were promised quarter, were butchered in cold blood by these ferocious conquerors. The streets of Jerusalem were covered with dead bodies. The triumphant warriors, after every enemy was subdued and slaughtered, turned themselves, with the sentiments of humiliation and contrition, towards the holy sepulchre. They threw aside their arms, still streaming with blood; they advanced with reclined bodies and naked feet and heads, to that sacred monument; they sung anthems to him who had purchased their salvation by his death and agony; and their devotion, enlivened by the presence of the place where he had suffered, so overcame their fury, that they dissolved in tears, and bore the appearance of every soft and tender sentiment. So inconsistent is human nature with itself, and so easily does the most effeminate superstition ally, both with the most heroic courage and with the fiercest barbarity!"

With a becoming foresight, the Crusaders established a Christian kingdom in the heart of Palestine; and at the head of it, by universal consent, was placed Godfrey, whose goodness and justice had signalized him, and gained him respect, in the midst of the general wickedness. The pope, however, was too eager to enjoy the triumph to which he had looked forward, and sending an ignorant and obtruding ecclesiastic to assume this command, Godfrey retired; and thus was lost, undoubtedly, the best chance that Europeans ever had of really possessing the Holy Land. The Turks had now time to recover their strength and renew their attacks: they did so: many of the Crusaders had in the mean time returned home, and those of them who remained, surrounded and menaced by such foes, at last implored aid from Christendom. There the spirit which had been raised by Peter the Hermit was far from being extinguished; and another, more eloquent and more learned than Peter, namely St. Bernard, had arisen to keep alive the flame of devotion. Roused by his preaching, Europe sent forth a second Crusade (1147). It consisted of 200,000 French, Germans, and English, in two divisions, the first led on by Conrad III. of Germany, and the second by Louis VII. of France. Strangely enough, both these leaders permitted themselves to be drawn into a snare by false guides, furnished by the Greek Emperor; and both armies, one after another, were withdrawn amidst the rocks of Laodicea, and, after being nearly starved by famine, they were cut to pieces by the Sultan of Iconium. This Crusade proved the most disastrous of them all. "Thousands of ruined families," says Russell, "exclaimed against St. Bernard for his deluding prophecies: he excused himself by the example of Moses, who, like him, he said, had promised to conduct the Israelites into a happy country, and yet saw the first generation perish in the desert."

It was shortly after this period that the illustrious Saladin appeared (1180). Born among an obscure Turkish tribe, this individual fixed himself by his bravery and conduct on the throne of Egypt, and began to extend his conquests in the east. The still existing, though wretchedly supported kingdom of the Christians in Palestine, proving an obstacle to the progress of his arms, Saladin directed his power against it, and, assisted by the treachery of the Count of Tripoli, he completely overcame the Christians in battle (1187). The holy city itself fell into his hands, after a feeble resistance and, except some cities on the coast, nothing remained to the Christians of all that, a century before, it had cost Europe so much to acquire. The followers of the cross, however, were not yet wholly disheartened; and a third great Crusade was entered into before the end of the twelfth century. The three greatest sovereigns of Europe, Frederick Barbarossa of Germany, Philip Augustus of France, and Richard Cœur de Lion of England, all took part. The forces of Frederick were earliest in the field. He had passed through the unfriendly territories of the Greek empire, crossed the Hellespont, and defeated the infidels in several battles, before Richard or Philip had stirred from home. The Christians of the East were beginning to look with hope and pride on so great assistance; but they seemed fated to be unfortunate. Frederick died (1190), from having thrown his body, heated by exertion, into the cold river of Cydnus; and his army, like the others that had gone before it, dwindled into nothing. The united armies of Richard and Philip followed. In their progress, the feelings of envy and national hatred rose above the object which had brought them together. Philip returned, disgusted or dismayed, shortly after they reached their destination; and Richard was thus left alone to uphold the glory of European arms. He did it nobly. With a mixed army of French, German, and English soldiers, amounting in all to 30,000, Richard performed feats of valour which have not been surpassed in the history of any time or nation. On the plains of Ascalon, a tremendous battle was fought with Saladin, and that brave and great man was defeated, and 40,000 of his soldiers are said to have been left dead upon the field of battle. But this conquest was unavailing, and the followers of Richard began to fear that there would be no end to their struggles. The zeal which had brought so many of them from their homes, and sustained them so long in absence, at last abated. Saladin readily concluded a treaty by which Christians might still be permitted to visit the tomb of Christ unmolested, and Richard left the Holy Land for ever. It is due to the memory of Saladin (who did not long survive this period) to state, that, after he made himself master of Jerusalem, he never molested the Christians in their devotions—a circumstance which, by contrast, reflects infinite disgrace on the cruel barbarities of the first Crusaders. In his last will, he ordered alms to be distributed among the poor, without distinction of Jew, Christian, or Mohammedan; intending by this bequest to intimate, that all men are brethren, and that when we would assist them, we ought not to inquire what they believe, but what they feel—an admirable lesson to Christians, though from a Mohammedan! But the advantages in science, in moderation, and humanity, seem at this period to have been all on the side of the Saracens.

There were no more great Crusades. Considerable bands of private adventurers still continued to move eastward; but disaster and disgrace attended every effort, and Europe at last became disheartened, when the bones of two millions of her sons lay whitened on the plains of Asia, and so little had been accomplished. Nevertheless, in the year 1202, Baldwin, Count of Flanders, was able to raise another considerable army for the rescue of the Holy Sepulchre; but having reached Constantinople at a time when there was a dispute in the succession to the throne, he readily laid aside the project of the Crusade, took part in the quarrel, and in the course of five months he was himself the emperor. The citizens of Venice, in Italy, who had lent their vessels for this enterprise, shared in the triumphs of the piratical Crusaders; they obtained the Isle of Candia, or Crete. Baldwin, however, was soon driven from the throne and

murdered, though the Latins, as his successors from the west were called, kept possession of Constantinople for fifty-seven years.

At this period (1227) a great revolution took place in Asia. Gengis Khan, at the head of a body of Tartars, broke down from the north upon Persia and Syria, and massacred indiscriminately Turks, Jews, and Christians, who opposed them. The European settlements in Palestine must soon have yielded to these invaders, had not their fate been for a while retarded by the last attempt at a Crusade under Louis IX. of France. This prince, summoned as he believed by Heaven, after four years' preparation, set out for the Holy Land, with his queen, his three brothers, and all the knights of France (1248). His army began their enterprise, and we may say ended it also, by an unsuccessful attack on Egypt. The king went home, and reigned prosperously and wisely for thirteen years; but the same frenzy again taking possession of him, he embarked on a Crusade against the Moors in Africa, where his army was destroyed by a pestilence, and he himself became its victim (1270).

Before the end of the thirteenth century (1291) the Christians were driven out of all their Asiatic possessions. "The only common enterprise," says Robertson, "in which the European nations were engaged, and which they all undertook with equal ardour, remains a singular monument of human folly."

INSTITUTION OF CHIVALRY.—STATE OF EUROPE DURING AND AFTER THE CRUSADES.

Among the most remarkable institutions of the middle ages, was that of Chivalry. The institution was certainly not the result of caprice, nor a source of unmixed extravagance, as it has been represented, but an effort of human nature to express its feelings of love, honour, and benevolence, at a time when the spirit of liberty was extinguished, and religion had become debased. The feudal state was a state of perpetual war, rapine, and anarchy, during which the weak and unarmed were often exposed to injuries. Public protective law scarcely had an existence; and in these circumstances assistance came oftenest and most effectually from the arms of private friends. It was the same feeling of courage, united to a strong sense of duty, which both gave rise to chivalry, and led such multitudes to join the Crusades. Chivalry existed before them, and it survived them. Those who devoted themselves to a life of chivalry were called knights, and sometimes knight-errants, in allusion to their habits of wandering from one country to another in search of helpless objects, which their generosity might find a pleasure in relieving and defending. Admission to the order of knighthood was long reckoned an honour of the highest sort; and to fulfil the vows which entrants took upon them, might well be considered so. They were bound, "by God, by St. Michael, and St. George," to be loyal, brave, and hardy; to protect the innocent, to redress the injuries of the wronged; and, above all, to uphold and defend the characters of women. The institution of chivalry is sometimes thought to have thrown an air of ridiculousness upon every thing connected with the softer sex, and some of the vagaries of knight-errantry give sufficient countenance to such a supposition; but on the whole we are bound to rate its beneficial influences in elevating the female character high indeed, when we contrast the gross and grovelling situation held by the sex in former times with the high and virtuous emotions that we have learned to associate in modern times with the name of woman. If the whole of this effect is not to be ascribed to chivalry, not a little of it must certainly be so; nor do its beneficial effects end here. The feelings of honour, courtesy, and humanity, which distinguished it, spread themselves into other parts of conduct. War, in particular, was conducted with less ferocity, and humanity came to be deemed as necessary to an accomplished soldier as courage. The idea of a *gentleman* is wholly the production of chivalry; and during the twelfth, thirteenth, fourteenth, and fifteenth centuries, a sense of honour and a refinement of manners towards enemies sprung up, which have extended to modern times, and form a distinguishing feature of them.

The history of the Crusades has carried us over nearly two centuries of the history of Europe. But Europe might be said, almost without exaggeration, to have been then in Asia. It was certainly not the scene of any transaction of importance during all that period. The numerous quarrels, both public and private, which had before agitated the several countries, and had constituted all their history, gave way, by mutual consent, as well as by the orders of the church, to the one idea which then reigned supreme among them. Society was thus unconsciously the means of permitting some of those powerful and pacific principles to come into play, which were soon to give it a new destiny. The absence of so many great barons, during the time of the Crusades, was a means of enabling the common people, who had hitherto lived as their slaves, to raise themselves in public standing and estimation; while the possessions of many of these barons, by sale, or the death of their owners without heirs, reverted to the sovereigns. In this way the power of the people and of royalty advanced together, and both at the expense of the class of nobility. The people were not unwilling to exchange the mastery of inferiors for that of a superior; and the kings on their part looked on this rising power of the people with pleasure, as it offered a shield to protect them from the insolence of the nobles. In these circumstances boroughs began to flourish. This was a new element in the progress of civilization. Men who had hitherto skulked in castles, and had sacrificed their liberties and their lives for bread and protection from isolated chiefs, now found that, by a union among themselves, they might secure bread by industry, and protection and liberty by mutual aid. Multitudes, therefore, forsook their feudal subservience to enjoy independent citizenship. Villeins, or labourers, joyfully escaped to take their place on a footing of equality with freemen; and sovereigns found means to pass a law that, if a slave should take refuge in any of the new cities, and be allowed to remain there unclaimed for a twelvemonth, he had thereby become free, and was henceforth a member of the community. Another improvement which kings were able to introduce about this time was the gradual abolition of minor courts of justice, which barons had previously held in their several domains, and their getting public and universal law administered by judges of their own appointment. Even single combat, the practice most inveterately adhered to of any among the ancient nobles, became less frequent and less honourable. The more revolting and absurd features of it were wholly abolished, though the great absurdity, and indeed the great crime itself, cannot be said to have become totally extinct, even up to our own day, when we recollect that the barbarous practice of duelling is still permitted to exist.

The effect, however, produced by the Crusades, which proved greatest in its consequences, though perhaps it was the most unlooked for at the time, was the rise of commerce. The first of these expeditions had journeyed to Constantinople by land; but the sufferings were so great, that all the rest were induced to go by sea. The Italian cities of Venice, Genoa, and Pisa, furnished the vessels which conveyed them; and the sums of money obtained for the freight of so many and so great armies were immense. This, however, was but a small part of what the Italian citizens gained by the expeditions to the Holy Land. The Crusaders contracted with them for military stores and provisions; and any of the Asiatic possessions of value, which came temporarily into the

hands of the Christians, became emporiums of commerce for them. The sweet reward of labour was thus first felt for ages in Europe. New arts were brought from the east, and many of those natural productions of the warmer climates were first introduced into the west, which have since afforded the materials of a lucrative and extended commerce. We will allude in a separate section to the brilliant career of several of the Italian Republics.

In these views we represent the fairest side of the picture. There were yet many obstacles in the way of a complete and harmonious evolution of the principles of civilisation. But the elements all seemed now to have acquired existence, and time only was required to consolidate and strengthen them.

CONTINUATION OF THE HISTORY OF EUROPE TO THE MIDDLE OF THE FIFTEENTH CENTURY.—RISE OF SOME NEW POWERS.

The most remarkable general feature of European society about the time of the Crusades was the papal influence. Between the pontiffs and the German emperors there was kept up a perpetual struggle for power; but for a long time the advantage was almost always with the popes. The treatment which some of the emperors received from them was extremely humiliating. Frederick Barbarossa was compelled to kiss the feet of his holiness, Alexander III., and to appease him by a large cession of territory, after having indignantly denied his supremacy, and refused the customary homage. Henry VI., while doing homage on his knees, had his imperial crown kicked off by Pope Celestinus, who, however, made some amends for this indignity by the gift of Naples and Sicily. Henry had expelled the Normans from these territories, which now became appendages of the German empire (1194). In the beginning of the thirteenth century, Pope Innocent III. was imagined to have permanently established the powers of the holy see, and its right to confer the imperial crown; but this proved far from being the case. In the time of Frederick II., who succeeded Otho IV. (1212), the old contentions rose to more than the usual height, and two factions sprung up in Italy, known by the names of Guelphs and Ghibellines, the former maintaining the supremacy of the popes, and the latter that of the emperors. Frederick maintained the contest which now arose between himself and the popes, with much spirit; but, on his death (1250), the splendour of the empire was for a considerable time obscured. At length, Rodolph of Hapsbourg, a Swiss baron, was elected emperor (1274). Rodolph became the founder of the house of Austria, and ruled with both vigour and moderation. His son, Albert I., was the means of causing the inhabitants of Switzerland to assert and obtain their liberty, by his attempting to bind them in subjection to one of his children, and then using force to compel them. In the pass of Morgarten, a small army of four or five hundred of these brave mountaineers defeated an immense host of Austrians (1315). Sixty pitched battles, it is said, were fought between the contending parties; but the spirit of William Tell, who appeared at this time, and of his patriot countrymen, rose above all attempts to enslave them; and the Swiss cantons secured a freedom which their descendants enjoy to this day. The further history of Germany, for nearly a century, is not politically important. Disputes between the emperors and the papacy still continued, though the balance of advantage was now oftener against the church. About the beginning of the fifteenth century the great papal schism, as it was called, took place. It arose from there being no fewer than three different claimants for the chair of St. Peter—Gregory XII., who was owned Pope by the Italian states; Benedict XIII., by France; and Alexander V., a native of Candia, by a number of the cardinals. This schism proved very hurtful to the authority of the church, though in that respect it benefited the interests of society, and contributed to open men's eyes. The appearance of John Huss at this time aided in producing that effect. Huss proclaimed the same opinions as the great English reformer Wickliffe. He was branded, of course, by the clergy as a heretic and propagator of sedition. The general council of the Church, held at Constance (1514), concocted no fewer than thirty-nine articles in which Huss is said to have erred. Some of the points he denied having professed, and others he offered to support by argument; but his voice was drowned by the clamours of bigotry. His hair was cut in the form of a cross; upon his head was put a paper mitre, painted with the representation of three devils; and he was delivered over to the secular judge, who condemned both him and his writings to the flames. A similar fate shortly after befell his disciple, Jerome of Prague, who is said to have exhibited the eloquence of an apostle and the constancy of a martyr at the stake (1416). In revenge for these cruelties, the Hussites of Bohemia kept up a war with the empire for twenty years; and it was only after having their right to express their opinions acknowledged that they desisted. The great schism lasted for many years. A Neapolitan archbishop, named Bari, was elected and deposed by the resident cardinals at Rome within a few months. Boniface IX. and Innocent VI. were each temporarily his successors. The result of the lengthened dispute may be stated to be, that papal authority was greatly weakened; the government of the church was brought down among a class of ecclesiastics that had never before tasted the sweets of power, and future popes were obliged to resort to such questionable practices for the maintenance of their dignity, that men in general began to lose respect for their sanctity, and a foundation was laid for changes which it fell to the lot of Luther and others to effect.

The period which witnessed these transactions was remarkable for the continued wars between France and England. In the beginning of the twelfth century, the famous dispute for supremacy arose between Thomas-à-Becket, Archbishop of Canterbury, and Henry II, which ended in the death of the prelate (1171), but in the triumph of his principles. The beginning of the thirteenth century is memorable in English history, as having witnessed the granting of the Magna Charta by King John; and towards the conclusion of it appeared Edward I., whose name is associated with the first great attempts to subdue the Scots on the part of England. The bravery of Wallace and of others averted that calamity for ever. Wales was not so fortunate; and Ireland had already become a conquered province. The grandson of Edward I., named Edward III., proved himself as ambitious and as sagacious as his predecessor. His attention, however, was greatly diverted from the kingdom of Scotland to that of France, with which country he commenced a war that proved greater in duration and extent than any that had occurred in Europe since the fall of the Roman empire. The proposal of subduing so great a country as France, and seating himself upon the throne of it, seemed at first to be the proposal of a madman; but in less than twenty years Edward had so effectually dismembered the different provinces, alienating some of the nobility and overawing others, that his attaining the object of his desires seemed by that time no improbable nor distant reality. His son, known in history as Edward the Black Prince, named so from the colour of his armour, contributed much, by his presence and his valour, to the success of the English arms. In the battle of Cressy, fought in 1346, with numbers greatly on the side of France, and in that of Poictiers, fought ten years later, under similar circumstances, the English were completely victorious. John, King of France, was taken prisoner, and the conduct of young Edward to his fallen enemy was generous and

delicate in the highest degree, so that the French prisoners are said to have been overcome by the display of such an elevation of mind on the part of their conqueror, and to have burst into tears. This refinement was the result of chivalry, which both the Edwards attached themselves to, and rendered respectable by their virtues.

France was at this time in a deplorable state. A foreign enemy in the heart of the kingdom, the king a prisoner, the capital in sedition, and civil war raging over and above all—these were some of her accumulated misfortunes; and as if nature meant to conspire with man for her destruction, a plague broke out at this time among the people, and consummated the work of famine and the sword. This plague, however, was not confined to France, though, from the dilapidated state of that country, it proved perhaps in it most disastrous. It invaded every kingdom of Europe, and the English historian, Hume, computes that it swept away about one-third of the inhabitants of every country that it attacked. The origin of the disease is not well known; but there can be no doubt that it could only have made the ravages which it did among nations uncivilized and ignorant, heedless of all the cleanliness and comforts which we know, in modern times, to be necessary to the preservation of health. According to the ordinary account, this pestilence took its rise in the Levant about the year 1346, from whence Italian traders brought it to Sicily, Pisa, and Genoa. In 1348, it passed the Alps, and spread over France and Spain. In the next year it reached Britain, where, in London alone, 50,000 persons are said to have become its victims; and in 1350, it laid waste Germany and other northern states, lasting generally in each country about five months. At Florence more than three out of every five of the inhabitants were swept away. It is well known to those acquainted with Italian literature, that the time of Boccaccio's Decameron is laid during this pestilence.

While the plague lasted, a temporary truce had been agreed upon between the French and English. At that time the balance of advantage was greatly in favour of the English. Not to mention less important gains, all Guienne, Gascony, Poitou, Saintonge, the Limousin, and the Angoumois, as well as Calais, and the county of Pointhieu, were ceded in full sovereignty to Edward, and the empty title of King of France was all that he became bound to give up (1360). But it was found impossible to retain possessions in the heart of a foreign country, though won by consummate bravery and ruled with no imprudence. In less than ten years (1368), the war was recommenced, and the English began to lose many of the provinces which they had previously acquired. Charles V., who had acted as regent in France during the captivity of his father John, and was now his successor on the throne, contributed greatly by his wisdom to this result; and his general, Du Guesclin, contributed not less to it by his valour. England had lost both its Edwards, and Richard II. proved destitute of abilities for leading on the enthusiasm of his countrymen to any thing great. Charles died prematurely, however, a circumstance which proved unfortunate for France, as his son, the sixth of the same name, was a very unworthy successor. For forty years, Charles VI. may be said to have borne the name of king, rather than to have reigned in France. The wealth accumulated by Charles the Wise, was, in the first place, stolen by the Duke of Anjou, and afterwards, by reason of want of funds, and misapplication of what they had, Charles VI. and his ministers were fully more engaged in quarrels with the citizens of Paris and other subjects, than in any becoming efforts to expel the English. History records, however, that the king became totally imbecile in mind (1393), so that he was, by universal consent, excluded from all share in the government, and the houses of Burgundy and Orleans long struggled for the regency. At this period, Henry V. of England put in a claim for the government of the kingdom, on the strength of a distant relationship to the reigning family; and, after having gained the memorable battle of Agincourt (1415), he was actually promised the throne on the death of Charles, though his own death prevented this from ever taking place. It may be worth remarking, that *cards* were invented in this age. The desire to amuse the silly king of France was the cause. In the year 1422 Charles VII., surnamed the Victorious, was crowned King of France at Poictiers, while the crown was claimed on the part of Henry VI. of England, yet an infant. The war continued, and the English were like to have proved victorious, when a simple maiden, named Joan of Arc, made her appearance at the head of the armies of France, and turned the tide of fortune in favour of her country. Apparently mistaking the impulses of superstition for divine inspiration, she gave out that she had been commissioned by Heaven to save her country; and having succeeded in inspiring the French soldiery with that belief, she led them on to battle, and they proved victorious. It must be recorded, to the disgrace of our countrymen, that Joan, being shortly after taken prisoner, was condemned to be burnt as a sorceress. The French, however, were but the more exasperated at this; and their victory of Formigny, and the death of Talbot, perhaps the greatest English warrior of the age, now left them in possession of all their country, with the exception of Calais and Greignes (1450).

Of all that was done by England to obtain a footing in France, a barren title to our sovereigns alone is all that was preserved till a recent period. The power and spirit of the French nation rose above all calamities, and in less than half a century, having freed herself of every enemy at home, her arms were in a condition to be directed externally with effect. The invasion of Naples by Charles VIII. was the event that first engaged the principal states of Europe in relations of alliance or hostility, which may be deduced to the present day, and is the point which most appropriately terminates the history of the middle ages.

During this period, several of those countries in the north of Europe, which have made a considerable figure in modern history, for the first time attracted attention. The greatest of these was Russia. In the middle of the thirteenth century, the tribes of Tartary made a complete conquest of this country, and for about a hundred years they maintained their supremacy. At length Ivan ascended the throne of Moscow (1462), and overcoming the Tartars, established a kingdom of his own, and was able to form an alliance with the Emperor Maximilian of Germany, who did not hesitate to style him brother. This was the first entrance of Russia into European politics.

Before the end of the fourteenth century, the Christian religion had penetrated into Denmark, Sweden, Prussia, and Poland; but it failed in producing any immediate beneficial effect. The political events which took place in these countries, however, were very various at this period, but proved too unimportant in their results to admit of being even outlined here.

THE ITALIAN REPUBLICS.—COMMERCE IN GENERAL.

Among the Italian cities, Venice, at the extremity of the Adriatic, Ravenna, at the south of the mouth of the Po, Genoa, at the foot of the Ligurian mountains, Pisa, towards the mouths of the Arno, Rome, Gaëta, Naples, Amalphi, and Bari, were either never conquered by the Lombards, or were in subjection too short a time to have lost many of their ancient habits and customs. In this way, these cities naturally became the refuge of Roman civilization, at a time when other parts of Europe were wading through barbarian darkness. The feudal system never prevailed among them with any force and several

of these and other cities had important privileges conferred upon them by the German emperors at a very early period. Sismondi, the historian of Italy, asserts that Otho I. (936) erected some of them into municipal communities, and permitted them the election of their own magistrates. It is certain that, in 991, the citizens of Milan rose in tumult, expelled an archbishop from their city, and were able to establish a qualified right to interfere in future elections. The after history of Milan is eventful and tragical; but we can only give a short account of it here. In the middle of the twelfth century, Frederic Barbarossa became engaged with the cities of Lombardy, and particularly with it, in extensive and destructive wars. In the year 1162, Milan was finally overcome; the walls and houses were razed from their foundation, and the suffering inhabitants dispersed over other cities, obtaining sympathy in their distress, and communicating their enthusiastic love of freedom in return. The republican form of government was adopted in every considerable town; and before the end of the thirteenth century, there was a power and knowledge among these apparently insignificant republics that all Europe could not match.

The beneficial though unlooked-for effect of the Crusades upon commerce has already been mentioned. During the twelfth and thirteenth centuries, the commerce of Europe was almost entirely in the hands of the Italians, more commonly known in those ages by the name of Lombards. The republic of Pisa was one of the first to make known to the world the riches and power which a small state might acquire by the aid of commerce and liberty. Pisa had astonished the shores of the Mediterranean by the number of vessels and galleys that sailed under her flag, by the succour she had given the Crusaders, by the fear she had inspired at Constantinople, and by the conquest of Sardinia and the Balearic Isles. Immediately preceding this period, those great structures which still delight the eye of the traveller—the dome, the baptistry, the leaning tower, and the Campo Santo of Pisa, had all been raised; and the great architects that spread over Europe in the thirteenth century, had mostly their education here. But, unfortunately, the ruin of this glorious little republic was soon to be accomplished. A growing envy had subsisted between it and Genoa during the last two centuries; and a new war broke out in 1282. It is difficult to comprehend how two simple cities could put to sea such prodigious fleets as those of Pisa and Genoa. Fleets of thirty, sixty-four, twenty-four, and one hundred and three galleys, were successively put to sea by Pisa, under the command of able generals; but on every occasion the Genoese were able to oppose them with superior fleets. On the 6th of August, 1284, the Pisans were defeated in a naval engagement before the Isle of Meloria; thirty-five of their vessels were lost, five thousand persons perished in battle, and eleven thousand became prisoners of the Genoese. After a few further ineffectual struggles, Pisa lost its standing.

The greatest commercial, and altogether the most remarkable city of the Italian republics, was Venice. Secluded from the world, on a cluster of islands in the Adriatic, the inhabitants of this city had taken up their abode in the course of the fifth century, and they boasted themselves to have been independent of all the revolutions which Europe had been undergoing since the fall of the Roman empire. This might be true to a great extent, though for long it was certainly more the result of their obscurity than their power. By the tenth century, however, the descendants of those fishermen that had first taken refuge here, were able to send fleets abroad which could encounter and overawe both Saracens and Normans. The Venetians had all along kept up a correspondence with Constantinople during the darkest periods of the middle ages. This was greatly renewed and extended about the time of the Crusades. When Constantinople was taken by the Latins (1204), the Venetians, under their doge, or chief magistrate, Henry Dandalo, became possessed of three-eighths of that great city and of the provinces, and Dandalo assumed the singularly accurate title of Duke of three-eighths of the Roman Empire. The Venetians greatly increased their share of the spoil by making advantageous purchases from the more needy of the Crusaders. Among the most important of these was the Isle of Candia, which they retained till the middle of the seventeenth century. The idea of a bank took its rise in this city, and an establishment of that nature, simply for the receipt of deposits, is said to have existed in it so soon as the year 1157. But it was not till about a century later that banking, as the term is now understood, began at all to be practised. The merchants of Lombardy and of the south of France began at that time to remit money by bills of exchange, and to make profit upon loans. The Italian clergy who had benefices beyond the Alps, found the new method of transmitting money exceedingly convenient, and the system of exacting usury or interest, after experiencing every obstruction from ignorance and bigotry, became a legal part of commerce. In the thirteenth century the government of Venice was entirely republican; but continued wars with Genoa reduced both cities. These wars were all conducted on the seas, and the display of naval strength on both sides seems prodigious when we reflect on the poor condition of Italy at the present day. Besides these wars for objects of ambition, there were continual jealousies which rose above enlightened views of self-interest, and led to the most disgraceful broils. At the middle of the fourteenth century, a battle took place between the rival citizens, in which the Genoese were defeated. Their loss was immense, and in distress and in revenge they gave themselves up to John Visconti, Lord of Milan, then the richest and among the most ambitious of the petty tyrants of Italy, hoping that he would give them the means to re-establish their fleet and continue the war with the Venetians. He did so, and in another naval engagement, fought in 1354, in the Gulf of Sapienza, the Venetians were entirely defeated. But the Genoese had sacrificed their liberty in their thirst for revenge. Visconti became their master, instead of friend. Venice was able to rise above its temporary discomfiture, and during the fifteenth century its fame and power became greater than they had ever been before. In the beginning of the fifteenth century the Venetians captured the town of Padua, and gradually lost their empire of the sea, while they acquired possessions on the continent.

Among the most famous of the Italian states at this period was Florence; and its fame was founded, not on arms but on literature. Like the other Italian cities, however, it owed its first elevation to the commercial industry of its inhabitants. There was a curious division of the Florentine citizens, subsisting about the beginning of the thirteenth century, into companies or *arts*. These were at first twelve, seven called the greater arts, and five the lesser; but the latter were gradually increased to fourteen. The seven greater arts were those of lawyers and notaries, of dealers in foreign cloth, called sometimes *calimala*, of bankers or money-changers, of woollen-drapers, of physicians and druggists, of dealers in silk, and of furriers. The inferior arts were those of retailers of cloth, butchers, smiths, shoemakers, and builders. It was in the thirteenth century that Florence became a republic, and it maintained its independence for two hundred years. In the beginning of the fifteenth century, it became peculiarly distinguished by the revival of Grecian literature and the cultivation of the fine arts. Cosmo de Medici, who lived a citizen of Florence at this time, and was known by the name of the Grand

Duke of Tuscany, descended from a long line of ancestors whose wealth had been honourably acquired in the prosecution of the *greater arts*, had more riches than any king in Europe, and laid out more money on works of learning, taste, and charity, than all the princes of his age put together. The same liberality and munificence distinguished his family for several generations.

The commercial success of the states of Italy induced the inhabitants of northern Europe to attempt similar enterprises. In the thirteenth century the sea-ports on the Baltic were trading with France and Britain, and with the Mediterranean. The commercial laws of Oleron and Wisbuy (on the Baltic) regulated for many ages the trade of Europe. To protect their trade from piracy, Lubec, Hamburgh, and most of the northern sea-ports, joined in a confederacy, under certain general regulations, termed the *League of the Hanse Towns;* a union so beneficial in its nature, and so formidable in point of strength, as to have its alliance courted by the predominant powers of Europe. "For the trade of the Hanse towns with the southern kingdoms, Bruges on the coast of Flanders was found a convenient enterpôt, and thither the Mediterranean merchants brought the commodities of India and the Levant, to exchange for the produce and manufactures of the north. The Flemings now began to encourage trade and manufactures, which thence spread to the Brabanters; but their growth being checked by the impolitic sovereigns of those provinces, they found a more favourable field in England, which was destined thence to derive the great source of its national opulence."—(*Tytler.*)

THE TURKS.—FALL OF CONSTANTINOPLE.

We have already seen the weakness of the empire of Constantinople at the time of the Crusades; we have seen the city sacked and the government seized by the champions of the cross. The Greeks regained their empire in the year 1261, but in a mangled and impoverished condition. For nearly two centuries it continued in a similar state. Andronicus, son of Michael Palæologus, who had restored the Greek empire, allowed himself to be persuaded that, as God was his protector, all military force was unnecessary; and the superstitious Greeks, regardless of danger, employed themselves in disputing about the transfiguration of Jesus Christ, when their unfortunate situation made it necessary that they should have been studying the art of war, and training themselves to military discipline.

In the mean time, the Turks had become a powerful people. They had embraced the Mohammedan religion long before the time of the Crusades, and proved powerful obstacles to the success of those expeditions. About the beginning of the fourteenth century, they established an empire of their own in Asia Minor, under Othman or Ottoman, and to this day the Ottoman Empire is a name given to the dominions of their descendants. By degrees they encroached on the borders of the empire of Constantinople, and they were only prevented from subverting it at a much earlier period than they did, by being called upon to defend themselves from the arms of an eastern conqueror who arose at this time. Tamerlane, otherwise called Timerbek, was a prince of the Usbek Tartars, and a descendant from Gengis Khan. After having overrun Persia, and a great part of India and Syria, this great conqueror was invited by some of the minor princes of Asia, who were suffering under the Ottoman tyranny, to come and protect them. Tamerlane was flattered by the request, and having brought a great army into Phrygia, he was there met by Bajazet, the Ottoman emperor, who readily gave battle, and was defeated and made prisoner (1402). Tamerlane made Samarcand the capital of his empire, and there received the homage of all the princes of the east. Illiterate himself, he was solicitous for the cultivation of literature and science in his dominions; and Samarcand became for a while the seat of learning, politeness, and the arts, but was destined to relapse, after a short period, into its ancient barbarism. The Turks, after the death of Tamerlane, resumed their purpose of destroying the empire of the East. The honour, or disgrace, as it may be thought, of effecting this, fell to the lot of Mohammed II., commonly surnamed the Great. At the early age of twenty-one, Mohammed projected this conquest. His countrymen had already passed into Europe; they had possessed themselves of the city of Adrianople, and, indeed, had left nothing of all the empire of the East to the Greeks, but the city of Constantinople itself. The preparations made for defence were not such as became the descendants of Romans, and the powers of Europe now looked upon the East with the most supine indifference. The Turks assailed the city both on the land side and on that of the sea; and, battering down its walls with their cannon, entered sword in hand, and massacred all who opposed them (1453). Mohammed, like many other ambitious conquerors, showed himself unwilling to destroy unnecessarily. The imperial edifices were preserved, and the churches were converted into mosques; the exercise of their religion was freely allowed to the Christians, and this privilege they have never been deprived of. Constantine (for that was the name of the last, as well as the first Emperor of the East) was slain in battle. From the time that it was founded by Constantine the Great, the city had subsisted 1123 years. Mohammed liberally patronized the arts and sciences. He was himself not only a politician, but a scholar, and he invited both artists and men of letters to his capital from the kingdoms of Europe. But the taking of Constantinople had an effect contrary to his wishes; it dispersed the learned Greeks, or Greeks who were *called* learned, all over Europe; and this, among other things, may be looked upon as a help to the great revival of letters which the fifteenth century witnessed. The taking of Constantinople was followed by the conquest of Greece and Epirus; and Italy might probably have met with a similar fate, but for the fleet of the Venetians, who opposed the arms of Mohammed with considerable success, and even attacked him in Greece; but the contending powers soon after put an end to hostilities by a treaty. By this time, Europe was trembling at Mohammed's success, and was afraid, not without reason, that he might pursue his conquests westwards. It was relieved from fear by the death of Mohammed (1481). His descendants have continued to our own day to occupy one of the finest countries in Europe; and it was only in the present age that Greece was liberated from their dominion.

RISE OF CIVIL FREEDOM AND SOCIAL IMPROVEMENT.

Civil freedom, as we have seen, dawned first in the great commercial cities of Italy, whence it spread to Germany, Flanders, and Britain. This important change in society may be traced to the institution of free communities of traders, or guilds of merchants; and such confederacies were a necessary consequence of the usurpation and tyranny of the nobles and feudal possessors of the soil. In the eleventh and twelfth centuries, the usurpations of the nobility became intolerable; they had reduced the great body of the people to a state of actual servitude. Nor was such oppression the portion of those alone who dwelt in the country, and were employed in cultivating the estates of their masters. Cities and villages found it necessary to hold of some great lord, on whom they might depend for protection, and became no less subject to his arbitrary jurisdiction. The inhabitants were deprived of those rights which, in social life, are deemed most natural and inalienable. They could not dispose of the effects which their own industry

had acquired, either by a latter will, or by any deed executed during their lives. Neither could they marry, or carry on lawsuits, without consent of their lord. But as soon as the cities of Italy began to turn their attention towards commerce, and to conceive some idea of the advantages which they might derive from it, they became impatient to shake off the yoke of their insolent lords, and to establish among themselves such a free and equal government as would render property and industry secure. The Italian cities were the first to emancipate themselves, and their example was followed in other great seats of population, the king of the country in general countenancing the establishment of free communities, in order to gain support against the encroachments of the overgrown power of the barons. The first community of this description formed in Scotland is understood to have been that of Berwick-upon-Tweed, which received its charter from William the Lion. Towns, upon acquiring the right of community, became so many little republics, governed by known and equal laws. The inhabitants being trained to arms, and being surrounded by walls, they soon began to hold the neighbouring barons in contempt, and to withstand aggressions on their property and privileges. Another great good, of fully more importance, was produced. These free communities were speedily admitted, by their representatives, into the great council of the nation, whether distinguished by the name of a Parliament, a Diet, the Cortes, or the States-General. This is justly esteemed the greatest event in the history of mankind in modern times. Representatives from the English boroughs were first admitted into the great national council by the barons who took up arms against Henry III. in the year 1265; being summoned in order to add to the greater popularity of their party, and to strengthen the barrier against the encroachments of regal power. Readers may draw their own conclusions from an event which ultimately had the effect of revolutionizing the whole framework of society, and of rearing that great respectable body of the people styled "the middle class."

The enfranchising of burgel communities led to the manumission of slaves. Hitherto the tillers of the ground, all the inferior classes of the country, were the bondsmen of the barons. The monarchs of France, in order to reduce the power of the nobles, set the example, by ordering (1315–18) all serfs to be set at liberty on just and reasonable conditions. The edicts were carried into immediate execution within the royal domain. The example of their sovereigns, together with the expectation of considerable sums which they might raise by this expedient, led many of the nobles to set their dependants at liberty; and servitude was thus gradually abolished in almost every province of the kingdom. This beneficial practice similarly spread over the rest of Europe; and in England, as the spirit of liberty gained ground, the very name and idea of personal servitude, without any formal interposition of the legislature to prohibit it, was totally banished *

While society was assuming the semblance of the form it now bears, the progress of improvement was accelerated by various collateral circumstances, the first of which worth noticing was

The Revival of Letters. The first restorers of learning in Europe were the Arabians, who, in the course of their Asiatic conquests, became acquainted with some of the ancient Greek authors, discovered their merits, and had them translated into Arabic, esteeming those principally which treated of mathematics, physics, and metaphysics. They disseminated their knowledge in the course of their conquests, and founded schools and colleges in all the countries which they subdued. The western kingdoms of Europe became first acquainted with the learning of the ancients through the medium of those Arabean translations. Charlemagne caused them to be retranslated into Latin; and, after the example of the Caliphs, founded universities at Bononia, Pavia, Osnaburg, and Paris. Similar efforts were made in England by Alfred; and to him we owe the establishment, or at least the elevation, of the University of Oxford. The first efforts, however, at literary improvement, were marred by the subtleties of scholastic divinity. Perhaps the greatest and wisest literary character of the middle ages was an English friar, named Roger Bacon. This extraordinary individual was not only learned, but, what was more uncommon in those times, he was scientific. Hallam asserts that he was acquainted with the nature of gunpowder, though he deemed it prudent to conceal his knowledge. He saw the insufficiency of school philosophy, and was the first to insist on experiment and the observation of nature as the fittest instruments by which to acquire knowledge. He reformed the calendar, and made discoveries in astronomy, optics, chemistry, medicine, and mechanics.

It is to Italy, however, that we owe the first and greatest exertions in the revival of letters. The spirit of liberty which had arisen among its republics was favourable to the cultivation of literature; and accordingly we find that not only did they produce many individuals who were most active and successful in bringing to light the relics of classical lore, but that there also arose among them men possessed of the highest order of original genius. Florence produced Dante so early as 1265. Dante was associated with the magistracy of his native city in his earlier years, but, having given dissatisfaction in that capacity, he was banished, and in his exile produced his great poem entitled the Divine Comedy. It is a representation of the three supposed kingdoms of futurity—Hell, Purgatory, and Paradise—divided into one hundred cantos, and containing about 14,000 lines. The poem has been much praised. Petrarch, born in the year 1304, was likewise a Florentine by birth. The misfortunes of his father had impoverished the family, and Petrarch was too proud to take the usual method of retrieving his affairs. His genius, however, earned for him the friendship of many Italian princes, and even of more popes than one, although he had exerted his talents to expose the vices of their courts. Petrarch's personal character seems to have exhibited some unamiable traits; but he has sung of love, friendship, glory, patriotism, and religion, in language of such sweetness and power as to have made him the admiration of every succeeding age. Boccaccio, like the two great poets named, was also a Florentine. He was born in 1313, and his name has descended to posterity less associated with his poetry than the light, elegant, and easy prose of his novels. These were the production of his idle hours; and his Latin works, on which he supposed his fame to rest, have long since been forgotten.

The discovery of Justinian's Laws, as detailed in the Pandects (see HISTORY OF LAWS), was another event which powerfully tended to modify the barbarism that prevailed during the middle ages in Europe.

The invention of the Mariner's Compass must be reckoned of still greater importance, and yet it is absolutely unknown to whom we owe it. That honour has been often bestowed on Gioia, a citizen of Amalphi, who lived about the commencement of the fourteenth century. But the polarity of the magnet at least was known to the Saracens two hundred years before that time; though even after the time of Gioia, it was long before the magnet was made use of as a guide in navigation. "It is a singular circumstance," says Mr. Hallam, "and only to be explained by the obstinacy with which men are apt to reject improvement, that the magnetic needle was not generally adopted in navigation till very long after the discovery of its properties, and even after their peculiar

* Robertson's History of Charles V.

importance had been perceived. The writers of the thirteenth century, who mention the polarity of the needle, mention also its use in navigation; yet Capmany has found no distinct proof of its employment till 1403, and does not believe that it was frequently on board Mediterranean ships at the latter part of the preceding age." The Genoese, however, are known in the fourteenth century to have come out of that inland sea, and steered for Flanders and England. But by far the greatest sailors of the age were the Spaniards and Portuguese. This latter nation had little or no existence during the greater part of the middle ages, but in the twelfth, thirteenth, and fourteenth centuries, they were able to expel the Moors from a great part of their country; and in the beginning of the fifteenth, John, surnamed the Bastard, who was then their king, was the first European prince who exhibited a respectable navy. It was in the year 1486 that this adventurous people first doubled the Cape of Good Hope.

The discovery of America (1493) may be mentioned supplementarily to the invention of the mariner's compass, as an event which, without it, could never have taken place. The immortal honour of that discovery rests with Christopher Columbus, a sailor of Genoa. After unsuccessful applications at almost every court in Europe, and braving obloquy and contempt, Columbus at last obtained a miserable force from Ferdinand and Isabella of Spain, and with no landmarks but the heavens, nor any guide but his compass, he launched boldly into the sea, and at last conducted Europeans to the great western hemisphere. The importance of that discovery, and its effect on the destinies of mankind, are subjects on which it is not our present purpose to dilate.

In the course of the fourteenth and beginning of the fifteenth centuries, various discoveries in the arts were made, which powerfully tended to the advancement of society; among these the more important were the invention of gunpowder and fire-arms, clocks and watches, paper-making, and printing. This last, the greatest of all, prepared the way for the Reformation in religion, in the sixteenth century, by which religious was added to civil freedom, and a great spur given to individual activity.

Important as these events were in their ultimate tendencies, it is to be remembered that they did not immediately make any distinct change in the comforts of the people. In the latter centuries of the middle ages, the amusements of the common people were metrical and prose romances, unintelligible prophecies, and fables of giants and enchanters. The state of England and of France, at this period, shows the small advance which had been made towards those comforts and improvements which now exist. Even in the large cities, the houses were roofed with thatch, and had no chimneys. "The two most essential improvements in architecture during this period," says Mr. Hallam, "one of which had been missed by the sagacity of Greece and Rome, were chimneys and glass windows. Nothing apparently can be more simple than the former; yet the wisdom of ancient times had been content to let the smoke escape by an aperture in the centre of the roof; and a discovery, of which Vitruvius had not a glimpse, was made, perhaps in this country [England], by some forgotten semi-barbarian. About the middle of the fourteenth century, the use of chimneys is distinctly mentioned in England and in Italy; but they are found in several of our castles which bear a much older date. This country seems to have lost very early the art of making glass, which was preserved in France, whence artificers were brought into England to furnish the windows of some new churches, in the seventh century. It is said that, in the reign of Henry III., few ecclesiastical buildings had glazed windows. Suger, however, a century before, had adorned his great work, the abbey of St. Denis, with windows not only glazed but painted; and I presume that other churches of the same class, both in France and England, were generally decorated in a similar manner. Yet glass is said not to have been employed in the domestic architecture of France before the fourteenth century, and its introduction into England was probably by no means earlier. Nor, indeed, did it come into general use during the period of the middle ages. Glazed windows were considered as movable furniture, and probably bore a high price. When the Earls of Northumberland, as late as the reign of Elizabeth, left Alnwick Castle, the windows were taken out of their frames and carefully laid by."

By far the finest specimens of architecture which the middle ages produced, were the religious edifices built in the twelfth and three following centuries. The superstition of the times was favourable to the production of works of that sort. To leave one's means for such a purpose was deemed so meritorious as to entitle the donor to eternal happiness in the next scene of existence; and men in this world thought it a duty to render structures designed for purposes so sacred as beautiful and becoming as they could. It was about the middle of the twelfth century that what has been called the Gothic style of architecture took its rise, of which the peculiar feature is thought to be the pointed arch, formed by the segment of two intersecting semi-circles, struck from points equidistant from the centre of a common diameter. This style of architecture has been said by different individuals to have originated in France, in Germany, in Italy, and in England. The truth is, we neither know where it originated nor from what source it was derived. It has afforded antiquaries a curious subject of speculation how so perfect a system, as this has been thought, should not only have originated but reached perfection in times so dark. Any effectual explanation is probably now impossible; the knowledge of the art was never permitted to go beyond a fraternity of freemasons, and it is not to be supposed that the early archives of that mysterious association have survived so many revolutions.

The living even of the highest nobility under the Edwards was such as would not prove very palatable to their luxurious descendants. They drank little wine, had no foreign luxuries, rarely kept male servants except for husbandry, and still more rarely travelled beyond their native country. An income of £10 or £20 was reckoned a competent estate for a gentleman—at least the lord of a single manor would seldom have enjoyed more. A knight who possessed £150 a year passed for extremely rich. Sir John Fortescue speaks of five pounds a year as "a fair living for a yeoman;" and we read that the same sum (£5) served as the annual expense of a scholar attending the university. Modern lawyers must be surprised at the following, which Mr. Hallam extracts from the churchwarden's accounts of St. Margaret, Westminster, for 1476:—"Also paid to Roger Flypott, learned in the law, for his counsel giving 3s. 8d., *with fourpence for his dinner*."

It has been remarked, that the wages of day-labourers, particularly those engaged in agriculture, were better in the times of Edward III. and Henry IV. than they have ever been at any other period of English history; nor can it be denied that this, upon the whole, is true. In the fourteenth century, a harvest man had fourpence a day, which enabled him in a week to buy a comb of wheat; but, says Sir John Cullum, in his History of Hawsted, to buy a comb of wheat, a man must now (1784) work ten or twelve days. "So," says Mr. Hallam, "under Henry VI., if meat was at a farthing and a half the pound, which, I suppose, was about the mark, a labourer earning threepence a day, or eighteenpence in the week, could buy a bushel of wheat, at six shillings the quarter, and twenty-four pounds of meat, for his family. A labourer at present earning twelve shillings a week, can only buy a bushel of wheat at eighty shil

ings the quarter, and twelve pounds of meat at sevenpence." It is thus undeniable that the day-labourers' wages could purchase greater quantities of certain kinds of food than the wages given to the same class of persons could do in the present day, but they wanted a thousand comforts which the meanest of our workmen now enjoy; and few surely would be willing to exchange all these blessings for the wars and miseries which Edward caused, even although they were ensured, along with them, of daily supplies of beef and ale, of which the ancient yeomen boasted.

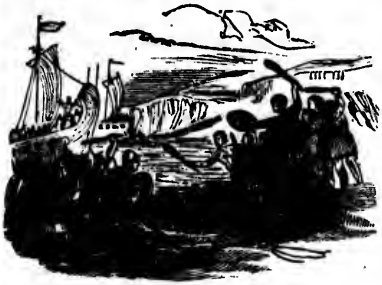
The internal accommodation of houses was even less than their outward splendour. A gentleman's house containing three or four beds was thought to be extraordinarily well provided; few probably had more than two. The walls were commonly bare, without wainscot or even plaster, except that some great houses were furnished with hangings, and that, perhaps, hardly so soon as the reign of Edward VI. Neither books nor pictures could find a place in such dwellings as these. Some inventories of furniture, bearing dates in the fourteenth century, have been preserved to our own day, and they are curious and amusing. In Sir F. Eden's work on the State of the Poor, a carpenter's stock is said to have been valued, in the year 1301, at a shilling! In an inventory of the goods of "John Port, late the king's servant," who died about 1524, we find that this gentleman's house had consisted of a hall, parlour, buttery, and kitchen, with five bedsteads, two chambers, three garrets, and some minor accommodations. From this it may be inferred that Mr. Port was a rather important man in his day, for very few individuals at that time could boast of such accommodation. His plate was valued at £94, his jewels at £23; and his funeral expenses amounted to £73, 6s. 8d.

Of all the arts necessary to existence, perhaps that of agriculture was in the most miserable condition during the middle ages. On a thousand spots of land which we now behold subjected to a fruitful cultivation, there was nothing to be seen at that time but "tracts of forest ground, stagnating with bog or darkened by native woods, where the wild-ox, the roe, the stag, and the wolf, had scarcely learned the supremacy of man." We owe the first efforts at improvement in agriculture over the greater part of Europe to the monks. They chose, for the sake of retirement, secluded regions, which they cultivated with the labour of their hands. "Of the Anglo-Saxon husbandry we may remark," says Mr. Turner, "that Doom's-day Survey gives us some indication that the cultivation of the church lands was much superior to that of any other. They had much less wood upon them, and their meadow was more abundant and in more numerous distributions." The culture of arable land in general was very imperfect; according to Sir John Cullum, a full average crop on an acre sown with wheat amounted only to about nine or ten bushels—a circumstance, the knowledge of which may save us any surprise at a calculation by which it appears that, in the thirteenth century, the average annual rent of an acre of arable land was from sixpence to a shilling. In the time of Edward I., the ordinary price of a quarter of wheat appears to have been about four shillings. A sheep was sold high at a shilling, and an ox might be reckoned at ten or twelve. In considering these statements, however, of positive money values, it must be recollected by persons of this day, that the precious metals were depreciated progressively in their value by every sovereign in Europe, who enabled themselves in this way to pay debts *in appearance*, while in reality they were cheating their creditors to that extent; and sums of small name in those days were every way equal in value to greater sums in our own.

At this time wine was sold only in the shops of the English apothecaries. Yet the progress of luxury, as it was called, had already begun to excite serious alarm. The Parliament of Edward III. passed an act prohibiting the use of gold and silver in apparel to all who had not a hundred pounds a year; and Charles VI. of France ordained that none should presume to entertain their guests with more than two dishes and a mess of soup. It is almost unnecessary to add, that laws of that sort were passed only with a view to persons in the highest ranks; for others they were not needed. Contemporary history has recorded nothing of the poorer classes but their slaughter in war; but we are at little loss to perceive, that domestic comfort must have been few and slender among them, when we know that neither chairs nor looking-glasses could be found in the bedrooms of the nobility. Ages over which this sketch does not extend, were required before the great mass of human beings should become possessed of personal comforts or of political rights.

HISTORY OF GREAT BRITAIN AND IRELAND.

FROM THE CONQUEST BY THE ROMANS TILL THE YEAR 1645.



CONQUEST BY THE ROMANS.

Previously to the year 55 before Christ, the British Islands, in common with the whole of northern and western Europe, were occupied by barbarous tribes, who bore nearly the same relation to the civilized nations of Greece and Italy, which the North American Indians of the present day bear to the inhabitants of Great Britain and the United States. The Romans, who for ages had been extending their power over their rude neighbours, had concluded the conquest of Gaul, now called France, when, in the year just mentioned, their celebrated commander, Julius Cæsar, learning from the merchants of that country that there was another fertile land on the opposite side of the narrow sea now termed the British Channel, resolved to proceed thither, and subject it also to the Roman arms. Disembarking at the place since called Deal, he soon overawed the savage natives, though they were naturally warlike, and averse to a foreign yoke. He did not, however, gain a firm footing in Britain till the succeeding year (54 before Christ), when he employed no fewer than 800 vessels to convey his troops from Gaul. Except on the coasts, where some tillage prevailed, the British tribes lived exactly as the Indians now do, upon animals caught in hunting, and fruits which grew spontaneously. They stained and tattooed their bodies, and had no religion but a bloody idolatry called Druidism. The people of Ireland were in much the same condition.

Little was done on this occasion to establish the Roman power in Britain; but about a century afterwards, namely, in the year of Christ 43, when the Emperor Claudius was reigning at Rome, another large army invaded the island, and reduced a considerable part of it. A British prince called Caradoc, or Caractacus, who had made a noble defence against their arms, was finally taken and sent prisoner to Rome, where he was regarded with the same wonder as we should bestow upon a North American chief who had greatly obstructed the progress of our settlements in that quarter of the world. In the year 61, an officer named Suetonius did much to reduce the Britons, by destroying the numerous Druidical temples in the Isle of Anglesea; religion having, in this case as in many others since, been a great support to the patriotic cause. He soon after overthrew the celebrated British princess Boadicea, who had raised an almost general insurrection against the Roman power.

In the year 79, Agricola, a still greater general, extended the influence of Rome to the Firths of Forth and Clyde, which he formed into a frontier, by connecting them with a chain of forts. It was his policy, after he had subdued part of the country, to render it permanently attached to Rome, by introducing the pleasures and luxuries of the capital. He was the first to sail round the island. In the year 84, having gone beyond the Forth, he was opposed by a great concourse of the rude inhabitants of the north, under a chief named Galgacus, whom he completely overthrew at *Mons Grampius*, or the Grampian Mountain.

It is generally allowed that the Romans experienced an unusual degree of difficulty in subduing the Britons; and it is certain that they were baffled in all their attempts upon the northern part of Scotland, which was then called Caledonia. The utmost they could do with the inhabitants of that country, was to build walls across the island to keep them by themselves. The first wall was built in the year 121, by the Emperor Hadrian, between Newcastle and the Solway Firth. The second was built by the Emperor Antoninus, about the year 140, as a connection of the line of forts which Agricola had formed between the Firths of Forth and Clyde. When the conquest was thus so far completed, the country was governed in the usual manner of a Roman province; and towns began to rise in the course of time, being generally those whose names are now found to end in *chester*, a word derived from *castra*, the Latin word for a camp. The Christian religion was also introduced, and Roman literature made some progress in the country.

CONQUEST BY THE SAXONS.

At length a time came when the Romans could no longer defend their own proper country against the nations in the north of Europe. The soldiers were then withdrawn from Britain (about the year 440), and the people left to govern themselves. The Caledonians, who did not like to be so much straitened in the north, took advantage of the unprotected state of the Britons to pour in upon them from the other side of the wall, and despoil them of their lives and goods. The British had no resource but to call in another set of protectors, the Saxons, a warlike people who lived in the north of Germany and the Jutes and Angles, who inhabited Denmark. The remedy was found hardly any better than the disease. Having once acquired a footing in the island, these hardy strangers proceeded to make it a subject of conquest, as the Romans had done before, with this material difference, that they drove the British to the western parts of the island, particularly into Wales, and settled, with new hordes of their countrymen, over the better part of the land. So completely was the population changed, that, excepting in the names of some of the hills and rivers, the British language was extinguished, and even the name of the country itself was changed from what it originally was, to Angle-land, or England, a term taken from the Angles. The conquest required about a hundred and fifty years to be effected, and, like that of the Romans, it extended no farther north than the Firths of Forth and Clyde. Before the Britons were finally cooped up in Wales, many battles were fought: but few of these are accurately recorded. The most distinguished of the British generals were the Princes Vortimer and Aurelius Ambrosius: it is probably on the achievements of the latter that the well-known fables of Arthur and his knights are founded.

England, exclusive of the western regions, was now

divided into seven kingdoms, called Kent, Northumberland, East Anglia, Mercia, Essex, Sussex, and Wessex, each of which was governed by a race descended from the leader who had first subdued it; and the whole have since been called by historians the *Saxon Heptarchy*, the latter word being composed of two Greek words, signifying *seven kingdoms*. To the north of the Forth dwelt a nation called the Picts, who also had a king, and were, in all probability, the people with whom Agricola had fought under the name of Caledonians. In the Western Highlands there was another nation, known by the name of the Scots, or Dalriads, who had gradually migrated thither from Ireland, between the middle of the third century and the year 503, when they established, under a chief named Fergus, a monarchy destined in time to absorb all the rest. About the year 700, there were no fewer than fifteen kings, or chiefs, within the island, while Ireland was nearly in the same situation. In Britain, at the same time, five languages were in use, the Latin, Saxon, Welsh (or British), the Pictish, and the Irish. The general power of the country has been found to increase as these nations and principalities were gradually amassed together.

Although three of the Saxon kingdoms, Wessex, Mercia, and Northumberland, became predominant, the Heptarchy prevailed from about the year 585 to 800, when Egbert, King of Wessex, acquired a paramount influence over all the other states, though their kings still continued to reign. Alfred, so celebrated for his virtues, was the grandson of Egbert, and began to reign in the year 871. At this time, the Danes, who are now a quiet, inoffensive people, were a nation of pirates, and at the same time heathens. They used to come in large fleets, and commit dreadful ravages on the shores of Britain. For some time, they completely overturned the sovereignty of Alfred, and compelled him to live in obscurity in the centre of a marsh. But he at length fell upon them, when they thought themselves in no danger, and regained the greater part of his kingdom. Alfred spent the rest of his life in literary study, of which he was very fond, and in forming laws and regulations for the good of his people. He was perhaps the most able, most virtuous, and most popular prince that ever reigned in Britain; and all this is the more surprising, when we find that his predecessors and successors, for many ages, were extremely cruel and ignorant. He died in the year 901, in the fifty-third year of his age.

CONQUEST BY THE NORMANS.

The Saxon line of princes continued to reign, with the exception of three Danish reigns, till the year 1066, when the crown was in the possession of a usurper named Harold. The country was then invaded by William, Duke of Normandy, a man of illegitimate birth, attended by a large and powerful army. Harold opposed him at Hastings (October 14), and, after a well-contested battle, his army was defeated, and himself slain. William then caused himself to be crowned king at Westminster; and in the course of a few years he succeeded, by means of his warlike Norman followers, in completely subduing the Saxons. His chiefs were settled upon the lands of those who opposed him, and became the ancestors of the present nobility of England.

Previously to this period, the church of Rome, which was the only surviving part of the power of that empire, had established its supremacy over England. The land was also subjected to what is called the feudal system, by which all proprietors of land were supposed to hold it from the king for military service, while their tenants were understood to owe them military service, in turn, for their use of the land. All orders of men were thus kept in a chain of servile obedience, while some of the lower orders were actually slaves to their superiors.

In the year 853, Kenneth, King of the Scots, had added the Pictish kingdom to his own, and his descendant Malcolm II., in 1020, extended his dominions over not only the south of Scotland, but a part of the north of England. Thus, putting aside Wales, which continued to be an independent country, under its own princes, the island was divided at the time of the Norman Conquest, into two considerable kingdoms, England and Scotland, as they were for some centuries afterwards. Ireland, which had also been invaded by hordes from the north of Europe, was divided into a number of small kingdoms, like England under the Heptarchy.

EARLY NORMAN KINGS.

William, surnamed *The Conqueror*, reigned from 1066 to 1087, being chiefly engaged all that time in completing the subjugation of the Saxons. He is allowed to have been a man of much sagacity, and a firm ruler; but his temper was violent, and his dispositions brutal. At the time of his death, which took place in Normandy, his eldest son Robert happening to be at a greater distance from London than William, who was the second son, the latter individual seized upon the crown, of which he could not afterwards be dispossessed, till he was shot accidentally by an arrow in the New Forest, in the year 1100. Towards the close of this king's reign, the whole of Christian Europe was agitated by the first crusade—an expedition for the recovery of the Holy Land from the Saracens. Robert of Normandy had a high command in this enterprise, and gained much fame as a warrior; but while he was in Italy, on his return, his younger brother Henry usurped the throne left vacant by William, so that he was again disappointed of his birthright.

Henry I.—surnamed *Beauclerk*, from his being a fine scholar—was a prince of some ability; but he disgraced himself by putting out the eyes of his eldest brother, and keeping him nearly thirty years in confinement. Such barbarous conduct shows that, in this age, might was the only right, and that men hesitated at no actions which might promise to advance their own interests.

Contemporary with William the Conqueror in England, was Malcolm III. in Scotland, surnamed *Canmore*, from his having a large head. This prince, after overthrowing the celebrated usurper Macbeth, married Margaret, a fugitive Saxon princess, through whom his posterity became the heirs of that race of English sovereigns. He was a good prince, and, by settling Saxon refugees upon his lowland territory, did much to improve the character of the Scottish nation, who are described as having been, before this time, a nation in which there was no admixture of civilization. At Malcolm's death, in 1093, the crown was contested for a while by a usurper called Donald Bane, and the elder sons of the late monarch, but finally fell to the peaceable possession of his youngest son David I., who was a prince of much superior character, apparently, to the Norman sovereigns who lived in the same age. The Church of Rome having now gained an ascendency in Scotland, David founded a considerable number of monasteries and churches for the reception of the ministers of that religion. All the most celebrated abbacies in Scotland took their rise in his time.

Henry Beauclerk of England, in order to strengthen his claim by a Saxon alliance, married Maud, the daughter of Malcolm Canmore and of the Princess Margaret. By her he had an only daughter of the same name, whom he married first to the Emperor of Germany, and then to Geoffrey Plantagenet, eldest son of the Earl of Anjou, in France. This lady, and her children by Plantagenet, were properly the heirs of the English crown; but on the death of Henry, in 1135, it was seized by a usurper named Stephen, a distant member of the conqueror's family, who reigned for nine

teen years, during which the country was rendered almost desolate by civil wars, in which David of Scotland occasionally joined.

On the death of Stephen, in 1154, the crown fell peacefully to HENRY II., who was the eldest son of Maud, and the first of the Plantagenet race of sovereigns. Henry was an acute and politic prince, though not in any respect more amiable than his predecessors. His reign was principally marked by a series of measures for reducing the power of the Romish clergy, in the course of which, some of his courtiers, in 1171, thought they could not do him a better service than to murder Thomas-à-Becket, Archbishop of Canterbury, who had been the chief obstacle to his views, and was one of the ablest and most ambitious men ever produced in England. For his concern in this foul transaction, Henry had to perform a humiliating penance, receiving eighty lashes on his bare back from the monks of Canterbury. We are the less inclined to wonder at this circumstance, when we consider, that, about this time, the Pope had power to cause two kings to perform the menial service of leading his horse.

Henry was the most powerful king that had yet reigned in Britain. Besides the great hereditary domains which he possessed in France, and for which he did homage to the king of that country, he exacted a temporary homage from William of Scotland, the grandson of David, a monarch of great valour, who took the surname of *the Lion*, and who reigned from 1166 to 1214. Henry also added Ireland to his dominions. This island had previously been divided into five kingdoms—Munster, Leinster, Meath, Ulster, and Connaught. The people, being quite uncivilized, were perpetually quarrelling among themselves; and this, with their heathen religion, furnished a flimsy pretext for invading them from England. Dermot Macmorrough, King of Leinster, having been dethroned by his subjects, introduced an English warrior, Richard Earl of Strigul, generally called *Strongbow*, for the purpose of regaining his possessions. A body composed of fifty knights, ninety esquires, and four hundred and sixty archers, in all six hundred men, was enabled by its superior discipline to overthrow the whole warlike force that could be brought against them; and the conquest was easily completed by Henry in person, who went thither in 1172. The military leaders were left to rule over the country, and they managed their trust so ill, that the Irish never became peaceable subjects of the Norman king, as the English had gradually done.

RICHARD CŒUR DE LION.—JOHN.—MAGNA CHARTA.

Henry II. was much troubled in his latter years by the disobedience of his children. At his death, in 1189, he was succeeded by his son RICHARD, styled *Cœur de Lion*, or the *Lion-hearted*, from his headstrong courage, and who was much liked by his subjects on that account, though it does not appear that he possessed any other good qualities. At the coronation of Richard, the people were permitted to massacre many thousands of unoffending Jews throughout the kingdom. Almost immediately after his accession, he joined the King of France in a second crusade; landed in Palestine (1191), and fought with prodigious valour, but with no good result. On one occasion, being offended at a breach of truce by his opponent Saladin, he beheaded 5000 prisoners; whose deaths were immediately revenged by a similar massacre of Christian prisoners. In 1192, he returned with a small remnant of his gallant army, and, being shipwrecked at Aquileia, wandered in disguise into the dominions of his mortal enemy the Duke of Austria, who, with the Emperor of Germany, detained him till he was redeemed by a ransom, which impoverished nearly the whole of his subjects. This prince spent the rest of his life in unavailing wars with Philip of France, and was killed at the siege of a castle in Limousin, in 1199, after a reign of ten years, of which he had spent only about three months in England.

JOHN, the younger brother of Richard, succeeded, although Arthur, Duke of Bretagne, the son of an intermediate brother, was the proper heir. John, who was at once vain, cruel, and weak alienated the affections of his subjects almost at the very first by the assassination of his nephew, which he is said to have performed with his own hands. The weakness of kings is often the means of giving increased liberties and privileges to the people. The paltry tyranny and wickedness of John caused his barons to rise against him, and the result was, that, on the 19th June, 1215, he was compelled by them to sign what is called the *Magna Charta*, or Great Charter, granting them many privileges and exemptions, and generally securing the personal liberty of his subjects. The principal point concerning the nation at large, was that no tax or supply should be levied from them without their own consent in a Great Council—the first idea of a Parliament. Some excellent provisions were also made regarding courts of law and justice, so as to secure all but the guilty.

The Pope, it appears, regarded the Magna Charta as a shameful violation of the royal prerogative, and excommunicated its authors, as being worse, he said, than infidels. The opinion of a modern historian is very different. He says, "To have produced the Great Charter, to have preserved it, to have matured it, constitute the immortal claim of England on the esteem of mankind."

HENRY III.—ORIGIN OF PARLIAMENT.

John, at his death in 1216, was succeeded by his son, HENRY III., a weak and worthless prince, who ascended the throne in his boyhood, and reigned fifty-six years, without having performed one worthy act of sufficient consequence to be detailed. In his reign was held the first assemblage approaching to the character of a Parliament. It was first called in 1225, in order to give supplies for carrying on a war against France. The money was only granted on condition that the Great Charter should be confirmed; and thus the example was set at the very first, for rendering supplies a check upon the prerogative of the king, and gradually reducing that power to its present comparatively moderate level. Under the earlier Norman kings, and even, it is believed, under the Saxons, an assembly called the Great Council had shared with the sovereign the power of framing laws; but it was only now that the body had any power to balance that of the king, and it was not till 1265 that representatives from the inhabitants of towns were introduced.

EDWARD I. AND II.—ATTEMPTED CONQUEST OF SCOTLAND

Henry III., at his death in 1272, was succeeded by his son EDWARD I., a prince as warlike and sagacious as his father was the reverse. He distinguished himself by his attempts to add Wales to his kingdom, an object which he accomplished in 1282, by the overthrow and murder of Llewellen, the last prince of that country. In the mean time, from the death of William the Lion in 1214, Scotland had been ruled by two princes, ALEXANDER II. and III., under whom it advanced considerably in wealth, civilization, and comfort. On the death of Alexander III., in 1285, the crown fell to his granddaughter MARGARET, a young girl, whose father was Eric, King of Norway. Edward formed a treaty with the Estates of Scotland for a marriage between this princess and his son, whom he styled Prince of Wales. Unfortunately, the young lady died on her voyage to Scotland; and the crown was left to be disputed by a multitude of distant relations, of whom JOHN BALIOL

and ROBERT BRUCE seemed to have the best right. Edward, being resolved to make Scotland his own at all hazards, interfered in this dispute, and being appointed arbitrator among the competitors, persuaded them to own, in the first place, an ill-defined claim put forward by himself of the right of paramountcy or superior sovereignty over Scotland. When this was done, he appointed Baliol to be his vassal king, an honour which the unfortunate man was not long permitted to enjoy. Having driven Baliol to resistance, he invaded the country, overthrew his army, and, stripping him of his sovereignty, assumed to himself the dominion of Scotland, as a right forfeited to him by the rebellion of his vassal. After he had retired, a brave Scottish gentleman, named William Wallace, raised an insurrection against his officers, and, defeating his army at Stirling, in 1298, cleared the whole country of its southern invaders. But in the succeeding year, this noble patriot was defeated by Edward in person at Falkirk, and the English yoke was again imposed. It is to be remarked, that this could have hardly taken place if the common people, who rose with Wallace, and who were wholly of Celtic and Saxon race, had been led and encouraged by the nobility. The grandees of Scotland, and even the competitors for the crown, being recent Norman settlers, were disposed to pay obedience to the English sovereign.

Some time after the death of Wallace, while Edward was engrossed with his French wars, ROBERT BRUCE, Earl of Carrick, grandson of him who had competed with Baliol, conceived the idea of putting himself at the head of the Scots, and endeavouring, by their means, at once to gain the crown, and to recover the independence of the kingdom. After a series of adventures, among which was the unpremeditated murder of a rival named Comyn, Bruce caused himself, in 1306, to be crowned at Scone. For some time after he had to skulk as a fugitive, being unable to maintain his ground against the English officers; but at length he became so formidable, that Edward found it necessary (1307) to lead a large army against him. The English monarch, worn out with fatigue and age, died on the coast of the Solway Firth, when just within sight of Scotland, leaving his sceptre to his son EDWARD II. That weak and foolish prince immediately returned to London, leaving Bruce to contest with his inferior officers.

After several years of constant skirmishing, during which the Scottish king was able to maintain his ground, Edward resolved to make one decisive effort to reduce Scotland to subjection. In the summer 1314, he invaded it with an army of 100,000 men. Bruce drew up his troops, which were only 30,000 in number, at Bannockburn, near Stirling. Partly by steady valour, and partly by the use of stratagems, the Scots were victorious, and Edward fled ignominiously from the field. The Scottish king gained an immense booty, besides securing his crown and the independence of his country. He soon after sent his brother Edward, with a body of troops, to Ireland, to assist the native chiefs in resisting the English. This bold young knight was crowned King of Ireland, and for some time held his ground against the English, but was at length defeated and slain.

The weakness of Edward II. was chiefly shown in a fondness for favourites, into whose hands he committed the whole interests of his people. The first was a low Frenchman, named Piers Gaveston, who soon fell a victim to the indignation of the barons. The second, Hugh Spencer, misgoverned the country for several years, till at length the Queen and Prince of Wales raised an insurrection against the king, and caused him to be deposed, as quite unfit to reign. The Prince was then crowned as EDWARD III. (1327), being as yet only about fourteen years of age; and, in the course of a few months, the degraded monarch was cruelly murdered in Berkeley Castle.

During the minority of the young king, the reins of government were held by his mother and the Earl of March. Under their administration, a peace was concluded with King Robert of Scotland, of which one of the conditions was a full acknowledgment of the independence of the Scottish monarchy, which had been a matter of dispute for some ages.

EDWARD III.—RICHARD II.

Edward III., who soon after assumed full power, was destined to make good the remark prevalent at this time, that the kings of England were alternately able and imbecile. He was a warlike and sagacious monarch, and inspired by all his grandfather's desire of conquest. In 1329, Robert Bruce died, and was succeeded by his infant son DAVID II., to whom a young sister of the English king was married, in terms of the late treaty. Notwithstanding this connection, Edward aided a son of John Baliol in an attempt to gain the Scottish crown. Edward Baliol overthrew the Regent of Scotland at Duplin, September, 1332, and for two months reigned as King of Scots, while David and his wife took refuge in France. Though now expelled, Baliol afterwards returned to renew his claims, and for many years the country was harassed by unceasing wars, in which the English took a leading part.

But for his attention being diverted to France, Edward III. would have made a more formidable effort to subdue Scotland, and might have succeeded. He was led into a long course of warfare with France, in consequence of an absurd pretension which he made to its crown. In the victories which he gained at Cressy (August 26, 1346) and Poitiers (September 17, 1356) the national valour, his own, and that of his celebrated son, the Black Prince, were shown conspicuously; but this lavish expenditure of the resources of his kingdom, in which he was supported by his parliament, was of no permanent benefit, even to himself, for whom alone it was made. In those days, almost all men fought well, but very few had the art to improve their victories. John, King of France, who had been made captive at Poitiers, and David, King of Scotland, who had been taken in 1346, while conducting an invasion of England, were at one time prisoners in England; but no permanent advantage was ever gained over either of the states thus deprived of their sovereigns. In 1361, after about twenty years of active fighting, the English king left France with little more territory than he had previously enjoyed. Edward had invaded Scotland with a powerful army in 1356, but without making any impression. The Scots, under David's nephew, Robert Stewart, effectually protected themselves, not only from his arms, but from a proposal which David himself basely undertook to make, that Lionel, the third son of the English king, should be acknowledged as his successor. Edward died in 1377, a year after the decease of his son the Black Prince; and notwithstanding all their brilliant exploits, the English territories in France were less than at the beginning of the reign.

England was at this time affected more than at any other by the fashions of chivalry. This was a military enthusiasm, which for some centuries pervaded all Christian Europe. It prompted, as one of its first principles, a heedless bravery in encountering all kinds of danger. Its votaries were expected to be particularly bold in behalf of the fair sex, insomuch that a young knight would sometimes challenge to mortal combat any one who denied his mistress to be the loveliest in the world. Tournaments were held, at which knights clad in complete armour would ride against each other at full speed with levelled lances, merely to try which had the greatest strength and skill; and many were killed or

these occasions. It was a system full of extravagance, and tending to bloodshed; but, nevertheless, it maintained a courtesy towards females, and a romantic principle of honour, which we may be glad to admire, considering how rude was almost every other feature of the age.

Edward III. was succeeded by his grandson, RICHARD II., then a boy of eleven years of age, and who proved to be a person of weak and profligate character. The Commons took advantage of the irregularity of his government to strengthen their privileges, which they had with difficulty sustained during the more powerful rule of his predecessor. Early in this reign they assumed the right, not only of taxing the country, but of seeing how the money was spent. Indignant at the severity of a tax imposed upon all grown-up persons, the peasantry of the eastern parts of England rose, in 1381, under a person of their own order, named Wat Tyler, and advanced, to the number of 60,000, to London, where they put to death the chancellor and primate, as evil counsellors of their sovereign. They demanded the abolition of bondage, the liberty of buying and selling in fairs and markets, a general pardon, and the reduction of the rent of land to an equal rate. The king came to confer with them at Smithfield, where, on some slight pretence, Walworth, mayor of London, stabbed Wat Tyler with a dagger—a weapon which has since figured in the armorial bearings of the metropolis. The peasants were dismayed, and submitted, and no fewer than fifteen hundred of them were hanged. Wat Tyler's insurrection certainly proceeded upon a glimmering sense of those equal rights of mankind which have since been generally acknowledged; and it is remarkable, that at the same time the doctrines of the reformer Wickliffe were first heard of. This learned ecclesiastic wrote against the power of the Pope, and some of the most important points of the Romish faith, and also executed a translation of the Bible into English. His writings are acknowledged to have been of material, though not immediate, effect in bringing about the reformation of religion.

The country was misgoverned by Richard II. till 1399, when he was deposed by his subjects under the leading of his cousin, Henry, Duke of Lancaster. This person, though some nearer the throne were alive, was crowned as HENRY IV., and his predecessor, Richard, was soon after murdered. In the mean time, David of Scotland died in 1371, and was succeeded by Robert Stewart, who was the first monarch of that family. Robert I., dying in 1389, was succeeded by his son Robert II., who was a good and gentle prince. He had two sons, David and James: the former was starved to death by his uncle, the Duke of Albany; and the second, when on his way to France for his education, was seized by Henry IV. of England, and kept captive in that country for eighteen years. Robert II. then died of a broken heart (1406), and the kingdom fell into the hands of the Duke of Albany, at whose death, in 1419, it was governed by his son, Duke Murdock, a very imbecile personage.

HOUSE OF LANCASTER.

Henry IV. proved a prudent prince, and comparatively a good ruler. The settlement of the crown upon him by parliament was a good precedent, though, perhaps, only dictated under the influence of his successful arms. He was much troubled by insurrections, particularly a formidable one by Percy, Earl of Northumberland—and one still more difficult to put down, in Wales, where Owen Glendower, a descendant of the British princes, kept his ground for several years.

On the death of Henry IV. in 1413, he was succeeded by his son, who was proclaimed under the title of HENRY V. The young king attained high popularity, on account of his impartial administration of justice, and his zeal to protect the poor from the oppressions of their superiors. His reign is less agreeably marked by the persecutions of the Lollards, a body of religious reformers, many of whom were condemned to the flames. Being determined to use every endeavour to gain the crown of France, which he considered his by right of birth, he landed in Normandy with 30,000 men (August 1415), and gave battle to a much superior force of the French at Agincourt. He gained a complete victory, which was sullied by his afterwards ordering a massacre of his prisoners, under the apprehension that an attempt was to be made to rescue them. The war was carried on for some years longer, and Henry would have probably succeeded in making good his claim to the French crown, if he had not died prematurely of a dysentery (August 31, 1422,) in the thirty-fourth year of his age, leaving the throne to an infant nine months old, who was proclaimed as HENRY VI., King of France and England.

Under Henry VI., whose power was for some time in the hands of his uncle the Duke of Bedford, the English maintained their footing in France for several years, and at the battle of Verneuil, in 1424, rivalled the glory of Cressy and Poitiers. At that conflict, a body of Scotch, 7000 strong, who had proved of material service to the French, were nearly cut off. In 1428, when France seemed completely sunk beneath the English rule, the interests of the native prince were suddenly revived by a simple maiden named Joan of Arc, who pretended to have been commissioned by Heaven to save her country, and entering into the French army, was the cause of several signal reverses to the English. By her enthusiastic exertions, and the trust everywhere reposed in her supernatural character, Charles VII. was crowned at Rheims, in 1430. Being soon after taken prisoner, the heroic maiden was, by the English, condemned for witchcraft, and burnt. Nevertheless, about the year 1453, the French monarch had retrieved the whole of his dominions from the English, except Calais.

Henry VI. was remarkable for the extreme weakness of his character. His cousin, Richard, Duke of York, descended from an elder son of Edward III., and therefore possessed of a superior title to the throne, conceived that Henry's imbecility afforded a good opportunity for asserting what he thought his birthright. Thus commenced the famous *Wars of the Roses*, as they were called, from the badges of the families of York and Lancaster, the former of which was a red, while the latter was a white rose. In 1454, the duke gained a decisive victory over the forces of Henry, which were led by his spirited consort, Margaret of Anjou. In some succeeding engagements, the friends of Henry were victorious; and at length, in the battle of Wakefield (December 24, 1460), the forces of the Duke of York were signally defeated, and himself, with one of his sons, taken and put to death. His pretensions were then taken up by his eldest son, Edward, who, with the assistance of the Earl of Warwick, gained such advantages next year, that he assumed the crown. Before this was accomplished, many thousands had fallen on both sides. Henry, who cared little for the pomp of sovereignty, was confined in the Tower.

Scotland, in the mean time (1424), had redeemed her king from his captivity in England; and that prince, styled JAMES I., had proved a great legislator and reformer, not to speak of his personal accomplishments in music and literature, which surpassed those of every contemporary monarch. James did much to reduce the Highlands to an obedience under the Scottish government, and also to break up the enormous power of the nobles. By these proceedings, however, he excited a deep hatred in the bosoms of some of his subjects; and, in 1437, he fell a victim to assassination at Perth. He was succeeded by his infant son JAMES II., the greater

part of whose reign was spent in a harassing contention with the powerful house of Douglas, and who was finally killed in the flower of his age, by the bursting of a cannon before Roxburgh Castle. His successor, James III., was also a minor, and, on reaching man's estate, proved to be a weak though not ill-meaning prince. He fell a victim, in 1488, to a conspiracy formed by his subjects, and which was led by his eldest son. The morality of princes in this age seems to have been much upon a par with that ascribed to the Turkish sovereigns of a later period. They never scrupled to destroy life, either within the circle of their own family, or out of it, when it suited their interests to do so.

HOUSE OF YORK.

Edward, of the House of York, styled Edward IV., who commenced his reign in the nineteenth year of his age, reigned ten years, perpetually disturbed by renewed attempts of the Lancastrian party, of which he mercilessly sacrificed many thousands who fell into his hands. At length, having offended the Earl of Warwick, who had been chiefly instrumental in placing him upon the throne, that powerful nobleman raised an insurrection against him, and in eleven days was master of the kingdom, while Edward had to take refuge on the Continent. Henry VI. was then restored, and Warwick acquired the title of King-maker. Nine months after (1471), Edward landed with a small body of followers, and, having rallied his partisans around him, overthrew and killed Warwick at St. Alban's. Margaret of Anjou, who had fought battles for her husband in almost every province of England, gathered a new army, and opposed Edward at Tewkesbury Park, where she was completely defeated. Her son and husband, being taken, were murdered in cold blood, and she herself spent the remainder of her singular life in France. Edward reigned, a profligate and a tyrant, till 1483, when he died in the forty-second year of his age. He had previously caused his brother, the equally profligate Duke of Clarence, to be drowned in a butt of malmsey wine.

During the reign of Edward IV., the plague frequently broke out in England, and carried off immense numbers of the people. It was particularly fatal in London, and in all other places where many houses were huddled closely together, with imperfect means of cleaning and ventilation. It was calculated that the disease, on one occasion in this reign, destroyed as many lives as in fifteen years' war. The plague did not cease to occur in England, or in any other European country, until considerable improvements had taken place in the habits of the people, especially in point of cleanliness.

Edward V., the eldest son of Edward IV., was a boy of eleven years when he succeeded to the crown. His uncle, Richard, Duke of Gloucester, a wicked and deformed wretch, soon after contrived to obtain the chief power, and also to cause the murder of the young king and his still younger brother in the Tower. He then mounted the throne under the title of Richard III. For two years, this disgrace to humanity continued to reign, though universally abhorred by his people. At length, in 1485, Henry Tudor, Earl of Richmond, a connection rather than a descendant of the Lancaster family, resolved to make an attempt upon the English crown. Having landed with about 2000 followers at Milford Haven, he advanced into the country, and speedily gained such accessions of force as enabled him to meet and overthrow Richard at Bosworth Field, where the tyrant was slain, and the victorious Richmond was immediately proclaimed king, under the title of Henry VII. The new monarch soon after sought to strengthen his title by marrying Elizabeth, the daughter and heir of Edward IV., by which it was said the families of York and Lancaster were united.

HOUSE OF TUDOR—HENRY VII.

Under Henry VII. the country revived from the evils of a long civil war, in the course of which the chief nobility had been broken down, and the industry and commerce of the land interrupted. It was remarkable, nevertheless, that, during the past period, England was upon the whole an improving country. The evils of war had fallen chiefly on those who made it; the government, however disturbed by various claimants of the throne, was mild and equitable—at least as compared with that of other countries; and the people throve under a system in which their own consent, by the voice of the House of Commons, was necessary to the making of every new law, and the laying on of every tax.

The reign of Henry VII. was much disturbed by insurrections, in consequence of his imperfect title. A baker's boy, named Lambert Simnel, and a Jew's son, named Perkin Warbeck, were successively set up by the York party, the one as a son of the late Duke of Clarence and the other as the younger brother of Edward V., but were both defeated. Warbeck was hanged at Tyburn in 1499, and nearly about the same time, Henry procured, by forms of law, the death of the Earl of Warwick, the real son of the late Duke of Clarence, a poor idiot boy, whom he had kept fifteen years in confinement, and whose title to the throne, being superior to his own, rendered him uneasy.

Henry, though a cruel prince, as were most of the sovereigns of his age, was a sagacious and peaceful ruler. He paid great attention to all his affairs, and, in some of his acts, looked far beyond the present time. For example, by marrying his daughter Margaret to James IV. of Scotland, he provided for the possibility of the future union of the two crowns. By a law allowing men of property to break entails, he insured the reduction of the great lords, and the increase of the number of small proprietors. His constant policy was to depress the chief nobles, and to elevate the clergy, lawyers, and men of new families, as most likely to be dependent on him. The greatest fault of his character was his excessive love of money, of which he amassed an immense sum. During his reign, Ireland was made more dependent on the English crown by a statute prohibiting any parliament from being held in it until the king should give his consent.

HENRY VIII.

Henry VII. died in April, 1509, in the fifty-third year of his age. His oldest surviving son and successor, Henry VIII., was now in his eighteenth year. Young, handsome, and supposed to be amiable, he enjoyed at first a high degree of popularity. Some years before, he had been affianced to Catherine, a Spanish princess, who had previously been the wife of his deceased brother Arthur: he was now married to this lady, the Pope having previously granted a dispensation for that purpose. For many years the reign of Henry was unmarked by any unusual incidents. The chief administration of affairs was committed to a low-born but proud churchman, the celebrated Cardinal Wolsey. The king became much engaged in continental politics; and during a war which he carried on against France, his brother-in-law James IV., who sided with that state, made an unfortunate irruption into the north of England, and was overthrown and slain, with the greater part of his nobility (September 9, 1513), at Flodden.

About this time [illegible] changes of great importance to European society took place. Almost ever since the destruction of the Roman empire, the nations which arose out of it remained in subjection to the papal see, which might be said to have inherited the universal sway of the government, but altered from an authority over the bodies of men to an empire over their minds

In the opinion of many, this authority of the Roman Catholic religion had, in the course of time, become much abused, while the religion itself was corrupted by many superstitious observances. So long as men had continued to be the thoughtless warriors and unlettered peasants which they had been in the middle ages, it is not probable that they would ever have called in question either the authority of the pope or the purity of the Catholic faith. But, with knowledge, and the rise of a commercial and manufacturing class, came a disposition to inquire into the authority of this great religious empire. The art of printing, discovered about the middle of the preceding century, and which was now rendering literature accessible to most classes of the community, tended greatly to bring about this revolution in European intellect. The minds of men, indeed, seem at this time as if awaking from a long sleep; and it might well have been a question with persons who had reflection, but no experience, whether the change was to turn to evil or to good.

When men's minds are in a state of preparation for any great change, a very small matter is required to set them in motion. At Wirtemberg, in Germany, there was an Augustine monk, named Martin Luther, who became incensed at the Roman see, in consequence of some injury which he conceived to have been done to his order, by the Pope having granted the privilege of selling indulgences to the Dominican order of friars. Being a man of a bold and inquiring mind, he did not rest satisfied till he had convinced himself, and many others around him, that the indulgences were sinful, and that the Pope had no right to grant them. This happened about the year 1517. Controversy and persecution gradually extended the views of Luther, till he at length openly disavowed the authority of the Pope, and condemned some of the most important peculiarities of the Catholic system of worship. In these proceedings, Luther was countenanced by some of the states in Germany, and his doctrines were speedily established in the northern countries of Europe.

THE REFORMATION.

Henry VIII., as the second son of his father, had been originally educated for the church, and still retained a taste for theological learning. He now distinguished himself by writing a book against the Lutheran doctrines; and the Pope was so much pleased with it as to grant him the title of *Defender of the Faith*. Henry was not destined, however, to continue long an adherent of the Roman pontiff. In the year 1527, he became enamoured of a young gentlewoman named Anne Boleyn, who was one of his wife's attendants. He immediately conceived the design of annulling his marriage with Catherine, and marrying this younger and more agreeable person. Finding a pretext for such an act in the previous marriage of Catherine to his brother, he attempted to obtain from the Pope a decree, declaring his own marriage unlawful, and that the dispensation upon which it had proceeded was beyond the powers of the former Pope to grant. The Pontiff (Clement VII.) was much perplexed by this request of King Henry, because he could not accede to it without offending Charles V., Emperor of Germany, one of his best supporters, and the brother of Queen Catherine, and at the same time hoping that the professed powers of the Papacy, which were now trembling under the attacks of Luther.

Henry resolved to employ the influence of his minister, Cardinal Wolsey, who had now reached a degree of opulence and pride never before attained by a subject of England. But Wolsey, with all his greatness, could not venture to urge a matter disagreeable to the Pope, who was more his master than King Henry. The process went on for several years, and still his passion for Anne Boleyn continued unabated. Wolsey at length fell under the king's displeasure for refusing to serve him in this object, was stripped of all his places of power and wealth, and, in November, 1530, expired at Leicester Abbey, declaring that if he had served his God as diligently as his king, he would not thus have been given over in his grey hairs. The uncontrollable desire of the king to possess Anne Boleyn, was destined to be the immediate cause of one of the most important changes that ever took place in England—no less than a total reformation of the national religion. In order to annul his marriage with Catherine, and enable him to marry Anne Boleyn, he found it necessary to shake off the authority of the Pope, and procure himself to be acknowledged in Parliament as the supreme head of the English church. His marriage with Anne took place in 1533, and in the same year was born his celebrated daughter Elizabeth.

In 1536, Henry became as anxious to put away Queen Anne as he had ever been to rid himself of Queen Catherine. He had contracted a passion for Jane Seymour, a young lady then of the queen's bed-chamber, as Anne herself had been in that of Catherine. In order to gratify this new passion, he accused Anne of what appears to have been an imaginary frailty, and within a month from the time when she had been an honoured queen, she was beheaded (May 19) in the tower. On the very next day he married Jane Seymour, who soon after died in giving birth to a son (afterwards Edward VI.) His daughters, Mary and Elizabeth, were declared illegitimate by act of Parliament, and therefore excluded from the succession.

Hitherto, though professing independence of Rome, Henry still maintained, and even enforced, by severe and bloody laws, the most of its doctrines. He now took measures for altering this system of worship to something nearer the Lutheran model, and also for suppressing the numerous monasteries throughout the country. Being possessed of more despotic power, and, what is stranger still, of more popularity, than any former sovereign of England, he was able to encounter the dreadful risk of offending, by these means, a vastly powerful corporation, which seems, moreover, to have been regarded with much sincere affection and respect in many parts of England. No fewer than 645 monasteries, 2374 chanteries and chapels, 90 colleges, and 110 hospitals, enjoying altogether a revenue of £161,000, were broken up by this powerful and unscrupulous monarch. He partly seized the revenues for his own use, and partly gave them away to the persons who most actively assisted him, and who seemed most able to protect his government from the effects of such a sweeping reform. By this act, which took place in 1537, the Reformation was completed in England. Yet for many years Henry vacillated so much in his opinions, and enforced these with such severe enactments, that many persons of both religions were burnt as heretics. It was in the southern and eastern parts of England, where the commercial classes at this time chiefly resided, that the doctrines of the Reformation were most prevalent. In the western and northern parts of the country, Catholicism continued to flourish; and in Ireland, which was remotest of all from the Continent, the Protestant faith made little or no impression.

After the death of Jane Seymour, Henry married Anne of Cleves, a German princess, with whose person, however, he was not pleased; and he therefore divorced her by an act of Parliament. He next married Catherine Howard, niece to the Duke of Norfolk; but had not been long united to her when he discovered that she had committed a serious indiscretion before marriage. This was considered a sufficient reason for beheading the unfortunate queen, and attainting all her relations. Though Henry had thus murdered two wives, and divorced other two, and become, moreover, a monster in form as well as in his passions and mind, he succeeded in obtaining for his sixth wife (1543) Catherine Parr, widow of Lord Latimer, who, it is certain, only contrived to escape destruction by

her extraordinary prudence. Almost all who ever served Henry VIII. as ministers, either to his authority or to his pleasures, were destroyed by him. Wolsey was either driven to suicide, or died of a broken heart; Thomas Cromwell, who succeeded that minister, and chiefly aided the king in bringing about the Reformation—Sir Thomas More, lord chancellor, the most virtuous, most able, and most consistent man of his time—the Earl of Surrey, who was one of the most accomplished knights of the age, and the first poet who wrote the English language with perfect taste—all suffered the same fate with Anne Boleyn and Catherine Howard.

When James IV. died at Flodden, in 1513, the Scottish crown fell to his infant son JAMES V., who struggled through a turbulent minority, and was now a gay, and, upon the whole, an amiable prince. His uncle, Henry VIII., endeavoured to bring him into his views respecting religion; but James, who was much in the power of the Catholic clergy, appears to have wished to become the head of the Popish party in England, in the hope of succeeding, by their means, to the throne of that country. A war latterly broke out between the two monarchs, and the Scottish army having refused to fight, from a dislike to the expedition, James died (December 1542) of a broken heart, leaving an only child MARY, who was not above a week old. Henry immediately conceived the idea of marrying his son Edward to this infant queen, by which he calculated that two hostile nations should be united under one sovereignty, and the Protestant Church in England be supported by a similar establishment in Scotland. This project, however, was resisted by the Scots, of whom very few as yet were inclined to the Protestant doctrines. Henry, enraged at their hesitation, sent a fleet and army, in 1544, to inflict vengeance upon them. The Scots endured with great patience the burning of their capital city, and many other devastations, but still refused the match. The government of Scotland was now chiefly in the hands of Cardinal Beaton, a man of bold and decisive intellect, who zealously applied himself to suppress the reforming preachers, and regarded the English match as likely to bring about the destruction of his religion.

EDWARD VI.—QUEEN MARY.

Henry died, January 28, 1547, leaving the throne to his only son, a boy of ten years of age, who was immediately proclaimed king under the title of EDWARD VI. The Duke of Somerset, maternal uncle to the young king, became supreme ruler under the title of Protector, and continued to maintain the Protestant doctrines. Under this reign, the church of England assumed its present form, and the Book of Common Prayer was composed nearly as it now exists. Somerset being resolved to effect, if possible, the match between Edward VI. and Mary of Scotland, invaded that country in autumn 1547, and was met at Musselburgh by a large army under the governor, the Earl of Arran. Though the Scotch were animated by bitter animosity against the English, against their religion, and against the object of their expedition, they did not fight with their usual resolution, but were defeated, and pursued with great slaughter. Finding them still obstinate in refusing to give up their queen, Somerset laid waste a great part of the country, and then retired. Previous to this period, Cardinal Beaton had been assassinated by private enemies; but the Scotch were encouraged to persevere by the court of France, to which they now sent the young queen for protection.

In the reign of Edward VI. the government was conducted mildly, until the Protector Somerset was degraded from his authority by the rising influence of Dudley, Duke of Northumberland, who caused him soon after to be tried and executed. Northumberland, who was secretly a Roman Catholic, was not so mild or popular a ruler. Yet, throughout the whole reign of Edward VI., which was terminated by his death on the 6th of July 1553, at the early age of sixteen, no religious party was persecuted, except those who denied the fundamental doctrines of the Christian religion. It would have been well for the honour of a church which has produced many great men, and to which the modern world is indebted for the very existence of Christianity, if it had not been tempted after this period to commence a very different course of action. The crown now belonged by birthright to Mary, the eldest daughter of Henry VIII., who was a zealous Catholic. Northumberland, however, assuming the illegitimacy of that princess and her sister Elizabeth, set up as queen the Lady Jane Grey, who was descended from a younger sister of king Henry, and who had been married to a son of the Duke of Northumberland. Lady Jane was the most beautiful, most intelligent, and most amiable of all the females who appear in the history of England. Though only seventeen, she was deeply learned, and yet preserved all the unaffected graces of character proper to her interesting age. Unfortunately, her father-in-law Northumberland was so much disliked, that the Catholics were enabled to displace her from the throne in eight days, and to set up in her stead the Princess Mary. Northumberland, Lady Jane, and her husband, Guilford Lord Dudley, were all beheaded by that savage princess, who soon after took steps for restoring the Catholic religion, and married Philip II., King of Spain, in order to strengthen herself against the Protestant interest. Mary experienced some resistance from her Protestant subjects, and being under great suspicion of her sister Elizabeth, who professed the reformed faith, but took no part against her, was almost on the point of ordering her to execution also. As soon as she had replaced the Catholic system, and found herself in possession of sufficient power, she began that career of persecution which has rendered her name so infamous. Five out of fourteen Protestant bishops, including the reverend names of Cranmer, Latimer, and Ridley, were committed to the flames as heretics; and during the ensuing part of her reign, which was closed by her death, November 17, 1553, nearly three hundred persons suffered in the same manner. These scenes did not take place without exciting horror in the minds of Englishmen in general, including even many Catholics; but the royal authority was at all times too great under this line of princes to allow of effectual resistance. Such a persecution, however, naturally fixed in the minds of the British Protestants a hereditary horror for the name of Catholic, which has in its turn been productive of many retaliatory persecutions almost equally to be lamented. In the latter part of her reign, she was drawn by her husband into a war with France, of which the only effect was the loss of Calais, the last of the French possessions of the sovereigns of England. The natural sourness of Mary's temper was increased by this disgraceful event, as well as by her want of children, and she died in a state of great unhappiness.

ELIZABETH.—MARY, QUEEN OF SCOTS.—REFORMATION IN SCOTLAND.

A more auspicious scene opened for England in the accession of ELIZABETH, a princess of great native vigour of mind, and who had been much improved by adversity, having been kept in prison during the whole reign of her sister. From the peculiar circumstances of Elizabeth's birth, her right of succession was denied by all the Catholics at home and abroad. This party considered Mary, Queen of Scots, who was descended from the eldest sister of Henry VIII., and had been brought up in the Catholic faith at the court of France, as their legitimate sovereign. Elizabeth had no support in any quarter, except among the Protestant subjects. The Pope issued a bull, which directly, or indirectly, pronounced her an usurper, and gave permission to her

subjects to remove her from the throne. The court of France professed to consider the Queen of Scots, who had recently been married to the Dauphin, as the Queen of England. Under these circumstances, Elizabeth found no chance of safety except in restoring and maintaining the Protestant religion in her own country, and in seeking to support it in all others where the people were favourable to it. The Scottish nation being now engaged in a struggle with their regent, Mary of Guise, in behalf of Protestantism, Elizabeth gladly acceded to a proposal made by the nobles of that country, and sent a party of troops, by whose assistance the reformed religion was established (1560). In bringing about this change, the chief native leaders were James Stewart, a natural son of King James V., and John Knox, who had once been a friar, but was now a Protestant preacher. As a natural consequence of the obligation which the English queen had conferred upon the Scottish reformers, she acquired an influence over the country which was never altogether lost.

About the time when the Scottish Parliament was establishing the reformed religion, Mary of Guise breathed her last, leaving the country to be managed by the reforming nobles. Her daughter, the Queen of Scots, now eighteen years of age, and the most beautiful woman of her time, had in 1559 become the queen-consort of France; but, in consequence of the death of her husband, she was next year left without any political interest in that country. She accordingly, in August, 1561, returned to Scotland, and assumed the sovereignty of a country which was chiefly under the rule of fierce nobles, and where the people, from the difference of their religious faith, as well as their native barbarism, were little fitted to yield her the obedience of loyal subjects.

REFORMATION IN SCOTLAND.

The change of religion in Scotland was of a more decisive kind than it had been in England. The English Reformation had been effected by sovereigns, who, while they wished to throw off the supremacy of the Pope, and some of the Catholic rites, desired to give as little way as possible to popular principles. They therefore not only seized the supremacy of the church to themselves, but, by bishops and other dignitaries, made it an efficient instrument for supporting monarchical government. In Scotland, where the Reformation was effected by the nobles and the people, at a time when still bolder principles had sprung up, none of this machinery of power was retained; the clergy were placed on a footing of perfect equality; they were all of them engaged in parochial duties, and only a small part of the ancient ecclesiastical revenues was allowed to them. In imitation of the system established at Geneva, their general affairs, instead of being intrusted to the hands of bishops, were confided to courts formed by themselves. These courts, being partly formed by lay elders, kept up a sympathy and attachment among the community, which has never existed in so great a degree in the English church. What was of perhaps still greater importance, while a large part of the ancient revenues was absorbed by the nobles, a very considerable portion was devoted to the maintenance of parish schools, under the express control of the clergy. These at once formed regular nurseries of Protestant Christians, and disseminated the elements of learning more extensively over this small and remote country than it had ever been over any other part of the world.

MARY QUEEN OF SCOTS.

Queen Mary, having no male power in her own country, was obliged to govern by means of her natural brother, James Stewart, whom she created Earl of Moray, and who was the leader of the Protestant interest in Scotland. Personally, however, she was intimately connected with the great Catholic powers of the Continent, and became a party, in 1564, to a coalition formed by them for the suppression of Protestantism all over Europe. She had never yet resigned her pretensions to the English throne, but lived in the hope, that, when the Catholics succeeded in everywhere subduing the Protestants, she would attain that object. Elizabeth, who had only the support of the Protestant part of her own subjects, with a friendly feeling among the Scotch and other unimportant Protestant nations, had great reason to dread the confederacy formed against her. She nevertheless stood firm upon the Protestant faith, and the principles of a comparatively liberal and popular government, as the only safe position.

A series of unfortunate events threw Mary into the hands of Elizabeth. The former queen, in 1565, married her cousin Lord Darnley, and by that means alienated the affections of her brother and chief minister, the Earl of Moray, as well as of other Protestant lords, who raised a rebellion against her, and were obliged to fly into England. Soon after, the jealousy of Darnley, respecting an Italian musician named Rizzio, who acted as French secretary to the queen, united him in a conspiracy with the banished Protestant noblemen for the murder of that humble foreigner, which was effected under very barbarous circumstances, March 9, 1566. Mary, who was delivered, in the succeeding June, of her son James, withdrew her affections entirely from her husband, and began to confide chiefly in the Earl of Bothwell, who some months afterwards caused Darnley to be blown up by gunpowder, while he lay in a state of sickness; in which transaction it has always been suspected, but never proved, that the queen had a considerable share. Bothwell soon after forced her, in appearance, into a marriage, which excited so much indignation among her subjects, that the same Protestant lords who had effected the Reformation, and were the friends of Elizabeth, easily obtained the possession of her person, and, having deposed her, crowned her infant son as king, under the title of JAMES VI., while the regency was vested in the Earl of Moray. In May 1568, Mary escaped from her prison in Lochleven, and put herself at the head of a body of her partisans, but was defeated by the regent at the battle of Langside, and was then compelled to seek refuge in England. By placing her son under strict confinement, and extending an effectual protection to the regents Moray, Lennox, Mar, and Morton, who successively governed Scotland, Elizabeth fortified herself in a great degree against the Catholic confederacy.

GOVERNMENT OF ELIZABETH.

It has already been seen that the liberties of the people were much favoured by the frequent interruptions in the succession to the crown. Whenever one branch of the Plantagenet family displaced another, the new king, feeling himself weak, endeavoured to strengthen his title by procuring a parliamentary enactment in support of it. It thus became established as a regular principle in the English government, that the people who were represented in Parliament had something to say in the appointment of their king. A considerable change, however, had taken place since the accession of Henry VII. The great power acquired by that king, through his worldly wisdom and the destruction of the nobility during the civil wars, had been handed down through four successive princes, who inherited the crown by birthright, and did not require to cringe to the people for a confirmation of their title. The Parliaments, therefore, were now a great deal more under the control of the sovereign than they had formerly been. From an early period of his reign, Henry VIII. never permitted his Parliament to oppose his will in the least. To the various changes of religion under successive sovereigns, the

Parliaments presented no obstacle. An idea was now beginning to arise, very much through the supremacy which the sovereigns had acquired over the church, that the right of the crown was one derived from God, and that the people had nothing to do with it, except to obey what it dictated to them. Of this notion, no one took so much advantage, or was at so much pains to impress it, as Elizabeth. No doubt, her arbitrary measures were generally of a popular nature, yet this does not excuse them in principle; and their ultimate mischief is seen in the attempts of future sovereigns to pursue worse ends upon the same means. Elizabeth's government consisted entirely of herself and her ministers, who were, from the beginning to the end of [illegible] reign, the very choice of the enlightened men of [illegible]. Her prime minister was the celebrated Lord Burleigh, by far the most sagacious man who ever acted as a minister in Britain; and all her emissaries to foreign courts were of one complexion—circumspect and penetrating men, devoted to their country, their mistress, and to the Protestant religion.

On the accession of Elizabeth, the two celebrated acts of supremacy and conformity were passed, for the purpose of crushing the political influence of the Popish religion; an end which they sufficiently accomplished. By the act of supremacy, all beneficial clergymen, and all holding offices under the crown, were compelled to take an oath abjuring the temporal and spiritual jurisdiction of any foreign prince or prelate, on pain of forfeiting their offices, while any one maintaining such supremacy was liable to heavy penalties. The other statute prohibited any one from following any clergyman who was not of the established religion, under pain of forfeiting his goods and chattels for the first offence, of a year's imprisonment for the second, and of imprisonment during life for the third; while it imposed a fine of a shilling on any one absenting himself from the established church on Sundays and holidays. By means of a court of ecclesiastical commission, which the queen erected, these laws, and others of a more trifling and vexatious nature, were enforced with great severity. It may afford some idea of the barbarity of the age, and of the terror in which the Church of Rome was now held, that, during the reign of Elizabeth, one hundred and eighty persons suffered death by the laws affecting Catholic priests and converts.

WAR IN THE NETHERLANDS.

For more than a century after the Reformation, religion was the real or apparent motive of the most remarkable transactions in European history. It is scarcely necessary to point out that this sentiment, though in general the purest by which human beings can be actuated, is, like all the other higher sentiments of our nature, when offended or shocked, capable of rousing the inferior sentiments into great activity. In the sixteenth and seventeenth centuries, European society was comparatively unenlightened and barbarous; we therefore find that variances of opinion respecting religion were then productive of far fiercer feelings than they are in our own more humane age. The Protestant heresy, as it was termed by the Catholics, was also a novelty, the remote effects of which no man could foretell; it was mingled with political questions, and by some princes supposed to forebode a general revolt against [illegible] authority. We are not therefore to wonder that great cruelties were committed, either by the Catholics in seeking to support the Church of Rome, or by the Protestants in endeavouring to ensure themselves against a renewal of severities inflicted by the opposite party. Nor is it necessary, in the present age, that the adherents of either faith should retain any feeling of displeasure against the other, on account of barbarities which took their rise in the ignorance and rudeness of a former period, and of which the enlightened of both parties have long since disapproved.

In the Netherlands, which formed part of the dominions of Philip II. of Spain, the reformed faith had made considerable advances. Philip, like other Catholic princes, entertained the idea that this new creed, besides being condemnable as a heresy and an offence against the Deity, tended to make men independent of their rulers. Finding the people obstinate in their professions, he commenced a war with the Netherlanders, for the purpose of enforcing his authority over their consciences. This war lasted about twenty years; for the Netherlanders, though a nation of no great strength, fought like desperate men, and endured the most dreadful hardships rather than submit. The chief leader in this war of liberty was William, Prince of Orange, one of the purest and most courageous patriots that ever breathed. Elizabeth could not help wishing well to the Netherlanders, though for a long time her dread of Spain, then one of the greatest powers in Europe, prevented her from openly assisting them. At the same time, about two millions of the people of France were Protestants, or, as they were then called Huguenots, who [illegible] for the general Protestant cause with as much energy as the great strength of the French government would permit. Elizabeth at length, in 1578, extended an open protection to the Netherlanders, excusing herself to Philip by stating her fear that they would otherwise throw themselves into the arms of France. The northern provinces were thus enabled to assert their independence, and to form the country which has since been called Holland.

DEATH OF MARY, QUEEN OF SCOTS.

The Catholic powers of the continent formed many schemes for annoying or dethroning Elizabeth; and the imprisoned Scottish Queen, or her adherents, were generally concerned in them. The King of Spain, determined at length to make a decisive effort, commenced the preparation of a vast fleet, which he termed the Invincible Armada, and with which he designed to invade the English shores. Elizabeth, her ministers, and people, beheld the preparations with much concern, and their fears were increased by the plots which were incessantly forming among her Catholic subjects in behalf of the Queen of Scots. An act was passed declaring that any person, by or *for* whom any plot should be made against the Queen of England, should be guilty of treason. When, soon after, a gentleman named Babington, formed a conspiracy for assassinating Elizabeth and placing Mary on the throne, the latter queen became of course liable to the punishment for treason, although herself innocent. She was subjected to a formal trial in her prison of Fotheringay Castle, and found guilty. Elizabeth hesitated for some time to strike an unoffending and unfortunate person, related to her in blood, and her equal in rank. But at length fears for herself got the better of her sense of justice, and, it may be added, of her good sense, and she gave her sanction to an act which leaves an ineffaceable stain upon her memory. On the 7th of February, 1587, Mary Queen of Scots was beheaded in the hall of the castle, after a confinement of more than eighteen years.

James VI. was now, after a turbulent minority, in possession of the reins of government in Scotland, but with little real power, being a dependent and pensioner of Elizabeth, and at the same time much controlled by the clergy, who asserted a total independence of all temporal authority, and considered themselves as the subjects alone of the divine founder of the Christian faith. James made many attempts to assert a control over the church like that enjoyed by the English monarch, and also to introduce an Episcopal hierarchy, but never could attain more than a mere shadow of his object. The

chief influence he possessed arose from his being regarded as heir-presumptive to the English crown.

SPANISH ARMADA.—REBELLIONS IN IRELAND.

In 1588, the Spanish Armada, consisting of a hundred and thirty great vessels, with twenty thousand land forces on board, set sail against England, while thirty-four thousand more land forces prepared to join from the Netherlands. Amidst the consternation which prevailed in England, active measures were taken to defend the country; thirty vessels prepared to meet the Armada, and another fleet endeavoured to block up the Netherlands forces in port. The command was taken by Lord Howard, of Effingham. Troops were also mustered on land to repel the invaders. The English fleet attacked the Armada in the Channel, and was found to have a considerable advantage in the lightness and manageableness of the vessels. As the Armada sailed along, it was infested by the English in the rear, and, by a series of desultory attacks, so damaged as to be obliged to take refuge on the coast of Zealand. The Duke of Parma now declined to embark the Netherlands forces, and it was resolved by the admiral, that they should return to Spain by sailing round the Orkneys, as the winds were contrary to their passage directly back. Accordingly, they proceeded northward, and were followed by the English fleet as far as Flamborough-head, where they were terribly shattered by a storm. Seventeen of the ships, having 5000 men on board, were cast away on the Western Isles and the coast of Ireland. Of the whole Armada, fifty-three ships only returned to Spain, and these in a wretched condition. The seamen, as well as the soldiers who remained, were so overcome with hardships and fatigue, and so dispirited by their discomfiture, that they filled all Spain with accounts of the desperate valour of the English, and of the tempestuous violence of that ocean by which they were surrounded.

Though the Protestant church had meanwhile been established in Ireland, the great bulk of the people continued to be Roman Catholics. The native rudeness of the people and their chiefs, and the discontent occasioned by what was considered as a foreign church establishment, rendered the country turbulent and difficult to govern. Sir John Perrot, the deputy, proposed to improve the country by public works and English laws; but it was thought injurious to England to improve the condition of Ireland. A series of rebellions under chiefs named O'Neill was the consequence, and the English government was maintained with great difficulty, and at an enormous expense. The rebellion of Hugh O'Neill, Earl of Tyrone, was particularly formidable. The English officers were at first unsuccessful, and met with some serious defeats. In 1599, Tyrone gained so great a victory, that the whole province of Munster declared for him. He then invited the Spaniards to make a descent on Ireland, and join him. The queen sent over her favourite, the Earl of Essex, with 20,000 men; but he did not proceed with vigour, and soon after found it necessary to return to England to justify himself. Next year Tyrone broke the truce he had formed with Essex, overran the whole country, and acted as sovereign of Ireland. If Spain had at this time given him the support he asked, Ireland might have been dissevered from the English crown.

Elizabeth now selected, as her deputy for Ireland, Blount, Lord Mountjoy, who was in every respect better fitted than Essex to conduct such a warfare. As a preliminary step, this sagacious officer introduced jealousy and disunion among the Irish chiefs. The very celerity of his movements tended to dispirit the insurgents. In 1601, six thousand Spaniards landed in Kinsale harbour, for the purpose of supporting the Irish. Mountjoy immediately invested the place, and prevented them from acting. Tyrone marched from the south of Ireland to their relief, and was met and overthrown by a much inferior English force, after which Kinsale was surrendered. About the time when Elizabeth died (1603), Tyrone submitted, and Ireland was once more reduced under the authority of the English crown.

CONCLUSION OF THE REIGN OF ELIZABETH.

It is remarkable, that while Elizabeth increased in power and resources, she became more noted for feminine weaknesses. In her early years she had shown a stoicism, and superiority to natural affections, not usually observed in women. But in her old age, she became both volatile and susceptible to an extraordinary degree; so that the hand which she had withheld, in her younger days, from the noblest princes of Europe, seemed likely to be bestowed, in her old age, upon some mere court minion. Her favourite in middle life was Robert, Earl of Leicester, a profligate and a trifler. In her latter days she listened to the addresses of the Earl of Essex, a young man of greater courage and better principle, but also headstrong and weak. Essex, who had acquired popularity by several brilliant military enterprises, began at length to assume an insolent superiority over the queen, who was, on one occasion, so much provoked by his rudeness as to give him a hearty box on the ear. Notwithstanding all his caprices and insults, the queen still dotingly forgave him, until he at length attempted to raise an insurrection against her in the streets of London, when he was seized, condemned, and after much hesitation executed (February 25, 1601).

Elizabeth, in at last ordering the execution of Essex, had acted upon her usual principle of sacrificing her feelings to what was necessary for the public cause; but in this effort, made in the sixty-eighth year of her age, she had miscalculated the real strength of her nature. She was seen from that time to decline gradually in health and spirits.

About the close of 1601, she fell into a deep hypochondria or melancholy. She could scarcely be induced to have herself dressed, and at length became so much absorbed by her sorrow as to refuse sustenance, and sat for days and nights on the floor, supported by a few cushions brought to her by her attendants. On the 24th of March, 1603, she expired, after a reign of nearly forty-five years, during which England advanced from the condition of a second-rate to that of a first-rate power, and the Protestant religion was established on a basis from which it could never afterwards be shaken.

The reign of Elizabeth saw the commencement of the naval glory of England. Down to the reign of Henry VII., there was no such thing as a navy belonging to the public, and the military genius of the people was devoted exclusively to enterprises by land. The rise, however, of a commercial spirit in Europe, which in 1492 had caused the discovery of America, and was again acted upon by the scope for adventure which that discovery opened up, had latterly caused great attention to be paid to nautical affairs in England. Englishmen of all ranks supported and entered into enterprises for discovering unknown territories; and under Drake, Cavendish, Raleigh, and Frobisher, various expeditions of less or more magnitude were sent out. The colonies of North America were now commenced. Amongst the exertions of private merchants, our attention is chiefly attracted by the commencement of the northern whale-fishery, the cod-fishery of Newfoundland, and the less laudable slave-trade in Africa. When hostilities with Spain became more open, the English commanders made many successful attacks upon her colonies in the West Indies, and also upon the fleets of merchant vessels which were employed to carry home the gold, and other almost equally valuable products of the New World, to the Spanish harbours. These attacks were now made in a

more systematic manner, and with more effect, as a revenge for the affair of the Armada. It may almost be said that the dominion of Britain over the seas was perfected in one reign; a power which has been of such advantage to the country, both in protecting its commerce and keeping it secure from foreign invasion, that its origin would have conferred everlasting lustre on this period of our history, even although it had not been characterized by any other glorious event.

The chief articles exported from England to the Continent were wool, cloth, lead, and tin: formerly these had been sent in vessels belonging to the Hanse Towns—certain ports of the north of Europe, possessing great privileges—but now English vessels were substituted for this trade. Birmingham and Sheffield were already thriving seats of the hardware manufacture, and Manchester was becoming distinguished for making cottons, rugs, and friezes. Stocking-weaving and the making of sailcloth, serge, and baize, took their rise in this reign. The progress of other arts was much favoured by the bloody persecutions in the Netherlands, which drove into England great numbers of weavers, dyers, cloth-dressers, and silk-throwers. Amongst the wealthier classes, the wearing of handsome apparel and of gold ornaments and jewelry, made a great advance. Coaches were introduced, but for a time thought only fit for the use of ladies. Great improvements were made in the building of houses. Theatrical amusements were begun, and attained great vogue, though only in London. The smoking of tobacco was introduced by Sir Walter Raleigh, who became acquainted with the plant in Virginia. At the end of Elizabeth's reign, the population of London was about 160,000, or a tenth of what it now is; and the whole kingdom probably contained about 6,000,000 of inhabitants.

THE STUARTS—JAMES I.

The successor of Elizabeth, by birthright, was JAMES VI. OF SCOTLAND (styled JAMES I. OF ENGLAND), who was now arrived at the prime of life, and had been married for some years to the Princess Anne of Denmark, by whom he had two sons, Henry and Charles, and one daughter named Elizabeth. James immediately removed to London, and assumed the government of England, while his native kingdom, though thus united under the same sovereignty, still retained its own peculiar institutions. At the suggestion of the king, who wished to obliterate the distinction of the two countries, the common name of *Great Britain* was now conferred upon them. King James was an oddity in human character. His person was naturally feeble, particularly in the limbs, which were scarcely sufficient to support his weight. He had great capacity for learning, some acuteness, and a considerable share of wit; but was pedantic, vain, and weak. He believed kings to be the deputies of God, and accountable to God alone for their actions. He was equally disposed with Elizabeth to govern despotically, or according to his own will; but he wanted the vigour and the turn for popularity which enabled his predecessor to become so much the mistress of her subjects.

Notwithstanding the energy of Elizabeth, the popular spirit had gradually been acquiring force in her reign. It was chiefly seen in the acts of the Puritans, a religious party who wished to make great reforms in the church, both in its government and its worship, and who, from the fervour of their devotions and the strictness of their manners, might be likened to the Presbyterians of Scotland. King James found considerable difficulty at the very first in controlling this party and evading their demands. He was no less troubled, on the other hand, by the Catholics, who, recollecting his mother Mary, conceived that he would be inclined to make matters more easy to them in England. Upon the whole, there were such difficulties in the way, as, to have steered clearly through them, would have required a wiser instead of a weaker ruler than Elizabeth.

GUNPOWDER PLOT.

The disappointment of the Catholics, on finding that the severe laws against them were not to be relaxed, led to a conspiracy on the part of a few gentlemen of that persuasion, of whom the chief was William Catesby, a person of dissolute habits. It was arranged that, on the day of the meeting of Parliament, November 5, 1605, the House of Lords should be blown up by gunpowder, at the moment when the King, Lords, and Commons, were all assembled in it, thus destroying, as they thought, all their chief enemies at one blow, and making way for a new government which should be more favourable to them. Accordingly, thirty-four barrels of powder were deposited in the cellars beneath the house, and a person named Guy Fawkes was prepared to kindle it at the proper time. The plot was discovered, in consequence of the receipt of a letter by Lord Monteagle, warning him not to attend the meeting of Parliament. An investigation took place during the night between the 4th and 5th of November, when the gunpowder was discovered, and Fawkes taken into custody. He confessed his intentions; and the rest of the conspirators fled to the country, where most of them were cut to pieces in endeavouring to defend themselves. Notwithstanding the atrocious character of this plot, the king could never be induced to take advantage of it, as most of his subjects desired, for the purpose of increasing the persecution of the Catholic party: he probably feared that new severities might only give rise to other attempts against his life.

PLANTATIONS IN IRELAND.

The state in which the king found Ireland at his accession, afforded an opportunity for commencing a more generous policy in reference to that country, and introducing regulations favourable to internal improvement. Previously to this reign, the legislative authority of the English government was confined to the small district called the "Pale," while the rest was governed by native sovereigns or chiefs, whose connection with the King of England was merely that of feudal homage, which did not prevent them from making wars or alliances with each other. Subject to depredations from these powerful barons, the native Irish, from a very early period, petitioned for the benefit of the English laws; but the Irish Parliament, which was composed of the English barons, was never at a loss for the means of preventing this desirable measure from being effected. James was, in reality, the first king who extended the English law over the whole of Ireland, by making judicial appointments suited to the extent of the country. This he was enabled to do, by the recent wars having put the country more completely in his power than it had been in that of any former monarch. He began by extending favour to the Irish chiefs, not excepting Tyrone. He passed an act of oblivion and indemnity, by which all persons who had committed offences, coming to the judges of assize within a certain day, might claim a full pardon. At the same time, toleration was virtually refused to the Catholic persuasion, and much discontent therefore still existed. Some of the chieftains, having conspired against the crown, were attainted, and their lands were given to English settlers, with a view to improving the population of the country by an infusion of civilized persons. But this experiment, though well-meant, was managed in a partial spirit, and gave rise to much injustice. In 1613, the first Irish Parliament was held in which there were any representatives of places beyond the Pale.

THE KING'S CHILDREN.—THE SPANISH MATCH.

In 1612, the king had the misfortune to lose his eldest son, Henry, a youth of nineteen, who was considered

as one of the most promising and accomplished men of the age. The second son, Charles, then became the heir-apparent, and James was busied for several years in seeking him out a suitable consort. The Princess Mary of Spain was selected, a match which could ot be popular, considering that the young lady was a Catholic, and of a family who had long been the enemies of England. The prince, attended by the Duke of Buckingham, made a romantic journey in disguise to Madrid, to push the match; but a quarrel between the British and Spanish ministers led to its being broken off, and to a bloody war between the two nations.

Elizabeth, the only remaining child of the king, was married, in 1613, to Frederick, Prince Palatine of the Rhine, who was afterwards so unfortunate as to lose his dominions, in consequence of his placing himself at the head of the Bohemians, in what was considered as a rebellion against his superior, the Emperor of Germany. This discrowned pair, by their youngest daughter Sophia, who married the Duke of Brunswick, were the ancestors of the family which now reigns in Britain.

FEATURES OF JAMES I.'S GOVERNMENT.

The reign of James I. was not marked by what are called great events. This was greatly owing to his timid character, which induced him to maintain peace, at whatever sacrifice, throughout the greater part of his reign. The prime leaders of his government were youthful favourites, who possessed ... merit but personal elegance. Experienced statesmen, brave soldiers, and learned divines had to bow to these dissolute youths, if they wished to remain, and still more if they hoped to advance, in the royal favour. Even Bacon, the noblest intellect of the age, and who, by the result of his studies, has done more than almost any other man to promote the progress of knowledge, is found to have attached himself to the minion Duke of Buckingham, for the purpose of improving his interest at court.

In despotic countries, the vices of the court often corrupt all classes; but it was otherwise at that period in Britain. The country gentlemen, and the merchants in the incorporated towns, had privileges which the court dared not to violate, and a feeling of rectitude and independence was encouraged among these classes, which the statesmen of the age too much overlooked. The House of Commons gave frequent resistance to the court, and often compelled James to yield, at the very moment when he was preaching his doctrines of divine right. In his first Parliament, they took into consideration several grievances, such as *purveyance*, a supposed right in the officers of the court to seize what provisions they pleased, at any price, or at no price; another was the right of granting *monopolies*, which had become a source of revenue to the court by cheating the country, certain persons having the monopoly of certain manufactures and articles of domestic consumption, which they were allowed to furnish at their own prices. The Commons likewise remonstrated against pluralities in the church, and against a new set of canons which the king and the church tried to force on the nation without their consent. In 1614, they threatened to postpone any supply till their grievances were redressed. The king, in his turn, threatened to dissolve them if they did not immediately grant a supply; and they allowed him to take his course, which did not fill his coffers. These, and many other instances of bold resistance, should have been warning to the court. They were the shadows of coming events, and attention to them might have saved the bloodshed and confusion of the next reign.

The English literature, which first made a decisive advance in the reign of Elizabeth, continued to be cultivated with great success in the reign of King James. The excellence of the language at this time as a medium for literature, is strikingly shown in the translation of the Bible now executed. It is also shown in the admirable dramatic writings of Shakspeare, and in the valuable philosophic works of Bacon. The inductive philosophy made known by the last writer—namely, that mode of reasoning which consists in first ascertaining facts, and then inferring conclusions from them—reflects peculiar lustre on this period of our history. Very great praise is also due to Napier of Merchiston, in Scotland, for the invention of *logarithms*, a mode of calculating great numbers, essential to the progress of mathematical science.

CHARLES I.—HIS CONTENTIONS WITH THE HOUSE OF COMMONS.

King James died in March, 1625, in the fifty-ninth year of his age, and was succeeded by his son CHARLES, now twenty-five years of age. One of the first acts of the young king was to marry the Princess Henrietta Maria, daughter of Henry IV. of France, and a Catholic. This was an unfortunate step for the house of Stuart, for the two eldest sons of the king and queen, though educated as Protestants, were influenced in some measure by the religious creed of their mother, so that they ultimately became Catholics; and this, in the case of the second son, James II., led to the family being expelled from the throne.

After breaking off the proposed match with the Princess Mary of Spain, Britain eagerly threw itself into a war with that country, which was still continued. To supply the expenses of that contest, and of a still more unnecessary one into which he was driven with France, the king applied to Parliament, but was met there with so many complaints as to his government, and such a keen spirit of popular liberty, that he deemed it necessary to revive a practice followed by other sovereigns, and particularly Elizabeth, of compelling his subjects to grant him gifts, or, as they were called, *benevolences*, and also to furnish ships at their own charge, for carrying on the war. Such expedients, barely tolerated under the happy reign of Elizabeth, could not be endured in this age, when the people and the Parliament were so much more alive to their rights. A general discontent spread over the nation. The Commons, seeing that if the king could support the state by self-raised taxes, he would soon become independent of all control from his Parliaments, resolved to take every measure in their power to check his proceedings. They also assailed him respecting a right which he assumed to imprison his subjects upon his own warrant, and to detain them as long as he pleased. Having made an inquiry into the ancient powers of the crown, before these powers had been vitiated by the tyrannical Tudors, they imbodied the result in what we called a PETITION OF RIGHT, which they presented to him as an ordinary bill, or rather as a second Magna Charta, for replacing the privileges of the people, and particularly their exemption from arbitrary taxes and imprisonment, upon a fixed basis. With great difficulty Charles was prevailed upon to give his sanction to this bill (1628); but his disputes with Parliament soon after ran to such a height, that he dissolved it in a fit of indignation, resolving never more to call it together. About the same time, his favourite minister, the Duke of Buckingham, was assassinated at Portsmouth, and Charles resolved thenceforward to be in a great measure his own minister, and to trust chiefly for the support of his government to the English hierarchy, to whose faith he was a devoted adherent, and who were, in turn, the most loyal of his subjects. His chief counsellor was Laud, Archbishop of Canterbury, a man of narrow and bigoted spirit, and who made it his duty rather to increase than to diminish the ceremonies of the English church, although the tendency of the age was decidedly favourable to their diminution. For some years Charles governed the country entirely as an irresponsible despot, levying taxes by his own orders, and imprisoning such persons as

were obnoxious to him, in utter defiance of the Petition of Right. The Puritans, or church reformers, suffered most severely under this system of things. They were dragged in great numbers before an arbitrary court called the Star-Chamber, which professed to take cognisance of offences against the king's prerogative, and against religion; and sometimes men venerable for piety, learning, and worth, were scourged through the streets of London, and had their ears cut off, and their noses slit, for merely differing in opinion, on the most speculative of all subjects, with the king and his clergy. The great body of the people beheld these proceedings with horror, and only some opportunity was wanted for giving expression to the public feeling.

It is to be observed, that none of the taxes imposed by Charles were in themselves burdensome; the country was then in a most prosperous condition, and the taxes far less in proportion to every man's means than they have ever since been. It was only to the principle of their being raised without Parliamentary sanction, which had formerly been so necessary a control on the royal power, that the people were disposed to resist them. It may easily be supposed, that, though there might be a general disposition to resistance, the most of individuals would not like to be the first to come forward for that purpose, as, in such an event, they would have been sure to experience the severest persecution from the court. At length, John Hampden, a gentleman of Buckinghamshire, resolved to undergo any personal inconvenience rather than pay his twenty shillings of ship-money. The case was tried in the Exchequer (1637); and as the judges were then dismissible at the royal pleasure, and of course the humble servants of the king in every thing, Hampden lost his cause. He roused, however, more effectually than ever, the attention of the people to this question, and means were not long wanting to check the king in his unfortunate career.

TROUBLES IN SCOTLAND.—THE NATIONAL COVENANT.

An attempt had been made by King James to introduce the Episcopal Church into Scotland, because it was thought dangerous to the English church that a form of worship, resembling that of the Puritans, should be permitted to exist in any part of the king's dominions. The same object was prosecuted with greater zeal by King Charles; and although the people were generally adverse to it, he had succeeded, after a visit which he paid to the country in 1633, in settling thirteen bishops over the church, by whom he hoped to govern the clergy as he did those of England. But when he attempted, in 1637, to introduce a new Book of Common Prayer into the Scotch churches, the spirit of the people could no longer be kept within bounds. On the Liturgy being opened in the principal church at Edinburgh, the congregation rose in a violent tumult, and threw their clasped Bibles, and the very stools they sat on, at the minister's head; and it was not till the whole were expelled by force, that the worship was permitted to proceed. It was found necessary, by the Scottish state-officers, to withdraw the obnoxious Liturgy, till they should consult the king, who, not dreading any mischief, gave orders that it should be used as he had formerly directed, and that the civil force should be employed in protecting the clergymen. It was found quite impossible to obey such an order in the face of a united people, who, by committees assembled at Edinburgh, representing the nobles, ministers, gentry, and burghers, endeavoured to awe the king into an abandonment of the late innovations. Charles endeavoured, by every means in his power, to avoid such a humiliation, which he believed would give immense force to the innovators in England. But the Scotch, when they found him hesitating, bound themselves (March, 1638), under a bond called the *National Covenant*, which was signed by nineteen-twentieths of the adult population, to resist their sovereign in every attempt he might make to bring in upon them the errors of Popery—for such they held to be the forms of worship and ecclesiastical government which Charles had lately imposed upon their church. The king sent his favourite Scotch counsellor, the Marquis of Hamilton, to treat with his northern subjects, but nothing would satisfy them but the calling of a General Assembly of the church, for the purpose of settling all disputes. Charles, though he saw that this was only an appeal to the heads of the party by which he had been opposed, consented to the proposal, for the purpose of gaining time, in order that he might make warlike preparations against his refractory people.

The Assembly met at Glasgow in November, and, as might have been expected, formally purified the church from all the late innovations, excommunicating the bishops, and declaring the government of the clergy to rest, as formerly, in the General Assembly, which consisted of a selection of two clergymen from each presbytery, with a mixture of lay elders, and nothing to control its proceedings but their interpretation of the will of the divine founder of the Christian religion. Early in the succeeding year, the king, with great difficulty, collected an army of 20,000 men, whom he led to the border of Scotland, for the purpose of reducing these despisers of his authority. The Scotch, however, strengthened by devotional feeling, and a certainty that the English, in general, were favourable to their cause, formed an army equal in number, which was placed under the command of General Alexander Leslie, an officer who had served with distinction in the long Protestant war carried on against the Emperor of Germany. The Scottish army was encamped on the top of Dunse Law, a hill overlooking the border, where the duties of military parade were mingled with prayers and preachings, such as were never before witnessed in a camp. The king, seeing the wavering of his own men, and the steadfastness of the Scotch, was obliged to open a negotiation, in which it was agreed to disband both armies, and to refer the disputes once more to a General Assembly and a Scottish Parliament.

The king now adopted a new policy with the turbulent people of Scotland. Having formerly gained over some of the English patriots, he thought he might be equally successful with the lords of the Covenant, whom he therefore invited to attend him at Berwick, where the late negotiations had been conducted. A few obeyed the summons; but he failed with all except the Earl (afterwards Marquis) of Montrose, a noble of vigorous genius, whose ambition had been wounded by not having so high a place in the counsels of his countrymen as he thought he deserved. In the new General Assembly and Parliament (1640), the votes were equally decisive against Episcopacy; and though Charles prorogued the latter body before it had completed its proceedings, it nevertheless continued sitting, and voted every measure which it thought necessary. The king collected a second army, and, in order to raise money for a second expedition against the Scots, was reduced to the necessity of calling an English Parliament, the first that had met for eleven years. It met (April 13), but, without listening for a moment to a request for subsidies, began to discuss the national grievances. Finding it quite intractable, the king dissolved it (May 5), and endeavoured to obtain supplies in other quarters. A convocation of the clergy granted him £20,000 per annum for the next three years. The nobility and gentry advanced £[illegible], but when the city of London was asked for a loan of £200,000, it absolutely refused.

The Scots did not, on this occasion, wait to be attacked by the king, but, in August, 1640, marched into the north of England, in the expectation of being sup-

ic their claims by the English people in general. A victory gained by them at Newburnford, and their taking possession of Newcastle, together with the manifest disaffection of his own troops, made it necessary that Charles should once more resort to negotiation. It was agreed at a council of peers that all the present dissensions should be referred to the Parliaments of the two countries, the Scottish army being in the mean time kept up on English pay, till such time as they were satisfied with the state of their affairs.

THE LONG PARLIAMENT.—THE IRISH REBELLION.

The English Parliament met in November, and immediately commenced a series of measures for effectually and permanently abridging the royal authority. There was even a party who, provoked by the late arbitrary measures, contemplated the total abolition of the monarchy, and the establishment of a republic. The first acts of the Parliament had little or no immediate reference to Scotland. The Earl of Strafford was impeached of treason against the liberties of the people, and executed (May 12, 1641), notwithstanding a solemn promise made to him by the king that he should never suffer in person or estate. Archbishop Laud was impeached and imprisoned, but reserved for future vengeance. The remaining ministers of the king only saved themselves by flight. Some of the judges were imprisoned and fined. The abolition of Episcopacy was taken into consideration. The Catholics fell under a severe persecution; and even the person of the queen, who belonged to this faith, was not considered safe.

It was not till August, 1641, when the English Parliament had gained many of its objects, that they permitted the treaty of peace with Scotland to be fully ratified. They then gratified the troops, not only with their full pay at the rate of £850 a day, but with a vote of no less a sum than £300,000 besides, of which £80,000 was paid down, as an indirect way of furnishing their party with the means of future resistance. The king, on his part, also took measures for gaining the attachment of this formidable body of soldiery, and of the Scottish nation in general. In Edinburgh, which he visited in August, he squared his conduct carefully with the rigour of Presbyterian manners. In the Parliament he was exceedingly complaisant; he readily ratified all the acts of the preceding irregular session; he yielded up the right of appointing the state officers of Scotland, and he ordained that the Scottish Parliament should meet once every three years without regard to his will—all of which were points of the greatest importance. The men who had acted most conspicuously against him in the late insurrections, now became his chief counsellors, and he seemed to bestow favours upon them exactly in proportion to their enmity. He created General Leslie Earl of Leven, putting on his coronet with his own hand. The Earl of Argyle, who had been the chief political leader of the Covenanters, was made a marquis. Many others received promotions in the peerage. The offices of state were distributed among them. Thus, it will be observed, the affections of the Scots were in a manner set up to auction between the king and his English Parliament, and from both did they receive considerable advantages.

But, while thus intriguing with the Covenanting leaders, Charles also kept up a correspondence with a royalist party which had been imbodied by the Earl of Montrose. This nobleman was now suffering confinement in Edinburgh Castle, for his exertions in favour of the king. An obscure conspiracy which he formed against three of the chief popular nobles, Argyle, Hamilton, and Lanark, as a preliminary step to the re-establishment of the royal power, became known at this time, and did some injury to the king's cause in both countries. After spending about three months in Edinburgh, Charles was suddenly called away in consequence of intelligence which reached him from Ireland.

The cruel policy already mentioned, by which large portions of Ireland were depopulated, and then planted with colonies of English and Scotch settlers, had been continued during the reign of Charles. In addition to this and other local causes of complaint, the state of religion was one which pervaded nearly the whole country, and was always becoming more and more important. Though the reformed faith had been established for nearly a century, it had made little progress except among the English settlers. The greater part of the nobility, and also of the lower orders, were still attached to the ancient creed; and a Catholic hierarchy, appointed by the Pope, and supported by the people, enjoyed as much respect and obedience as when that religion was countenanced by the state. The refusal of the Catholics to take the oath of supremacy, which acknowledged the king to possess a right which their faith taught them to belong to the Pope, necessarily excluded them from all branches of the public service. There were also penal laws against the profession of Catholicism, and a severe court of Star-Chamber to carry these into execution. Thus situated, the Irish Catholics had two strong motives to mutiny—a confidence in their numbers, and a constant sense of suffering under the government.

In 1633, the Earl of Strafford was appointed viceroy of Ireland. His government was vigorous, and those institutions which he thought proper to patronize, flourished under it; but his great aim was to make the king absolute, and he rather subdued than conciliated the popular spirit. When summoned in 1640 to attend the king in England, he left the Irish government in the hands of Sir William Parsons and Sir John Borlase, as lords justices. Immediately after his departure, the spirit which he thought he had quelled began to re-appear, being encouraged both by his absence, and by the success which the Scottish Covenanters had experienced in a war against religious restraint. A conspiracy, involving most of the country without the Pale, and including many persons within it, was formed chiefly under the direction of a gentleman named Roger Moore, who possessed many qualities calculated to endear him to the people. Some circumstances excited the suspicion of the Protestants; and, among others, the return of several officers who had been in the service of the King of Spain, under pretence of recruiting for the Spanish army. But the apparent tranquillity of the country baffled all scrutiny.

The 23d of October, 1641, being a market-day, was fixed on for the capture of Dublin Castle. During the previous day, nothing had occurred to alarm the authorities. In the evening of the 22d, the conspiracy was accidentally discovered, and measures were taken to save Dublin; but a civil war raged next morning in Ulster and speedily spread over the country. The design of Sir Phelim O'Neill, and the other leaders of the insurrection, was simply political. They conceived the time a good one for striking a blow against the government, as the Scots had done; and their conduct was in the outset characterized by lenity. They could not, however, allay the hatred with which the Catholics looked upon their adversaries; and a spirit of revenge broke out among their followers, which was aggravated to cruel outrage, when they heard that the conspiracy was discovered in Dublin. The spirit of retaliation was let loose, and political wrongs, unfeelingly inflicted, were, as is often the case, ferociously avenged. The massacre of an immense number of Protestants held forth an awful lesson of the effects which oppressive laws produce on the human passions. The government rather aggravated than alleviated the evil, by offering the estates of all in rebellion to those who should aid in reducing them to obedience. This drove the insurgents to desperation,

and postponed the complete extinction of the war for several years. It is to be remarked, that, though the Irish were struggling for both national and religious freedom, they gained no sympathy from the patriots of Britain, who, on the contrary, urged the king to suppress the rebellion, being afraid that a religious toleration in Ireland would be inconsistent with the same privilege in their own country. The Scottish Covenanters, themselves so recently emancipated from a restraint upon their consciences, contributed ten thousand troops to assist in restoring that restraint upon the Irish.

THE CIVIL WAR.

It was generally allowed by moderate people, that in the autumn of 1641, at which time the labours of the Parliament had continued one year, the king had granted redress of all the abuses for which the earlier part of his reign, and the British constitution in general, were blamable. Unfortunately, the character of the king for fidelity to his engagements was not sufficiently high to induce the leaders of the House of Commons to depend upon him: they feared that, if they once permitted him to resume his authority, there would be no longer any safety for them; and they deemed it necessary that things should be prevented from falling into their usual current. They therefore prepared a paper called *The Remonstrance*, containing an elaborate view of all the grievances that had ever existed, or could now be supposed to exist; and this they not only presented to the king, but disseminated widely among the people, with whom it served to increase the prevailing disaffection.

From this time it was seen that the sword could alone decide the quarrel between the king and the Parliament. Charles made an unsuccessful attempt (January 4, 1642) to seize six of the most refractory members, for the purpose of striking terror into the rest. This served to widen the breach. In the early part of 1642, the two parties severally employed themselves in preparing for war. Yet, even now, the king granted some additional concessions to his opponents. It was at last, upon a demand of the Parliament for the command of the army—a privilege always before and since resting with the crown—that he finally broke off all amicable intercourse. He retired with his family to York.

The Parliament found its chief support in the mercantile classes of London and of the eastern coast of England, which was then more devoted to trade than the west, and in the Puritan party generally, who were allied intimately with the Presbyterians of Scotland, if not rapidly becoming assimilated with them. Charles, on the other hand, looked for aid to the nobility and gentry, who were able to bring a considerable number of dependants into the field. The Parliamentary party was by the other styled *Roundheads*, in consequence of their wearing short hair; while the friends of the Parliament bestowed upon their opponents the epithet of *Malignants*. The Royalists were also, in the field, termed Cavaliers, from so many of them being horsemen.

On the 25th of August, the king erected his standard at Nottingham, and soon found himself at the head of an army of ten thousand men. The Parliament had superior forces, and a better supply of arms; but both parties were very ignorant of the art of war. The king commanded his own army in person, and the Parliamentary forces were put under the charge of the Earl of Essex.

The first battle took place, October 23, at Edgehill, in Warwickshire, where the king had rather the advantage, though at the expense of a great number of men. He gained some further triumphs before the end of the campaign, but still could not muster so large an army as the Parliament. During the winter, the parties opened a negotiation at Oxford; but the demands of the Parliament being still deemed too great by the king, it came to no successful issue.

Early in the ensuing season, the king gained some considerable advantages; he defeated a Parliamentary army under Sir William Waller at Stratton, and soon after took the city of Bristol. It only remained for him to take Gloucester, in order to confine the insurrection entirely to the eastern provinces. It was even thought at this time that he might have easily obtained possession of London, and thereby put an end to the war. Instead of making such an attempt, he caused siege to be laid to Gloucester, which the army of Essex relieved, when it was just on the point of capitulating. As the Parliamentary army was returning to London, it was attacked by the royal forces at Newbury, and all but defeated. Another royal army in the north, under the Marquis of Newcastle, gained some advantages; and, upon the whole, at the close of the campaign of 1643, the Parliamentary cause was not in a flourishing condition.

In this war, there was hardly any respectable military quality exhibited, besides courage. The Royalists used to rush upon the enemy opposed to them, without any other design than to cut down as many as possible, and, when any part of the army was successful, it never returned to the field while a single enemy remained to be pursued; the consequence of which was, that one wing was sometimes victorious, while the remainder was completely beaten. The Parliamentary troops, though animated by an enthusiastic feeling of religion, were somewhat steadier, but nevertheless had no extensive or combined plan of military operations. The first appearance of a superior kind of discipline was exhibited in a regiment of horse commanded by Oliver Cromwell, a gentleman of small fortune, who had been a brewer, but was destined, by great talent, hypocrisy, and address, joined to an unrelenting disposition, to rise to supreme authority. Cromwell, though himself inexperienced in military affairs, showed, from the very first, a power of drilling and managing troops, which no other man in either army seemed to possess. Hence his regiment soon became famous for its exploits.

The royal successes of 1643 distressed alike the English Parliament and the Scottish nation, who now began to fear the loss of all the political meliorations they had wrested from the king. The two parliaments therefore entered, in July, into a *Solemn League and Covenant*, for prosecuting the war in concert, with the view of ultimately settling both church and state in a manner consistent with the liberties of the people. In terms of this bond, the Scots raised an army of 21,000 men, who entered England in January, 1644, and, on the 1st of July, in company with a large body of English forces, overthrew the king's northern army on Long Marston Moor. The conduct of the Scottish nation in this transaction was not unexceptionable. They had been gratified in 1641 with a redress of every grievance they could name; since which time the king had not given them the least cause of complaint. In now raising war against him, they had no excuse but the very equivocal one, that it was necessary to guard against the possibility of his afterwards being able to injure them. They were also acting on English pay, a proceeding not very consistent with their pretensions to independence. The mainspring of their policy was a hope of being able to establish the Presbyterian religion in England. The Episcopal church being now abolished, divines were nominated by both nations to meet at Westminster, in order to settle a new form of worship and church government; and after a long course of deliberation it was agreed that the Presbyterian system should be adopted, though in England it was provided that the new church should have no connection with or influence over the state.

ne defeat at Long Marston was severely felt by the king. He gained victory over Waller at Copredy bridge, and caused Essex's army to capitulate in Cornwall (September 1), but in consequence of a second fight at Newbury (October 27), in which he suffered a defeat, he was left at the end of the campaign with greatly diminished resources. A new negotiation was commenced at Uxbridge; but the terms asked by the Parliament were so exorbitant as to show no sincere desire of ending the war. In truth, though the Presbyterian party were perhaps anxious for peace, there was another party, now fast rising into importance, who had no such wishes. These were the Independents, a body of men who wished to see a republic established in the state, and all formalities whatever removed from the national religion. Among the leaders of the party was Cromwell, whose mind seems to have already become inspired with lofty views of personal aggrandizement. This extraordinary man had sufficient address to carry a famous act called the *Self-Denying Ordinance*, which ostensibly aimed at depriving all members of the legislature of commands in the army, but had the effect only of displacing a few noblemen who were obnoxious to his designs. He also carried an act for modelling the army anew, in which process he took care that all who might be expected to oppose his views should be excluded. It was this party, more particularly, that prevented any accommodation taking place between the king and his subjects.

While the negotiation was pending, the Marquis (formerly Earl) of Montrose produced a diversion in Scotland in favour of the king. Having got fifteen hundred foot from Ireland, to which he added a few Perthshire Highlanders, he descended upon the Lowlands, and on the 1st of September (1644) gained a complete victory over a larger and better-armed force at Tippermuir. At Aberdeen, whither he went for the purpose of increasing his army, he gained another victory over a superior body of Covenanters. He was then pursued by a third army, under the Marquis of Argyle, and, after some rapid movements, seemed to dissolve his forces in the Highlands. Ere his enemies were aware, he burst in the middle of winter into the country of his great rival Argyle, which he did not leave till he had made it a desert. Finding himself timidly followed by the marquis, at the head of a large body of the clan Campbell, he turned suddenly, and falling upon them at Inverlochy (February 2, 1645), gained a complete victory. He then moved along the eastern frontier of the Highlands, where he found himself opposed by a fourth army under General Baillie. After sacking Dundee, and eluding Baillie's troops, he encountered at Aldearn, in Nairnshire (May 4), a greatly superior force, which he also overthrew. Then turning upon Baillie, whom he met at Alford, in Aberdeenshire (July 2), he gained a fifth victory, almost as complete as any of the rest.

In all these battles Montrose carried every thing before him by the spirit of his first onset, and the slaughter was in general very great. He now descended to the Lowlands, and at Kilsyth, near Glasgow, was opposed by an army of 6000 men, whom the insurgent government at Edinburgh had hastily assembled from Fife and Perthshire. These, with a much smaller force, he also defeated (August 15), killing great numbers in the pursuit. The committees of church and state then broke up and left the kingdom, leaving him in appearance its sole master. His successes had in the mean time given the king hopes of carrying on the war with success; but Montrose had in reality gained no sure advantages. Besides his small army of mingled Irish and Highlanders, there was hardly any portion of the nation who did not regard him as only a great public enemy. While lying with a diminished force at Philiphaugh, near Selkirk, he was surprised (September 11), by a detachment of the regular Scottish army, under General David Leslie, who completely defeated his troops, and obliged him to leave the kingdom. His having gained six victories in succession, over larger bodies of men, has procured for him a distinguished name; but his cruelty, and the ambition to which his motives were confined, detract greatly from his character.

FROM THE YEAR 1645 TILL THE PEACE OF 1763.

CONCLUSION OF THE CIVIL WAR.

The English campaign of 1645 ended in the complete overthrow of the king. Throughout the war, his enemies had been continually improving in discipline, in conduct, and in that enthusiasm which animated them so largely, while the royalists had become, out of a mere principle of opposition, so extremely licentious as to be rather a terror to their friends than to their enemies. The new-modelling of the parliamentary army, which took place early in 1645, had also added much to the effectiveness of the troops, who were now nominally commanded by Sir Thomas Fairfax, but in reality by Oliver Cromwell, who bore the rank of lieutenant-general. The consequence was, that, in a pitched battle at Naseby (June 14), the king was so completely beaten, that he and his party could no longer keep the field. He had no resource but to retire into Oxford, a town zealously affected to his cause, and well fortified.

He endeavoured, from this forlorn position, to renew the negotiations for a peace; but every attempt of that kind was frustrated by the Independents, who, though a minority in the House of Commons, possessed great power through the army, and, as already mentioned, were desirous of effecting greater changes in church and state than those for which the war was originally undertaken. Dreading the influence of this body, Charles retired privately from Oxford (May 1646) on the approach of the parliamentary forces, and put himself under the protection of the Scottish army at Newark.

As the views of the Scots throughout the war had been steadily confined to the security of the Presbyterian religion, along with the safety of the king's person and the establishment of a limited monarchy, they received him with great respect at their camp, and entered into negotiations for effecting their grand object. If Charles would have acceded to their views, he might have immediately resumed a great part of his former power; and the agitations of many subsequent years, as well as his own life, might have been spared. But this was forbidden, not only by his strong prepossession in favour of the Episcopal forms of worship, but also by his conviction, that the Episcopal form of church government was alone compatible with the existence of monarchy. He therefore disagreed with the Presbyterians on the very point which they considered the most important.

From the time when Charles first threw himself into the Scottish camp, the English Parliament had made repeated and strenuous demands for the surrender of his person into their hands. The Scots, however, though acting partly as a mercenary army, asserted their right, as an independent nation under the authority of the king, to retain and protect him. At length, despairing of inducing him to sanction the Presbyterian forms, and tempted by the sum of £400,000, which was given to them as a compensation for their arrears of pay, they consented to deliver up their monarch, but certainly without any apprehension of his life being in danger, and, indeed, to a party quite different from that by which he afterwards suffered. The Scottish army then retired (January 1647) to their native country, and were dismissed.

The king was now placed in Holdenby Castle, and negotiations were opened for restoring him to power, under

certain restrictions. While these were pending, the Parliament deemed it unnecessary to keep up the army, more especially as its spirit was plainly observed to be of a dangerous character. On attempting, however, to dismiss this powerful force, the English Commons found that their late servants were become their masters. The troops began to hold something like a Parliament in their own camp; a party of them, under Cornet Joyce, seized the king's person, and brought him to Hampton Court. Cromwell, who was at the bottom of their machinations, received from them the chief command; and, at his instigation, they retorted upon the Parliament with a demand for the dismissal of the leaders of the Presbyterian party, and a general right of new-modelling the government and settling the nation. The House of Commons, supported by the city of London, made a bold opposition to these demands, but was obliged to yield to a force which it had no means of resisting. From that time military violence exercised an almost uncontrolled mastery over England.

TRIAL AND EXECUTION OF THE KING.

The leaders of the army, being anxious to fortify themselves by all possible means against the Presbyterians, opened a negotiation with the king, whose influence, such as it now was, they proposed to purchase, by allowing Episcopacy to be the state religion, and leaving him in command of the militia. Charles, however, with characteristic insincerity, carried on at the same time a negotiation with the Presbyterians, which, being discovered by the military chiefs, caused them to break off all terms with him. Under dread of their resentment, he made his escape from Hampton Court (November 11, 1647), and, after an unsuccessful attempt to leave the kingdom, was obliged to put himself under the charge of the governor of Carisbrooke Castle, in the Isle of Wight. Here he entered upon a new negotiation with the House of Commons, to whom he made proposals, and from whom he received proposals in return; all of which were, however, rendered vain by a secret treaty which he at the same time carried on with a moderate party of the Scottish Presbyterians.

He finally agreed with the latter party, but under strict secrecy, to give their form of church government a trial of three years, and yield to them in several other points; they, in return, binding themselves to unite their strength with the English Royalists, for the purpose of putting down the Independent party, now predominant in the English Parliament. With some difficulty the Duke of Hamilton and others, who conducted this negotiation, succeeded, by a vote of the Scottish Parliament, in raising an army of 12,000 men, with which they invaded England in the summer of 1648. The more zealous of the clergy and people of Scotland protested against an enterprise, which, from its co-operating with Royalists and Episcopalians, and not perfectly ensuring the ascendency of the Presbyterian Church, appeared to them as neither deserving of success nor likely to command it. As the Scottish army penetrated the western counties, parties of Presbyterians and Royalists rose in different parts of England, and for some time the ascendency of the Independents seemed to be in considerable peril. But before the forces of the enemy could be brought together, Cromwell, with 8000 veteran troops, attacked and overthrew Hamilton at Preston, while Fairfax put down the insurgents in Kent and Essex. Hamilton was himself taken prisoner, and very few of his troops ever returned to their own country.

While Cromwell was employed in suppressing this insurrection, and in restoring a friendly government in Scotland, the Presbyterians of the House of Commons, relieved from military intimidation, entered upon a new negotiation with Charles, which was drawing towards what appeared a successful conclusion—though the king secretly designed to deceive them, and to pursue such means for an effectual restoration—when the army returned to London, breathing vengeance against him for this last war, of which they considered him as the author. Finding the Parliament in the act of voting his concessions to be satisfactory, Cromwell sent two regiments under Colonel Pride, who forcibly excluded from it about two hundred members of the Presbyterian party; a transaction remembered by the epithet of *Pride's Purge*. The remainder, being chiefly Independents, were ready to give a colour of law to whatever further measure might be dictated by the military leaders. Convinced of the utter faithlessness of the king, and that, if he continued to live, he would take the earliest opportunity of revenging himself for what had already been done, Cromwell and his associates resolved to put him to death. A High Court of Justice, as it was called, was appointed by ordinance, consisting of a hundred and thirty-three persons, named indifferently from the Parliament, the army, and such of the citizens as were known to be well affected to the Independent party. This body sat down in Westminster Hall (January 20, 1649), under the presidency of a barrister named Bradshaw, while another named Coke acted as solicitor for the people of England. Charles, who had been removed to St. James's Palace, was brought before this court, and accused of having waged and renewed war upon his people, and of having attempted to establish tyranny in place of the limited regal power with which he had been intrusted. He denied the authority of the court, and protested against the whole of the proceedings, but was nevertheless found guilty and condemned to die. On the 30th of January, he was accordingly beheaded in front of his palace of Whitehall. The people were in general horror-struck at this event; but they were too effectually kept in check by the army to have any influence in preventing it.

Charles I. was a man of slender person, of the middle size, and of a grave and somewhat melancholy cast of countenance. He had not a gracious manner, but possessed considerable dignity. He was sincerely attached to the Church of England, for which he might be considered as a martyr, and he was able to reason very acutely in favour of the divine origin of Episcopacy. The general opinion of modern times respecting his political conduct is unfavourable; though few deny that his death was a most disgraceful as well as imprudent act, on the part of those who brought it about. The worst point of his character was his insincerity; he was prone to using equivocations, with a view to deceive his opponents, and therefore no enemy could depend upon him in negotiation. In private life he was a virtuous man, and he is entitled to much credit for the taste which he displayed in the encouragement of the fine arts. He left three sons—Charles, Prince of Wales; James, Duke of York, afterwards James II.; and Henry, Duke of Gloucester, who died in early life. He also left several daughters, one of whom, named Elizabeth, was treated with much harshness by the new government, and died not long after him in prison.

In the reign of Charles I., the chief literary men were Ben Johnson and Philip Massinger, dramatists, and Samuel Daniel, Michael Drayton, and William Drummond, poets. The most eminent philosophical character was Dr. William Harvey, who discovered the circulation of the blood. Elegant architecture was now for the first time introduced into private buildings. The king patronized the Dutch artists, Rubens and Vandyke, and collected many fine pictures, which were afterwards sold by his enemies. The excise and the tax upon landed property were introduced by the Parliament, in order to support the war against the king. When the Parliamentary party became triumphant, it suppressed the theatre, which was not again set up till the restoration of monarchy.

THE COMMONWEALTH—SUBJUGATION OF IRELAND AND SCOTLAND.

Though the execution of the king produced a considerable reaction in favour of royalty, the small remaining part of the House of Commons, which got the ridiculous nickname of the *Rump*, now established a republic, under the title of the Commonwealth, the executive being trusted, under great limitations, to a council of forty-one members, while in reality Cromwell possessed the chief influence. The House of Peers was voted a grievance, and abolished, and the people were declared to be the legitimate source of all power. Soon after the king's death, the Duke of Hamilton, and a few other of his chief adherents, were executed.

During the progress of the civil war, Ireland had been the scene of almost ceaseless contention among the various parties of the King, the English House of Commons, and the Catholics, none of which could effectually suppress the rest. The most remarkable event was a secret agreement which Charles made, in 1646, with the Earl of Glamorgan, to establish the Catholic religion in Ireland, on condition that its partisans should assist him in putting down his enemies in England and Scotland; a transaction which ultimately injured his reputation, without leading to any solid advantage. At the time of his execution, the Royalists were in considerable strength under the Duke of Ormond, while Hugh O'Neill was at the head of a large party of Catholics, who were not indisposed to join the other party, provided they could be assured of the establishment of their religion. While the two parties in union could have easily rescued the country from the English connection, Cromwell landed (August 1649) with 12,000 horse and foot, and, in a series of victories over the scattered forces of his various opponents, succeeded without any great difficulty in asserting the sway of the Commonwealth. One of his most important actions was the capture of Drogheda, where he put the garrison and a number of Catholic priests to the sword, in order to strike terror into the nation.

The people of Scotland, who had had scarcely any other object in the civil war than the establishment of their favourite form of worship, and were sincere friends to a limited monarchy, heard of the death of the king with the greatest indignation, and immediately proclaimed his eldest son Charles. Early in 1650, the young monarch, who had taken refuge in Holland, sent Montrose with a small force to attempt a Cavalier insurrection in Scotland; but this nobleman being taken and put to death, Charles found it necessary to accede to the views of the Scots respecting the Presbyterian religion, and he was accordingly brought over and put at the head of a considerable army, though under great restrictions. Cromwell, who had now nearly completed the conquest of Ireland, lost no time in returning to London, and organizing an army for the suppression of this new attempt against the Commonwealth.

On the 19th of July he crossed the Tweed, and advanced through a deserted country to Edinburgh, where the Scottish army lay in a fortified camp. Sickness in the army, and the want of provisions, soon after compelled him to retreat; and the Scottish army, following upon his rear, brought him into a straitened position near Dunbar, where he would soon have been under the necessity of surrendering. In the midst of his perplexities (September 3), he beheld the Scots advancing from the neighbouring heights to give him battle, and in a transport of joy, exclaimed, "The Lord hath delivered them into our hands!" This movement was solely the result of interference on the part of the clergy who followed the Scottish camp: the better sense of General Leslie would have waited for the voluntary surrender of his enemy. In the fight which ensued, the veteran troops of Cromwell soon proved victorious. The Scots fled in a panic, and were cut down in thousands by their pursuers. This gained for Cromwell the possession of the capital and of all the south-east provinces; but the Covenanters still made a strong appearance at Stirling.

Cromwell spent a whole year in the country, vainly endeavouring to bring on another action. During the interval (January 1, 1651), the Scots crowned the young king at Scone, part of the ceremony consisting in his acceptance of the Solemn League and Covenant. In the ensuing summer, Cromwell at length contrived to outflank the position of the Scottish army; but the result was, that Charles led his troops into England without opposition, and made a very threatening advance upon the capital. Ere the Royalists had time to rally around him, Cromwell overtook the king at Worcester, where after a stoutly contested fight (September 3, 1651), he proved completely victorious. Charles, with great difficulty, escaped abroad, and Scotland, no longer possessed of a military force to defend itself, submitted to the conqueror. All the courts of the Scottish church were suppressed, and the ministers were left no privilege but that of preaching to their flocks. The country was kept in check by a small army under General Monk, and in a short time was declared by proclamation to be united with England. Thus was the Independent party, or rather Cromwell, left without a single armed enemy. All the efforts of the people during twelve years to obtain limitations upon the monarchy, had ended in a military despotism.

THE PROTECTORATE.

After the country and its dependencies had been thoroughly settled under the new government, the republican leaders resolved upon commencing hostilities against Holland, which, during the civil war, had manifested a decided leaning towards the king, and had recently treated the triumphant party with marked disrespect. In the summer of 1652, the Dutch fleet, under its famous commanders, Van Tromp, De Ruyter, and De Witt, had several encounters with the English ships, under Admirals Blake and Ayscue, without any decided success on either side. But, in the ensuing spring, an action was fought between Blake and Van Tromp, in which the latter lost eleven ships. The Dutch then sued for peace, which the Rump Parliament, for various reasons, were little inclined to grant. Their principal motive for prosecuting the war, was a conviction that it tended to restrict the power of Cromwell, to whom they now paid by no means a willing obedience. Cromwell, perceiving their design, proceeded with 300 soldiers to the house (April, 1653), and entering with marks of the most violent indignation, loaded the members with reproaches for their robbery and oppression of the public; then, stamping with his foot, he gave signal for the soldiers to enter, and, addressing himself to the members, "For shame!" said he; "get you gone! give place to honester men! I tell you you are no longer a Parliament; the Lord hath done with you!" He then commanded "that bauble," meaning the mace, to be taken away, turned out the members, and, locking the door, returned to Whitehall with the key in his pocket.

Being still willing to keep up the appearance of a representative government, Cromwell summoned one hundred and forty-four persons in England, Ireland, and Scotland, to assemble as a parliament. These individuals, chiefly remarkable for fanaticism and ignorance, were denominated the *Barebones Parliament*, from the name of one of the members, a leather-seller, whose assumed name, by a ridiculous usage of the age, was Praise-God Barebones. As the assembly obtained no public respect, Cromwell took an early opportunity of dismissing it. His officers then constituted him PROTECTOR of the Com

monwealth of Great Britain and Ireland, with most of the prerogatives of the late king.

The war against Holland was still carried on with great spirit. In the summer of 1653, two naval actions, in which both parties fought with the utmost bravery, terminated in the triumph of the English, and the complete humiliation of the Dutch, who obtained peace on the condition of paying homage to the English flag, expelling the young king from their dominions, and paying a compensation for certain losses to the East India Company. In a war which he subsequently made against Spain, the fleets of the protector performed some exploits of not less importance. The respect which he thus gained for the English name throughout Europe, is one of the brightest points in his singular history. But while generally successful abroad, he experienced unceasing difficulties in the management of affairs at home. Of the various parliaments which he summoned, no one was found so carefully composed of his own creatures as to yield readily to his will: he was obliged to dissolve them all in succession, after a short trial. He also experienced great difficulty in raising money, and sometimes applied for loans in the city without success. His own officers could scarcely be kept in subordination, but were constantly plotting a reduction of his authority. The Royalists, on the other hand, never ceased to conspire for his destruction; one, named Colonel Titus, went so far as to recommend his assassination in a pamphlet entitled "Killing no Murder," after reading which he was never seen again to smile.

The last Parliament called by Cromwell was in January, 1656; when, besides the commons, he summoned the few remaining peers, and endeavoured, by ennobling some of his officers, to make up a kind of Upper House. This assembly proved as intractable as its predecessors, and he contracted such a disgust at the very nature of a representative legislature, as to resolve, like Charles I., never to call another. His health finally sank under the effects of his ill-gotten power, and he died on the 3d September, 1658, a day which was thought to be propitious to him, as it was the anniversary of several of his victories. His eldest son Richard, a weak young man, succeeded him as protector, and was at first treated with all imaginable respect; but he could not long maintain a rule which even his father had ultimately failed in asserting. He quietly slunk out of public view, leaving the supreme authority in the hands of the Rump, which had taken the opportunity to re-assemble.

THE RESTORATION.—DUTCH WAR.

This remnant of an old Parliament continued in power till the autumn of 1659, when it gave way to a council of the officers who had been in command under Cromwell. The latter government, in its turn, yielded to the Rump, which sat down once more in December. The people, finding themselves made the sport of a few ambitious adventurers, began to long for some more fixed and respectable kind of government. At this crisis, General Monk, commander of the forces in Scotland, conceived the design of settling the nation. He left Scotland (January 2, 1660), with a considerable army; and though he kept his thoughts scrupulously to himself, all men bent their eyes upon him, as a person destined to realize their hopes. He reached London (February 3), and was received with feigned respect by the Rump. Some resistance was attempted by Lambert, one of Cromwell's officers, but in vain. Ere long, Monk was able to procure the restoration of the members who had been excluded from Parliament by Cromwell; who, being a majority, gave an immediate ascendency to anti-republican views. As soon as this was effected, an act was passed for calling a new and freely elected Parliament; after which, the existing assembly immediately dissolved itself.

The new Parliament proved to be chiefly composed of Cavaliers and Presbyterians, men agreeing in their attachment to monarchy, though differing in many other views. After some cautious procedure, in which the fears inspired by the late military tyranny were conspicuous, they agreed to invite the king from his retirement in Holland, and to restore him to the throne lost by his father. They were so glad to escape from the existing disorders, that they never thought of making any preliminary arrangement with the king as to the extent of his prerogative. On the 29th of May, being his thirtieth birthday, Charles II. entered London amidst such frantic demonstrations of joy, that he could not help thinking it his own fault, as he said, that he had been so long separated from his people.

One of the first measures of the new monarch was the passing of a bill of indemnity, by which all persons concerned in the late popular movements were pardoned, excepting a few who had been prominently concerned in bringing the king to the block: Harrison, Scrope, and a few other regicides, were tried and executed; and the bodies of Cromwell, Ireton, and Bradshaw, were raised from the grave and exhibited upon gibbets. In Scotland only three persons suffered—the Marquis of Argyle, Johnston of Warriston, and Mr. Guthry, a clergyman: it was considered remarkable, that the marquis had placed the crown upon the king's head at Scone in the year 1651. Excepting in these acts, the king showed no desire of revenging the death of his father, or his own exclusion from the throne. The Parliament which called him home was constituted a legal one by his own ratification of an act for that purpose. In the settlement of other matters, it seemed the prevailing wish that all the institutions of the country should be made as nearly what they were before the civil war as possible. Thus the Episcopal Church was established both in England and Scotland, though not without causing about a third of the clergy in both countries to resign their charges. The stern and enthusiastic piety which prevailed during the civil war, was now treated with ridicule, and the most of the people vied with each other in that licentious riot and drunkenness which is condemned by all systems of faith. The nation, in fact, seemed intoxicated with the safety which they supposed themselves to have at length gained in a restoration to the imperfect freedom they enjoyed before the civil war.

Ireland, which, during the Protectorate, had been managed by Henry, a younger son of Cromwell, acceded to the Restoration with as much readiness as any other part of the British dominions. An act was passed for settling property, by which the Catholics obtained some slight benefits, but which, in its main effects, confirmed the rights of the settlers introduced by Cromwell.

Though Charles had been restored with the approbation of a very large portion of his subjects, his most zealous friends were the Royalists and Episcopalians; hence he almost immediately subsided into the character of a party ruler. It was deemed necessary that he should maintain an armed force for the protection of his person, and to keep down popular disturbances. He therefore caused several horse regiments to be imbodied under the name of Life Guards, being chiefly composed of Royalist gentlemen upon whom a perfect dependence could be placed; and he afterwards added two or three foot regiments, the whole amounting to about five thousand men. The king paid these troops chiefly out of the money allowed for his own support, for Parliament did not sanction his keeping up such a force, and the nation generally beheld it with suspicion. This was the commencement of a *standing army* in England.

Personally indolent, dissolute, and deficient in conscientiousness, and surrounded almost exclusively by ministers of the basest pleasures, Charles was not qualified to retain the sincere respect of a people whose

tual character is grave and virtuous. His extravagant expenditure soon cooled the affections of his Parliament, and he began to find considerable difficulties in obtaining money. To relieve himself from this embarrassment, he accepted £40,000 from the French king for Dunkirk, a French port which had been acquired by Cromwell. For the same purpose, he married a Portuguese princess of the Catholic religion, who possessed a dowry of half a million. He also commenced (1664) a war against Holland, for apparently no better reason than that, in applying the Parliamentary subsidies necessary for keeping up hostilities, he might have an opportunity of converting part of the money to his own personal use.

The Dutch war was chiefly conducted by sea. On the 3d of June, 1665, an English fleet of 114 sail met a Dutch one which numbered just one ship less, near Lowestoffe, and after an obstinate fight gained a complete victory, depriving the enemy of eighteen vessels, and compelling the rest to take refuge on their own coast. The commander on this occasion was the Duke of York, the king's younger brother; a man of greater application and more steady principles, but who soon after became unpopular, in consequence of his avowing himself a Catholic.

Some other well-contested actions took place at sea, and the English, upon the whole, confirmed their naval supremacy. Owing, however, to a failure of the supplies, the king was obliged to lay up his best vessels in ordinary, and to send only an inferior force to sea. The Dutch took advantage of this occurrence to send a fleet up the Thames (June 10, 1667), which, meeting with no adequate resistance, threatened to lay the capital in ruins and destroy its shipping. Fortunately, the Dutch admiral did not think it expedient to make this attempt, but retired with the ebb of the tide, after having sunk and burnt nearly twenty vessels, and done much other damage. The king, finding himself rather impoverished than enriched by the war, soon after concluded a peace.

PLAGUE AND FIRE OF LONDON.—PERSECUTION IN SCOTLAND.

In the mean time, two extraordinary calamities had befallen the metropolis. In the summer of 1665, London was visited by a plague, which swept off about 100,000 people, and did not experience any abatement till the approach of cold weather. On this occasion the city presented a wide and heart-rending scene of misery and desolation. Rows of houses stood tenantless, and open to the winds; the chief thoroughfares were overgrown with grass. The few individuals who ventured abroad, walked in the middle of the streets, and, when they met, declined on opposite sides, to avoid the contact of each other. At one moment were heard the ravings of delirium, or the wail of sorrow, from the infected dwelling; at another, the merry song or careless laugh from the tavern, where men were seeking to drown in debauchery all sense of their awful situation. Since 1665, the plague has not again occurred in London, or in any other part of the kingdom.

The second calamity was a conflagration, which commenced on the night of Sunday the 2d of September, 1666, in the eastern and more crowded part of the city. The direction and violence of the wind, the combustible nature of the houses, and the defective arrangements of that age for extinguishing fires, combined to favour the progress of the flames, which raged during the whole of the week, and burnt all that part of the city which lies between the Tower and the Temple. By this calamity, 13,200 houses and 89 churches, covering in all 430 acres of ground, were destroyed. The flame at one time formed a column a mile in diameter, and seemed to mingle with the clouds. It rendered the night as clear as day for ten miles around the city, and is said to have produced an effect upon the sky which was observed on the borders of Scotland. It had one good effect, in causing the streets to be formed much wider than before, by which the city was rendered more healthy. By the populace, this fire was believed to have been the work of the Catholics, and a tall pillar, with an inscription to that effect, was reared in the city, as a monument of the calamity. This pillar with its inscription still exists; but the fire is now believed to have been occasioned purely by accident.

Meanwhile, in Scotland great dissatisfaction had been occasioned by the imposition of Episcopacy upon the church, and advantage had been taken of various acts of resistance on the part of the clergy and people, to visit both with measures of considerable severity. Heavy fines were imposed upon such as failed to attend the ministrations of the established clergy, on the suspicion that, when not at church, they were hearing the ejected clergymen in some private place. A small standing army was kept up to enforce the fines, and, till these were paid, free quarters were exacted for the soldiers. Tired of suffering, a few of the peasantry of Galloway rose in rebellion (November, 1666), and, advancing through the disaffected districts of Ayrshire and Lanarkshire, gradually assumed a threatening appearance. An unfortunate movement towards Edinburgh, where they expected accessions, thinned their numbers, and they were overpowered by General Dalyell at the Pentland Hills. Thirty-four of the prisoners were executed as rebels, chiefly at the instigation of Sharpe, Archbishop of St. Andrews, who, with the other prelates, was peculiarly zealous in behalf of the government. Besides these sufferers, fifty persons, including fifteen clergymen, forfeited lands and goods.

Some attempts were now made, at the desire of the king, to induce the ejected clergy to connect themselves with the church; but very few took advantage of a leniency which they believed would have been extended also to Catholics, and which involved their acknowledgment of the king's supremacy in spiritual affairs. About the year 1670, some divines began to hold conventicles in secluded parts of the country, to which the country people used to come with arms. At these places, a far warmer kind of devotion was felt, than could be experienced under tamer circumstances; and, as may be supposed, such meetings were not calculated to diffuse or foster a sentiment of loyalty. Sensible of this, the government obtained an act, imposing very severe fines on all who should preach or listen at conventicles; but without producing any effect. The penalties with which they were threatened seemed only to make the people more attached to their peculiar modes of worship and church government.

THE TRIPLE ALLIANCE.—THE FRENCH ALLIANCE.

The kingdom of France was at this period, under Louis XIV., rising into a degree of power and wealth which it had never before known. Louis had some claims through his wife upon the Netherlands (since called Belgium), which were then part of the Spanish dominions. He accordingly endeavoured to possess himself of that country by force of arms. A jealousy of his increasing power, and of the Catholic religion, professed by his people, induced the English to wish that his aggressions should be restrained. To gratify them, Charles entered into an alliance with Holland and Sweden, for the purpose of checking the progress of the French king. In this object he was completely successful, and consequently he became very popular. The Parliament, however, having disappointed him of supplies, he soon after entirely changed his policy, and, with the assistance of five abandoned ministers, Clifford, Ashley, Buckingham, Arlington, and Lauderdale, who were called the CABAL, from the initials of their names forming that word, resolved to render himself, if possible, independent of Parliament; in other words, an absolute

prince. In consideration of a large bribe from Louis, he agreed to join France in a war against Holland, with a view of putting an end to that example of a Protestant republic.

War was accordingly declared in May, 1672, and the naval force of England was employed in meeting that of the Dutch by sea; while Louis led a powerful army across the Rhine, and in a very short time had nearly reduced the whole of the Seven Provinces. In this emergency, the Dutch could only save themselves from absolute ruin by laying a great part of their country under water. The English, who had not entered heartily into this war, soon began to be alarmed for the fate of Holland, which was almost their only support against the dread of Popery; and though forbidden under severe penalties to censure the government measures, they soon contrived to exhibit so much dissatisfaction, as to render a change of policy unavoidable.

The king found it necessary to assemble his Parliament (February, 1673), and it was no sooner met, than it passed some acts highly unfavourable to his designs. Among these was the famous Test Act, so called because it enacted the imposition of a religious oath upon all persons about to enter the public service, the design being to exclude the Catholics from office. Above all things the House of Commons declared that it would grant no more supplies for the Dutch war. The king resolved to prorogue the assembly; but before he could do so, they voted the alliance with France, and several of his ministers, to be *grievances*. Charles, who, in wishing to be absolute, had been inspired by no other motive than a desire of ease, now saw that there was a better chance of his favourite indulgence in giving way to his subjects than in any other course; and he at once abandoned all his former measures, and concluded a separate peace with Holland. This country was now beginning, under the conduct of the Prince of Orange, to make a good defence against the French, which it was the better enabled to do by obtaining the friendship of Germany and Spain. In the year 1678, after a war, which, without any decisive victories, will ever reflect lustre upon Holland, a peace was concluded. The Prince of Orange, in the previous year, had married the Princess Mary, eldest daughter of the Duke of York, and educated in the reformed faith—an alliance which pleased the English, from its strengthening the Protestant interest, and which was destined, some years after, to bring about important results.

During the whole of this reign the corruptness of the court was very great; but it was, in some measure, the protection of the public. Charles spent vast sums in debauchery, and thus made himself more dependent on his Commons than he would otherwise have been. Many of the Commons were exceedingly corrupt, and all kinds of evil methods were adopted to render them more so. Bribes were distributed among them, and they were frequently *closeted;* that is, brought into the presence of the king individually, and personally solicited for votes. Still a large party maintained its purity and independence, and long kept a majority against the court.

THE POPISH PLOT.

For a century past, one of the grand moving-springs of the public conduct had been a strong detestation and dread of the adherents of the Romish church. This sentiment did not arise from any fear of the numbers or political strength of the Catholics, for they were but a small minority of the nation, but from a belief, generally entertained, that the Catholics scrupled at no treachery or cruelty which might seem favourable to the re-establishment of their religion. The popular notions, newly inflamed by the avowed Catholicism of the Duke of York, heir-presumptive to the crown, and by the late intrigues of the king with France, were encouraged by party who wished to impose restrictions upon the royal prerogative, and to exclude the duke from the succession. In 1678, an account of a plot, supposed to have been formed by the Papists for burning London, massacring the Protestants, and destroying the king and the Protestant religion, was circulated by one Kirby, a chemist, Tong, a weak, credulous person; and Titus Oates, one of the most abandoned miscreants that ever appeared in history. The circumstances attending this pretended discovery were so unlike reality, that, if the nation had not been in a state of hallucination at the time, they never could have been for a moment listened to.

Nevertheless, the Popish Plot, as it was called, was not only generally believed by the people, but also by the Parliament and the court; and such was the extent of the excitement, that a general massacre of the Catholics was apprehended. Even the king, though incredulous, was obliged to give way to the prevailing delusion. Meanwhile, letters were seized, which discovered that the Duke of York carried on a correspondence with France, in opposition to the religion and interests of his country. A correspondence of the king's minister, Danby, which involved the king in the disgrace of similar machinations, was detected; and, to crown the whole, Sir Edmondsbury Godfrey, the magistrate who first gave publicity to the plot, was found in the fields dead, with his own sword stuck through his body. For two years this horrible delusion reigned over the public mind, and under its influence many innocent Catholics were condemned to death. At length the execution of a venerable nobleman, the Viscount Stafford, excited a general sensation of pity, and the people gradually saw and repented of the excesses which they had committed.

THE HABEAS CORPUS ACT—THE EXCLUSION BILL.

At this period, the House of Commons appears for the first time formally separated into the two parties who have ever since been recognised in it. The appellation Tory, applied to the friends of the Court, was originally brought from Ireland, where the word *Torre* (give me), used by a Cavalier banditti, had gradually been extended to the whole of the Cavalier or Royalist party. The term *Whig*, which fell to the lot of the Opposition, is said to have originated in Scotland, being first applied to the sterner portion of the Presbyterian party in the western counties.

The Parliament having impeached Danby, the king dissolved it, and called another. The new assembly, which met in October, 1679, proved equally uncontrollable as the last. It passed, by a majority of seventy-nine, a bill excluding the Duke of York from the succession; declared the king's guards and standing army illegal; and passed the *Habeas Corpus* act, which, limiting the time between the apprehension of a supposed criminal and his trial, rendered it impossible for this or any future sovereign to keep individuals in prison at his pleasure, as had formerly been done. The last measure is still justly looked upon as the great bulwark of personal liberty in Britain. Though the bill for excluding the Duke of York was thrown out by the Upper House, that prince found it necessary to evade the popular odium, first by retiring to Brussels, and afterwards to Scotland. At the same time, the Duke of Monmouth, eldest natural son of the king, and believed by many to be legitimate, began to be regarded by the Presbyterians and liberal party in general as a preferable heir to the crown. In these agitations, the populace of London was particularly active; and it was at this period that the term *mob* was first used. The word was an abbreviation of *mobile vulgus*, a phrase signifying "the unsteady vulgar," which the court contemptuously applied to the crowds which daily assembled.

PERSECUTION IN SCOTLAND.

The persecution in Scotland for field-meetings was so severe, that, before the year 1678, it was supposed that 17,000 persons had suffered by it, in fine, imprisonment, and death. A bond was attempted to be imposed upon the people, in which conventicles were renounced; and, to enforce it in the west country, an army of 10,000 Highlanders was permitted to range there at free quarters. Nothing, it was found, could break the resolution of the people to adhere to their favourite modes of worship; on the contrary, all these severe measures inspired a deep resentment against the government, as well as the prelates. On the 2d of May, 1679, as Archbishop Sharpe was going in his coach to St Andrews, he was beset by a body of desperate men, among whom were Balfour of Burleigh, and Hackstoun of Rathillet, who cruelly slew him. An insurrection of the west country conventiclers immediately followed, and a party of dragoons sent against them, under Captain Graham, of Claverhouse, was gallantly repulsed at Loudon Hill. In a brief space, about five thousand men were found in arms against the state, among whom were many of the lesser gentry, the command being assumed by a gentleman named Hamilton. The rebellion was considered so formidable, that the Duke of Monmouth was sent down to head the troops for its suppression. He found them posted advantageously at Bothwell Bridge (June 22); but divisions on certain religious and political points unfitted them for making a good resistance. After defending the bridge for a while, they turned in a panic, and fled. Three hundred were killed in the pursuit, and twelve hundred taken prisoners.

This unfortunate insurrection, being followed up by fresh severities, effectually subdued all disposition to resistance, except in a small party of the nonconformists, whose principles were of an unusually enthusiastic kind. Twenty armed men, professing these principles, were assailed by a detachment of dragoons, in Airsmoss (1680), when their leader, Cameron, a clergyman, and several others, were killed, after a desperate resistance. Cargill, another preacher of this extreme sect, soon after held a conventicle at Torwood, near Stirling, where he formally excommunicated the king, his brother, and ministers. These proceedings had a highly injurious effect, in as far as they gave occasion for fresh severities against the whole party; but they originated in such pure and pious motives, and brought down such calamities upon the unshrinking heads of those concerned in them, that they have ever since been regarded in Scotland with great respect.

The more uncompromising party soon after arranged themselves into what they called a Secret Society, and (12th January, 1682) openly appeared at Lanark, where they published a declaration of their principles, among which a renunciation of all allegiance to Charles II. was the most remarkable. The dispute between the government and its subjects had now arrived at such an extremity, that individuals were shot in the fields by military law, if they merely refused to acknowledge the royal authority. The most of the people, unable or unwilling to resist, were therefore obliged to give an external reverence to the church established among them, or at least to the irregular clergy, who, by submissions odious to the community, had received what was called an *indulgence* or permission to preach. A great disposition prevailed to emigrate to the American colonies, as the only means of escaping the oppressive restraints which prevailed at home.

THE KING BECOMES ABSOLUTE.

In the mean time, an extraordinary revolution took place in England. About the time that popular feeling was recovering from the mania respecting the Popish Plot, the House of Commons had shown stronger symptoms than ever of a determination to seek the exclusion of the Duke of York from the throne. The time was unfortunate, for men were beginning to suspect that they had been deceived in many of their surmises about danger from the Catholics. The object, moreover, touched upon a principle which many men in that age deemed sacred—that of hereditary succession; nor was it possible to blame the king for opposing a measure so unfavourable to the interests of his nearest blood relation. In fact, the Whig party pushed their favourite measure to such a point as to cause a reaction of the public mind against their views.

The king called a new Parliament to meet at Oxford, resolved, in the event of he not proving more tractable, to take advantage of the popular feeling, dissolve the assembly, and never call another. It met on the 21st of March, 1681, and the Whigs soon showed that the Exclusion Bill was still uppermost in their minds. The king permitted one of his ministers to propose, that, at his death, the Princess of Orange should reign as regent, and the new king be for ever banished five hundred miles from his dominions. To this concession, which now seems much greater than could have reasonably been expected, they would not listen for a moment. Charles then dissolved the Parliament as utterly intractable, and, as he expected, he was generally applauded for the act. Popular feeling had now taken a turn in favour of royalty; and the representative branch of the legislature, long regarded with veneration by the English, was once more permitted to go down without a struggle. The king henceforth ruled entirely without control, being secretly supplied with money by France, in consideration of his non-interference with the conquests of that country.

THE RYE-HOUSE PLOT.—DEATH OF CHARLES II.

A fit of slavishness now befell the English nation, as remarkable in its extent as the late fury against the court and the Catholics. Supported by this mood of the people, Charles caused all the corporations in the kingdom to give up their old charters, and accept of new ones, by which he became all-powerful over the elections of magistrates, and, consequently, over those of parliamentary representatives, should ever another election of that kind take place. The leaders of the late majority in Parliament, comprising the Duke of Monmouth, Lord Russell (son of the Earl of Bedford), the Earl of Essex, Lord Howard, the famous Algernon Sydney, and John Hampden, grandson of the patriot who first resisted Charles I., being reduced to absolute despair, formed a project for raising an insurrection in London, to be supported by one in the west of England, and another under the Earl of Argyle in Scotland, and the object of which should be confined to a melioration of the government. They were betrayed by an associate named Rumsay, and implicated, by a train of unfortunate circumstances, in a plot for assassinating the king (styled the Rye-house plot), of which they were perfectly innocent. By the execution of Russell and Sydney, and some other severities, the triumph of the king might be considered as completed. After having been an absolute sovereign for nearly four years, he died (February 6, 1685), professing himself at the last to be a Catholic, and was succeeded by the Duke of York.

Charles II. was a prince of a gay and cheerful disposition, and so noted a sayer of witty things, and so addicted to humorous amusements, that he was called "the merry monarch." His wit, shrewdness, and good humour, form the best side of his character. On the other side, we find a deficiency of almost every active virtue and of all steady principle. He never allowed any duty of his station, or any claim upon his justice

or clemency, to interfere with his own interests, or even to disturb him in his indolent and vicious pleasures. Neglecting his wife, who never had any children, he spent most of his time with his various mistresses, who openly lived at court, and were even received by the queen. Of these ladies, the most remarkable were Louisa Querouaile, whom he created Duchess of Portsmouth, and Barbara Villiers, whom he made Duchess of Cleveland. Six sons of the king by his mistresses were made dukes, and five of these were the progenitors of families in the English nobility.

During the reign of Charles ..., the nation advanced considerably in the arts of navigation and commerce; and the manufactures of brass, glass, silk, hats, and paper, were established. The post-office, set up during the Commonwealth as a means of raising money, was advanced in this reign, and the penny post was now begun in London by a private person. Roads were greatly improved, and stage-coach travelling was commenced, though not carried to any great extent. During this reign, tea, coffee, and chocolate, which have had a great effect in improving and softening manners, were first introduced. In 1660, the Royal Society was established in London, for the cultivation of natural science, mathematics, and all useful knowledge. The science of astronomy was greatly advanced by the investigations of Flamstead and Halley. But the greatest contribution to science was made by Sir Isaac Newton, whose Principles of Natural Philosophy were published in 1683; in this work, the true theory of planetary motions was first explained, in reference to the principle of gravitation. Amongst the literary men of the period, the first place is to be assigned to John Milton, author of the Paradise Lost and other poems: Samuel Butler shines as a humorous and satirical poet, and Edmund Waller as a lyrist. Amongst divines, the highest names connected with the church are those of Jeremy Taylor and Isaac Barrow; while the highest among the nonconformists are those of Richard Baxter and John Bunyan. The theatre, which had been suppressed during the Commonwealth, was revived in this reign; but the drama exhibited less talent and more licentiousness than it did in the previous reigns. Female characters, which had formerly been acted by men, were now for the first time performed by females.

JAMES II.—EXPEDITION OF MONMOUTH.

Charles II., with all his faults, had conducted himself towards his subjects with so much personal cordiality, and had so well calculated his ground before making any aggressions upon popular liberty, that he might probably have pursued his arbitrary career for many years longer. But his brother James, though much more respectable as a man, more industrious, and more sincere, wanted entirely the easiness of carriage, pleasantry, and penetration, which were the grounds of the late king's popularity and success. He was, moreover, an avowed Catholic, and inspired by an ardent desire of reforming the nation back into that faith. He began his reign by declaring before the privy council his intention to govern solely by the laws, and to maintain the existing church; and such was the confidence in his sincerity, that he soon became very popular. Addresses poured in upon him from all quarters, professing the most abject devotion to his person. The parliament called by him voted an ample revenue, and expressed the greatest servility towards him in all things. The doctrines of passive obedience, and the divine right of the sovereign, were now openly preached. The University of Oxford promulgated an elaborate declaration of passive obedience to rulers, which they declare to be "clear, absolute, and without any exception of any state or order of men."

The remains of the Whig party still existed, though in exile, and there were some districts of the country where they were supposed to have considerable influence. The Duke of Monmouth and the Earl of Argyle (the latter of whom had been condemned to death in Scotland, for adding a qualification to the test-oath, but had escaped) met in Holland, and projected two separate invasions, for the purpose of expelling King James. The former soon after landed in the west of England, with a small retinue, and quickly found himself at the head of 5000 persons, though irregularly armed. At several places he caused himself to be proclaimed king, which offended many of his principal adherents, as inconsistent with his previous engagements. Upon the whole, his conduct was not energetic enough for the management of such an enterprise. Being attacked by the king's troops near Bridgewater, his infantry fought with some spirit, but, being deserted by the cavalry, and by the duke himself, were obliged to give way. Monmouth was taken and executed. Many of his followers were hanged without form of trial by the royal troops, and others were afterwards put to death, with hardly any more formality, by the celebrated Chief-Justice Jefferies, whom the king sent down with a commission to try the offenders. The butchery of several hundred men of low condition, who were unable of themselves to do any harm to the government, was looked upon as a most unjustifiable piece of cruelty, even if it had been legally done; and the principal blame was popularly ascribed to the king.

The Earl of Argyle sailed in May with a corresponding expedition, and landed in that part of the West Highlands which owned his authority. Unfortunately for him, the government had received warning, and seized all the gentlemen of his clan, upon whom he had chiefly depended. He nevertheless raised between two and three thousand men, and made a timid advance to Glasgow, in the expectation of being joined by the persecuted Presbyterians of that part of the country. Being surrounded on the march by various parties of troops, he dispersed his army, and sought to escape in disguise, but was taken, brought to Edinburgh, and executed. Thus terminated the last effort made by the Whig party to ameliorate the despotic sway of the Stuarts.

ARBITRARY MEASURES OF THE KING.

Encouraged by his successes, James conceived that he might safely begin the process of changing the established religion of the country. On the plea of his supremacy over the church, he took the liberty of dispensing with the test-oath in favour of some Catholic officers, and thus broke an act which was looked upon, under existing circumstances, as the chief safeguard of the Protestant faith. His Parliament, servile as it was in temporal matters, took the alarm at this spiritual danger, and gave the king so effectual a resistance that he resorted to a dissolution. Transactions exactly similar took place in Scotland.

Heedless of these symptoms, he proclaimed an universal toleration, for the purpose of relieving the Catholics, and thus assumed the unconstitutional right of dispensing with acts of Parliament. The nation was thrown by this measure, and by the numerous promotions of Roman Catholics, into a state of great alarm; even the clergy, who had been so eager to preach an implicit obedience to the royal will, began to see that it might be productive of much danger. When James commanded that his proclamation of toleration should be read in every pulpit in the country, only two hundred of the clergy obeyed. Six of the bishops joined in a respectful petition against the order; but the king declared that document to be a seditious libel, and threw the petitioners into the Tower. In June, 1688, they were tried in Westminster Hall, and, to the infinite joy of the nation, acquitted.

Blinded by religious zeal, the king proceeded on his fatal course. In defiance of the law, he held open intercourse with the Pope, for the restoration of Britain to the bosom of the Romish church. He called Catholic lords to the privy council, and even placed some in the cabinet. Chapels, by his instigation, were everywhere built, and monks and priests went openly about his palace. A court of high commission—a cruel instrument of power under Charles I.—was erected, and before this every clerical person who gave any offence to the king was summoned. He also excited great indignation, by violently thrusting a Catholic upon Magdalen College, at Oxford, as its head, and expelling the members for their resistance to his will. Public feeling was wound to the highest pitch of excitement by the queen being delivered (June 10, 1688), of a son, who might be expected to perpetuate the Catholic religion in the country, and whom many suspected to be a supposititious child, brought forward solely for that purpose.

The disaffection produced by these circumstances extended to every class of the king's subjects, except the small body of Roman Catholics, many of whom could not help regarding the royal measures as imprudent. The Tories were enraged at the ruin threatened to the Church of England, which they regarded as the grand support of conservative principles in the empire. The Whigs, who had already made many strenuous efforts to exclude or expel the king, were now more inflamed against him than ever. The clergy, a popular and influential body, were indignant at the injuries inflicted upon their church; and even the dissenters, though comprehended in the general toleration, saw too clearly through its motive, and were too well convinced of the illegality of its manner, and of the danger of its object, as affecting the Protestant faith, to be exempted from the general sentiment. But for the birth of the Prince of Wales, the people at large might have been contented to wait for the relief which was to be expected, after the death of the king, from the succession of the Princess of Orange, who was a Protestant, and united to the chief military defender of that interest in Europe. But this hope was now shut out, and it was necessary to resolve upon some decisive measures for the safety of the national religion.

THE REVOLUTION.

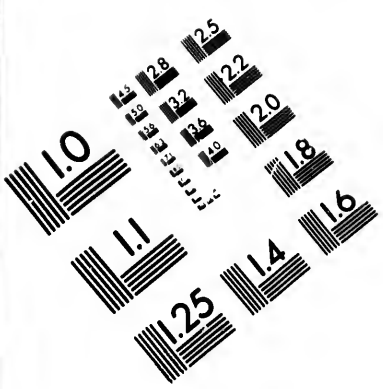
In this crisis, some of the principal nobility and gentry, with a few clergymen, united in a secret address to the Prince of Orange, calling upon him to come over with an armed force, and aid them in protecting their faith and liberties. This prince, who feared that England would soon be joined to France against the few remaining Protestant powers, and also that his prospects of the succession in that country, as nephew and son-in-law of the king,* were endangered, listened readily to this call, and immediately collected a large fleet and army, comprising many individuals, natives of both Scotland and England, who had fled from the severe government of the Stuart princes. The preparations for the expedition were conducted with great secrecy, and James was partly blinded to them, by a rumour that their only object was to frighten him into a closer connection with France, in order to make him odious to his subjects. When he was at length assured by his minister in Holland that he might immediately expect a formidable invasion, he grew pale, and dropped the letter from his hands. He immediately ordered a fleet and large army to be collected, and, that he might regain the affections of his subjects, he called a parliament, and undid many of his late measures. The people justly suspected his concessions to be insincere, and were confirmed in their belief, when, on a rumour of the Prince of Orange being put back by a storm, he recalled the writs for assembling Parliament.

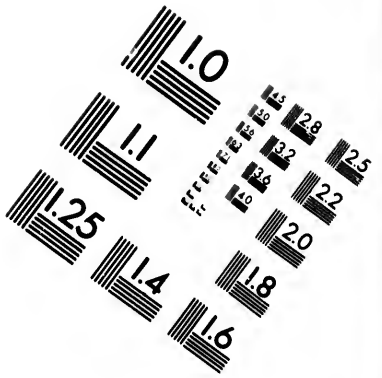
On the 19th of October, the Prince of Orange set sail with 50 ships of war, 25 frigates, 25 fire-ships, and 500 transports, containing 15,000 land troops. A storm occasioned some damage and delay; but he soon put to sea again, and proceeded with a fair wind along the British Channel, exhibiting from his own vessel a flag, on which were inscribed the words, "THE PROTESTANT RELIGION AND THE LIBERTIES OF ENGLAND," with the opposite motto of his family, "*Je Maintiendrai*"—I will maintain. As he passed between Dover and Calais, his armament was visible to crowds of spectators on both shores, whose feelings were much excited at once by its appearance and its well-known purpose. The English fleet being detained at Harwich by the same wind which was so favourable to the prince, he landed (November 5) without opposition at Torbay, and immediately proceeded to circulate a manifesto, declaring the grievances of the kingdom and promising, with the support of the people, to redress them.

At the first it seemed some reason to fear that the prince would not meet with adequate support. On his march to Exeter, and for eight days after arriving there, he was joined by not any person of consequence. The nation, however, soon became alive to the necessity of giving him support. The gentry of Devon and Somersetshires formed an association in his behalf. The Earls of Bedford and Abingdon, with other persons of distinction, repaired to his quarters at Exeter. Lord Delamere took arms in Cheshire; the city of York was seized by the Earl of Danby; the Earl of Bath, governor of Plymouth, declared for the prince; and the Earl of Devonshire made a like declaration in Derby. Every day discovered some new instance of that general confederacy into which the nation had entered against the measures of the king. But the most dangerous symptom, and that which rendered his affairs desperate, was the spirit which he found to prevail in his army. On his advancing at its head to Salisbury, he learned that some of the principal officers had gone over to the Prince of Orange. Lord Churchill (afterwards famous as Duke of Marlborough), Lord Trelawney, and his son-in-law, George, Prince of Denmark, successively followed this example. Even his daughter, the Princess Anne, deserted him. In great perplexity, he summoned a council of peers, by whose advice writs were issued for a new Parliament, and commissioners despatched to treat with the prince. A kind of infatuation now took possession of the king; and, having sent the queen and infant prince privately to France, he quitted the capital at midnight, almost unattended, for the purpose of following them, leaving orders to recall the writs and disband the army. By this procedure, the peace of the country was imminently endangered; but it only served to hasten the complete triumph of the Prince of Orange, who had now advanced to Windsor. The supreme authority seemed on the point of falling into his hands, when, to his great disappointment, the king, having been discovered at Feversham, in Kent, was brought back to London, not without some marks of popular sympathy and affection. There was no alternative but to request the unfortunate monarch to retire to a country house, where he might await the settlement of affairs. James, finding his palaces taken possession of by Dutch guards, and dreading assassination, took the opportunity to renew his attempt to leave the kingdom. He proceeded on board a vessel in the Medway, and, after some obstructions, arrived safely in France, where Louis readily afforded him an asylum.

The same day that the king left Whitehall for the last time, his nephew and son-in-law arrived at St. James's

* The mother of the prince was Mary Stuart, eldest daughter of Charles I., and sister of James II. Failing the infant Prince of Wales, his own wife, and the Princess Anne, the two daughters of the king, he was the heir of the British crown.





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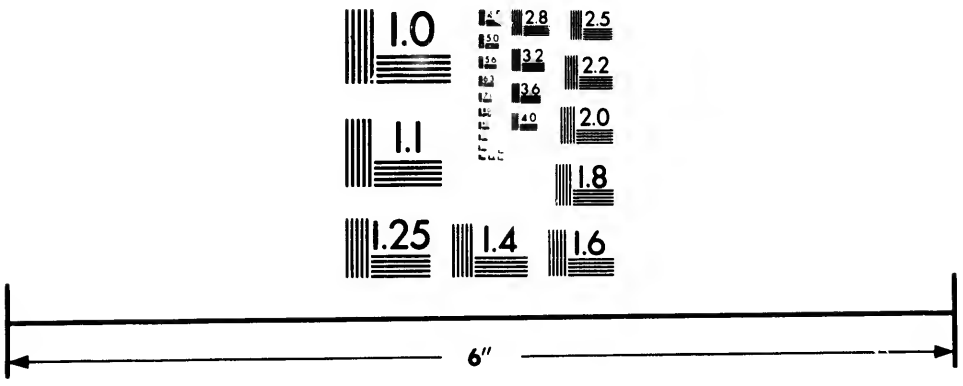

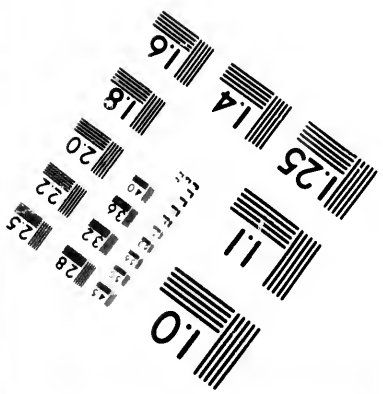

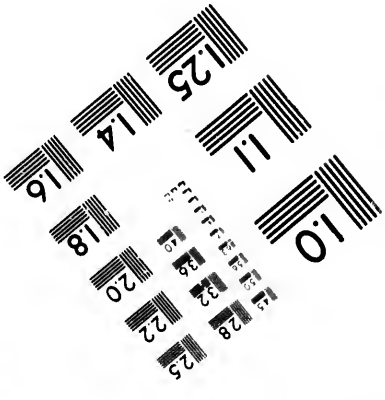

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The public bodies immediately waited on him, to express their zeal for his cause; and such of the members of the late Parliaments, as happened to be in town, having met by his invitation, requested him to issue writs for a convention, in order to settle the nation. He was in the same manner, and for the same purpose, requested to call a convention in Scotland. The English convention met on the 22d of January, 1689, and during its debates the prince maintained a magnanimous silence and neutrality. The Tory party, though it had joined in calling him over, displayed some scruples respecting the alteration of the succession, and seemed at first inclined to settle the crown on the princess, while William should have only the office of regent; but when this was mentioned to the prince, he calmly replied, that in that event, he should immediately return to Holland. A bill was then passed, declaring that "James II., having endeavoured to subvert the constitution, by breaking the *original contract* between the king and people, and having withdrawn himself from the kingdom, has *abdicated* the government; and that the throne is thereby become *vacant*." To the bill was added what was called a *Declaration of Rights*, namely, an enumeration of the various laws by which the royal prerogative and the popular liberties had formerly been settled, but which had been violated and evaded by the Stuart sovereigns. WILLIAM and MARY, having expressed their willingness to ratify this declaration, were proclaimed king and queen jointly—the administration to rest in William; and the convention was then converted into a Parliament.

In Scotland, where the Presbyterians had resumed an ascendency, the convention came to a less timid decision. It declared that James, by the abuse of his power, had *forfeited* all right to the crown—a decision also affecting his posterity; and William and Mary were immediately after proclaimed. By a bill passed in the English Parliament, the succession was settled upon the survivor of the existing royal pair; next upon the Princess Anne and her children; and, finally, upon the children of William by any other consort—an arrangement in which no hereditary principle was overlooked, except that which would have given a preference to James and his infant son.

By the Revolution, as this great event was styled, it might be considered as finally decided that the monarchy was not a divine institution, superior to human challenge, as the late kings had represented it, but one dependent on the people, and established and maintained for their benefit. Many advantages, of smaller importance, though of more direct and practical utility, resulted from the change. The Episcopal Church, which in Scotland had occasioned incessant discontent and disturbance for the last twenty-eight years, was abolished in that kingdom, and the favourite Presbyterian forms were established, to the almost universal satisfaction of the nation. By an act passed in the English parliament, the dissenters from the Church in England were freed from the severities to which they had been exposed during the last two reigns. The royal revenue, which had formerly been fixed at the beginning of each reign, was now settled annually by the House of Commons, so that the king was more under the control of his people than formerly. The independence and impartiality of the judges were now secured by their being appointed for life, or during good behaviour, instead of being removable at the royal pleasure as heretofore. William is said to have wished to grant some further concessions in favour of the Dissenters, but was prevented by the powerful opposition which the Tory party presented in Parliament.

RESISTANCE IN SCOTLAND AND IRELAND.

The new government was at first extremely popular in Scotland; but one portion of the people was much opposed to it. This consisted of the Highland clans—a primitive race, unable to appreciate the rights which had been gained, prepossessed in favour of direct hereditary succession, and of such warlike habits, that though a minority, they were able to give no small trouble to the peaceful Lowlanders. When the Scottish convention was about to settle the crown on William and Mary, Viscount Dundee, formerly Graham of Claverhouse, and celebrated for his severity upon the recusant Presbyterians, raised an insurrection in the Highlands in favour of King James, while the Duke of Gordon, a Catholic, still held out Edinburgh Castle in the same interest. It was with no small difficulty that the new government could obtain the means of reducing these opponents. The castle, after a protracted siege, was given up in June (1689). General Mackay was despatched by William, with a few troops, to join with such forces as he could obtain in Scotland, and endeavour to suppress the insurrection in the Highlands. He encountered Dundee at Killiecrankie (July 27), and, though his troops were greatly superior in number and discipline, experienced a complete defeat. Dundee, however, fell by a musket-shot in the moment of victory, and his army was unable to follow up its advantage. In a short time the Highland clans were induced to yield a nominal obedience to William and Mary.

In Ireland, a much more formidable resistance was offered to the revolution settlement. Since the accession of James, the Romish faith might be described as virtually predominant in that kingdom. The laws against Catholics had been suspended by the royal authority, all public offices were filled by them, and, though the established clergy were not deprived of their benefices, very little tithe was paid to them. The vice-regal office was held by the Earl of Tyrconnel, a violent and ambitious young man, disposed to second the king in all his imprudent measures, and resolved, in the event of their failing, to throw the country into the hands of the French. The people at large, being chiefly Catholics, were warmly attached to the late sovereign, whose cause they regarded as their own.

Early in the spring of 1689, James proceeded from France to Ireland, where he was soon at the head of a large though ill-disciplined army. He immediately ratified an act of the Irish Parliament for annulling that settlement of the Protestants upon the lands of Catholics, which had taken place in the time of Cromwell, and another for attainting two thousand persons of the Protestant faith. The Protestants, finding themselves thus dispossessed of what they considered their property, and exposed to the vengeance of a majority over whom they had long ruled, fled to Londonderry, Inniskillen, and other fortified towns, where they made a desperate resistance, in the hope of being speedily succoured by King William. That sovereign now led over a large army to Ireland, and (July 1) attacked the native forces under his father-in-law at the fords of the Boyne, near the village of Dunore, where he gained a complete victory.

James was needlessly dispirited by this disaster, and lost no time in sailing again to France. In reality, the Irish made a better appearance, and fought more vigorously, after the battle of the Boyne, than before it. The Duke of Berwick, a natural son of James, and the Earl of Tyrconnel, still kept the field with a large body of cavalry, and the infantry were in the mean time effectually protected in the town of Limerick. William invested this town, and, in one assault upon it, lost two thousand men, which so disheartened him, that he went back to England, leaving his officers to prosecute the war. The Irish army afterwards fought a regular battle at Aghrim, when, partly owing to the loss of their brave leader, St. Ruth, they were totally routed. The remains of the Catholic forces took refuge in Limerick, where they finally submitted in terms of a treaty which seemed

to secure the Catholic population in all desirable rights and privileges. It was agreed that they should receive a general pardon; that their estates should be restored, their attainders annulled, and their outlawries reversed; that Roman Catholics should enjoy the same toleration as in the days of Charles II., and not be disturbed in the exercise of their religion; that they should be restored to all the privileges of subjects, on simply swearing allegiance to the king and queen; and that such as chose to follow the fortunes of James (of whom there was a vast number), should be conveyed to the Continent at the expense of government.

King William, whose disposition was tolerant, promised to procure a ratification of this treaty by Parliament, but he was thwarted in his design. An act was passed in England, making it necessary for all members of the Irish Parliament, and all persons filling civil, military, and ecclesiastical offices in Ireland, to take an oath abjuring the most important doctrines of the Catholic faith. After this had taken effect, in the filling of the Irish Parliament with Protestants, an act was passed by that assembly, professing to be a confirmation of the treaty of Limerick, but in reality putting the Catholics into a worse condition than before.

REIGN OF WILLIAM III.

Though all military opposition was thus overcome, William soon found difficulties of another kind in the management of the state. The Tories, though glad to save the established church by calling in his interference, had submitted with no good grace to the necessity of making him king; and no sooner was the danger past, than their usual principles of hereditary right were in a great measure revived. From the name of the exiled monarch, they now began to be known by the appellation of *Jacobites*. James's hopes of a restoration were thus for a long time kept alive, and the peace of William's mind was so much embittered, as to make his sovereignty appear a dear purchase. Perhaps the only circumstance which reconciled the king to his situation, was the great additional force he could now bring against the ambitious designs of Louis XIV. Almost from his accession he entered heartily into the combination of European powers for checking this warlike prince, and conducted military operations against him every summer in person. The necessity of having supplies for that purpose rendered him unfit, even if he had been willing, to resist any liberal measures proposed to him in Parliament, and hence his passing of the famous Triennial Act in 1694, by which it was appointed that a new Parliament should be called every third year. In this year died Queen Mary, without offspring; after which William reigned as sole monarch.

While William was treated in England with less than justice, he lost all his popularity in Scotland, in consequence of two separate acts, characterized by great cruelty and injustice. An order had been issued, commanding all the Highland chiefs, under pain of fire and sword, to give in their submission before the last day of the year 1691. One individual—Macdonald of Glencoe—was prevented by accident from observing the day, and letters of fire and sword, signed by the king, were accordingly issued against him. The military party intrusted with this duty, instead of boldly advancing to the task, came among the clan as friends, partook of their hospitality and amusements, and never indicated their intentions till the morning of the 13th of February (1692), when they attacked the unsuspecting people in their beds, and mercilessly slew all that came in their way. Thirty-eight persons, including the chief and his wife, were slaughtered, and many others died in the snow, as they vainly tried to escape. A more atrocious action does not stain modern history, though the barbarous circumstances of the slaughter were more owing to feelings of private revenge on the part of some of the officials of government in Scotland, than to the intentions of William.

Two or three years after, the Scottish people began to turn their attention to commerce, by which they saw great advantages gained by neighbouring states, and they planned a colony on the Isthmus of Darien, which they thought might become an emporium for American and Indian produce. They subscribed among themselves, for this purpose, no less than £400,000; to which was added more than as much again by merchants in London and Holland. The jealousy of other trading companies, and the remonstrances of the Spaniards, who apprehended some interference with their colonies, induced the king to withdraw his countenance from the scheme, after he had sanctioned it by act of Parliament; but, nevertheless (1698), a gallant expedition was sent out by the Scots, who founded a town called New Edinburgh, about midway between Portobello and Carthagena, and under the ninth degree of latitude. During the winter months, every thing seemed likely to answer the expectations of the colonists; but summer brought disease, and, on their provisions running low, they found, to their infinite consternation, that they could get no supplies, the Spanish and British colonists of the neighbouring countries being forbidden to deal with them. In May and September, 1699, ere intelligence of these circumstances could reach home, two other expeditions had sailed, containing 1800 men, who were involved on their arrival in the same disasters. After disease had swept off many hundreds, the remainder were attacked by the Spaniards, who pretended a right to the country; and to these haughty enemies, who were countenanced in their proceedings by the British sovereign, the unfortunate colony was obliged to surrender. Very few ever regained their native country, and the large sums vested in the undertaking were irrecoverably lost. The massacre of Glencoe, and the Darien expedition, excited the most bitter feelings against the king in the breasts of the Scottish nation, among whom the Jacobite party thenceforward began to assume a formidable appearance.

The peace of Ryswick, concluded in 1697, by which the French power was confined to due limits, permitted William to spend the concluding years of his reign in peace. In 1700, in consideration that he and his sister-in-law Anne had no children, the famous Act of Succession was passed, by which the crown, failing these two individuals, was settled upon the next Protestant heir, Sophia, Duchess of Hanover, daughter of Elizabeth, the eldest daughter of James I.

About this time, the causes of a new war took their rise in certain disputes respecting the succession to the crown of Spain. The title to that sovereignty, in the event of the death of the existing king without heirs, was claimed by the King of France, the Elector of Bavaria, and the Emperor of Germany, through various female lines of descent. A treaty, to which England was a party, was entered into for preventing the whole from falling into the hands of the reigning family of France, whose possessions would then have been so great as to be inconsistent, it was thought, with the independence and safety of the neighbouring states. At the death of the King of Spain, a will was produced, in which it appeared that he had appointed the Duke of Anjou, second son of the Dauphin, to be his successor. The French king lost no time in enforcing the pretensions of his grandson, who, under the title of Philip V., became the founder of the Bourbon dynasty in Spain.

About the same time (September, 1701), James, the exiled English king, died at St. Germains, leaving his pretensions to his son, James, Prince of Wales, now a boy of thirteen years of age, and henceforth generally recognised in Britain by the epithet of the *Pretender*

Without regard to the treaty of Ryswick, Louis XIV. acknowledged this young person as JAMES III., King of Great Britain, by which he added greatly to the hostile feeling which his other proceedings had already created in the British king and people. A war was accordingly in preparation, when King William died (March 2, 1702), in consequence of a fall from his horse.

William was a prince of commanding ability, particularly in military affairs. His ruling sentiment was a wish to reduce the power of the King of France, which he was able in no small degree to effect. His person was thin and feeble, and his ordinary demeanour cold, silent, and somewhat repulsive. It was only in battle that he ever became animated or easy. He was a conscientious man, of sober domestic habits, and sincerely attached to toleration in religion. But for the questionable act of expelling his uncle and father-in-law from the throne, and his concern in the affairs of Glencoe and Darien, no serious blot of any kind would have rested upon his name, either as a public or private person.

The reign of King William is remarkable for the first legal support of a standing army, and for the commencement of the national debt. It is also distinguished by the first establishment of regular banks for the deposit of money, and the issue of a paper currency. Formerly, the business of banking, as far as necessary, was transacted by goldsmiths, or through the medium of the public Exchequer, by which plans the public was not sufficiently insured against loss. In 1695, the first public establishment for the purpose, *the Bank of England*, was established by one William Paterson, a scheming Scotsman; and next year the Bank of Scotland was set on foot by one Holland, an English merchant; the capital in the one case being only £1,200,000, and in the other the tenth part of that sum.

In the reign of King William flourished Sir William Temple, an eminent political and philosophical writer, to whom is usually assigned the honour of first composing the English language in the fluent and measured manner which afterwards became general. The most profound philosophical writer of the age was John Locke, author of an Essay on the Human Understanding, an Essay on Toleration, and other works. Bishop Tillotson stands high as a writer of elegant sermons. The greatest name in polite literature is that of John Dryden, remarkable for his energetic style of poetry, and his translations of Virgil and Juvenal.

QUEEN ANNE.—MARLBOROUGH'S CAMPAIGNS.

William was succeeded by his sister-in-law ANNE, second daughter of the late James II.; a princess now thirty-eight years of age, and chiefly remarkable for her zealous attachment to the Church of England. The movement against the King of France had not been confined to Great Britain; it was a combination of that power with the Emperor of Germany and the States of Holland. Queen Anne found it necessary to maintain her place in the Grand Alliance, as it was termed; and the Duke of Marlborough was sent over to the Continent with a large army to prosecute the war in conjunction with the allies. Now commenced that career of military glory which has rendered the reign of Anne and the name of Marlborough so famous. In Germany and Flanders, under this commander, the British army gained some signal successes, particularly those of Blenheim and Ramillies: in Spain, a smaller army, under the chivalrously brave Earl of Peterborough, performed other services of an important kind. The war, however, was one in which Britain had no real interest—for it has been seen that Spain has continued under a branch of the House of Bourbon, without greatly endangering other states.

A party, consisting chiefly of Tories, endeavoured, in 1706, to put an end to the war: and France was so much reduced in strength as to concede all the objects for which the contest had been commenced. But the people were so strongly inspired with a desire of humiliating France, which in commerce and religion they considered their natural enemy, that some ambitious statesmen of a contrary line of politics were enabled to mar the design of a treaty. Among these was the Duke of Marlborough, who, being permitted to profit, not only by his pay but by perquisites attached to his command, wished the war to be protracted, merely that he might make his enormous wealth a little greater. It was in consequence of these unnecessary interferences with continental politics, urged chiefly by the people, and by a popular class of statesmen, that the first large sums of the national debt were contracted.

UNION OF ENGLAND AND SCOTLAND.

Since their religious enthusiasm had been laid at rest by the Revolution Settlement, the Scottish people had been chiefly animated by a desire of participating in the commerce of England. The treatment of their expedition to Darien had now inspired them with a bitter feeling against their southern neighbours, and they resolved to show their power of counter-annoyance, by holding up threats of dissenting from England in the matter of the succession. In 1703, their Parliament passed the famous *Act of Security*, by which it was ordained that the successor of her Majesty in Scotland should not be the same with the individual adopted by the English Parliament, unless there should be a free communication of trade between the countries, and the affairs of Scotland thoroughly secured from English influence. Another act was at the same time passed, for putting the nation under arms. The English ministers then saw that an incorporating union would be necessary to prevent the Pretender from gaining the Scottish crown, and to protect England from the attacks of a hostile nation. For this purpose they exerted themselves so effectually in the Scottish Parliament, as to obtain an act, enabling the queen to nominate commissioners for the arrangement of a union. The men appointed, thirty on each side, were, with hardly an exception, the friends of the Court and of the Revolution Settlement; and the treaty accordingly was framed without difficulty.

In October, 1706, this document was submitted to the Scottish Parliament, and was found to contain the following principal points:—that the two nations were to be indissolubly united in one government and legislature, each, however, retaining its own civil and criminal law; the crown to [illegible] House of Hanover; the Scottish Presbyterian church to be guarantied; forty-five members to be sent by the Scottish counties and burghs to the House of Commons, and sixteen elective peers to be sent to the Upper House by the nobles; the taxes to be equalized, but, in consideration of the elevation of the Scotch imposts to the level of the English (for the latter people already owed sixteen millions), an equivalent was to be given to Scotland, amounting to nearly four hundred thousand pounds, which was to aid in renewing the coin, and other objects. These terms were regarded in Scotland as miserably inadequate; and the very idea of the loss of an independent legislature and a place among governments raised their utmost indignation. Nevertheless, by dint of bribery, the union was carried through Parliament; and, from the 1st of May, 1707, the two countries formed one state, under the title of the Kingdom of Great Britain.

HIGH CHURCH ENTHUSIASM.

Since the Revolution, the Whigs might be considered as the predominant party in England. They almost exclusively constituted the ministries, and a large majority in the Parliaments, of King William. The sentiments of the queen were of a different cast from theirs. She

disrespected the Revolution Settlement, by which she reigned; and was more zealously attached than they to the Church of England, in all its doctrines, practices, and privileges. As the remembrance of the errors of King James faded from the public recollection, or were put out of view by more recent grievances, the people began to partake more generally of the Tory spirit. The Parliament which they returned at the beginning of the new reign, contained a much larger admixture of that party than the former one. The Tory feeling of both people and Parliament chiefly took the direction of a strong attachment to the Church of England, which they wished to maintain in uncompromising supremacy, and in all its privileges; while the Whig party, in general, were favourable to the toleration called for by the dissenters. The distinction of High Church and Low Church now became conspicuous, the one phrase implying the ecclesiastical views of the Tories, while the other referred to those of the Whigs. In this Parliament, the House of Commons passed a bill against *occasional conformity*, by which penalties were imposed on all persons in office who should attend dissenting places of worship; but it was thrown out by the Upper House, in which the bishops created by William voted against it.

An imprudent act of the ministry raised the High Church enthusiasm to an extraordinary height. A divine of inferior note, named Henry Sacheverell, had preached a violent sermon, in which he seemed to call upon the people to take up arms in defence of their endangered church. The ministers were so weak as to give this man a solemn trial, during which the people rose so tumultuously in his favour, that, though declared guilty, it was found impossible to inflict upon him more than a nominal punishment. After the trial, he received more marks of public reverence and honour than were ever bestowed on the greatest national benefactor. In proportion to the popularity of Dr. Sacheverell, was the loss of public favour experienced by the Whig party. About the same time, through some court intrigues, they forfeited all remaining favour with their royal mistress. Mrs. Masham, a lady of the court, and favourite of the queen, had contrived to introduce into the cabinet two Tory statesmen, Mr. Robert Harley, afterwards Earl of Oxford, and Mr. Henry St. John, afterwards Lord Bolingbroke. These gentlemen having attempted to set up a party for themselves, their superior, Lord Godolphin, dismissed them, to the great displeasure of Queen Anne, who now resolved to get quit of the Whig party at the first opportunity. In August, 1710, Harley and St. John came into power at the head of a decidedly Tory ministry, which, though of brief duration, was destined to make an important figure in the national history. The queen at the same time called a new Parliament, which proved to be almost wholly composed of the Tory party.

PEACE OF UTRECHT.—DEATH OF QUEEN ANNE.

The members of the new cabinet immediately applied themselves, though very secretly, to the business of bringing about a peace. When their plans were matured, the consent of the House of Commons was easily gained; but the Lords having shown some reluctance, it was found necessary to create twelve new peers, in order to overpower the sense of that part of the legislature. After a tedious course of negotiation, Britain and Holland concluded a peace at Utrecht (1713), leaving the Emperor of Germany still at war. By this arrangement, Philip V. was permitted to retain Spain and the Indies, but no other part of the dominions which his ambitious grandfather had endeavoured to secure for him; and it was provided that he and his descendants should never inherit the kingdom of France, nor any future King of France accede to the crown of Spain. Britain obtained nothing tangible by all her exertions, except the possession of Gibraltar and Minorca, and the privilege of being exclusively employed to carry slaves to the Spanish American colonies. It has justly been considered a stain upon the nation, that it should have concluded a separate peace under such clandestine circumstances, as the interests of the other belligerent parties were thereby greatly injured. For the gratification of their High Church supporters, the ministers obtained an act for preventing dissenters from keeping schools, and another for establishing church patronage in Scotland, the former of which was repealed in the following reign.

It is believed that Queen Anne and her Tory ministers were in secret willing to promote the restoration of the main line of the Stuart family, and Harley and St. John are now known to have intrigued for that purpose. But before any plan could be formed, the queen took suddenly ill and died (August 1, 1714), when the ministers had no alternative but to proceed according to the Act of Settlement. The Electress Sophia being recently dead, her son, the elector, was proclaimed under the title of GEORGE I.

The reign of Queen Anne is not more distinguished by the wonderful series of victories gained by Marlborough, than by the brilliant list of literary men who now flourished, and who have caused this to be styled the Augustan age of English literature, as resembling that of the Roman Emperor Augustus. Alexander Pope stands unrivalled in polished verse on moral subjects. Jonathan Swift is a miscellaneous writer of singular vigour and an extraordinary kind of humour. Joseph Addison wrote on familiar life and on moral and critical subjects with a degree of elegance before unknown. Sir Richard Steele was a lively writer of miscellaneous essays. This last author, with assistance from Addison and others, set on foot the Tatler, Spectator, and Guardian, the earliest examples of small periodical papers in England, and which continue to this day to be regarded as standard works. Cibber, Congreve, Vanburgh, and Farquahar, were distinguished writers of comedy; and Prior, Philips, and Rowe, were pleasing poets. In graver literature, this age is not less eminent. Dr. Berkeley shines as a metaphysician; Drs. Sherlock, Atterbury, and Clark as divines; and Bentley as a critic of the Roman classics.

ACCESSION OF THE HOUSE OF HANOVER.—REBELLION OF 1715–16.

The new sovereign lost no time in coming over to Britain, and fixing himself in that heritage which his family has ever since retained. He was fifty-four years of age, of a good though not brilliant understanding, and very firm in his principles. Knowing well that the Whigs were his only true friends, he at once called them into the administration. It was the custom of that period for every party, on getting into power, to try to annihilate their opponents. Not only were the whole Tory party insulted by the king, but a committee of the House of Commons was appointed to prepare articles of impeachment against Oxford, Bolingbroke, the Duke of Ormond, and the Earl of Stratford. Bolingbroke, perceiving his life to be in danger, fled to the Continent; and his attainder was in consequence moved and carried by his rival Walpole. Ormond suffered a similar fate. Oxford, after a protracted trial, was only saved in consequence of a difference between the Lords and Commons.

During the first year of King George, the Tories kept up very threatening popular disturbances in favour of High Church principles: but the Whigs, gaining a majority in the new House of Commons, were able to check this a little by the celebrated enactment called the *Riot Act*, which permits military force to be used in dispersing a crowd, after a certain space of time has been allowed. Disappointed in their hopes of office and power and stung by the treatment of their leaders, the Tories

resolved to attempt bringing in the Pretender by force of arms. With an eager hopefulness, which for a long time was characteristic of the party, they believed that all England and Scotland were ready to take up arms for the Pretender, when in reality there was but a limited portion of the people so inclined, and that portion unwilling to move, if they saw the least risk. Blind to these circumstances, and without design or concert, they commenced the unfortunate civil war of 1715

The Earl of Mar, who had been a secretary of state in the late administration, raised his standard in Braemar (September 6), without any commission from the Pretender, and was soon joined by Highland clans to the amount of 10,000 men, who rendered him master of all Scotland north of the Forth. There, however, he weakly permitted himself to be cooped up by the Duke of Argyle, who, with a far less numerous force, had posted himself at Stirling. Mar expected to be supported by an invasion of England by the Duke of Ormond, and a rising of the people of that country. But the duke completely failed in his design, and no rising took place, except in Northumberland. There Mr. Foster, one of the members of Parliament for the county, and the Earl of Derwentwater, with some other noblemen, appeared in arms, but unsupported by any considerable portion of the people. Mar detached a party of 1800 foot, under Mackintosh of Borlum, to join the Northumbrian insurgents, who complained that they had no infantry. The junction was managed with great address; and at the same time some noblemen and gentlemen of the south of Scotland attached themselves to the southern army. The government was ill provided with troops; but it nevertheless sent such a force against Mr. Foster, as obliged him to retire with his men into the town of Preston, in Lancashire, where, after an obstinate defence, the whole party (November 13) surrendered themselves prisoners at the king's mercy. On the same day, the Earl of Mar met the Duke of Argyle at Sheriffmuir, near Dunblane, where a battle was fought, in which, after the manner of the battles in the civil war, the right wing of each army was successful, but neither altogether victorious. The duke withdrew in the face of his enemy to Stirling, and the earl retired to Perth, resolved to wait for the news of an invasion from France, and for the arrival of the Pretender, whom he had invited to Scotland.

Mar did not for some time become aware how little reason he had to expect support from France. Louis XIV., upon whom the hopes of the party greatly rested, had died in September, leaving the government to the Regent Orleans, who had strong personal reasons for wishing to cultivate the good will of the British monarch, and of course declined to assist in the present enterprise. The Pretender, nevertheless, sailed for Scotland, and, on the 22d of December, arrived incognito at Peterhead, bringing nothing but his own person to aid his adherents. Mar, who had already attempted to negotiate a submission to the government, brought him forward to Perth, where he was amused for some time with preparations for his coronation. But before he had been many days there, the Duke of Argyle found himself in a condition to advance against the insurgent force; and, on the 30th of January, 1716, this unfortunate prince commenced a retreat to the north, along with his dispirited army. On the 4th of February, he and the Earl of Mar provided for their own safety by going on board a vessel at Montrose, and setting sail for France; the army dispersed itself into the Highlands. For this unhappy appearance in arms, the Earl of Derwentwater, Viscount Kenmure, and about twenty inferior persons, were executed; forty Scottish families of the first rank lost their estates, and many excellent members of society became exiles for the remainder of their lives.

CHARACTER OF THE GOVERNMENT UNDER GEORGE I.

The suppression of this insurrection, and the ruin of so many Tory leaders, tended to increase the power of the Whig party, and the stability of the Hanoverian dynasty. The government, nevertheless, acted under considerable difficulties, as they were opposed by the majority of the clergy and country gentry, as well as by the whole of the mob feeling, except in the large commercial towns. To avoid the hazard of too often appealing to the people, they carried, in 1716, a bill for repealing King William's Triennial Act, and protracting the present and all future Parliaments to a duration of seven years. The chief popular support of the government was in the Dissenters, and the middle classes of the community.

From the peace of Utrecht, Britain remained free from foreign war for nearly thirty years, excepting that, in 1719, the ministry was called on to interfere for the repression of an attempt on the part of Spain to regain her Italian territories. A Scotsman, named Law, who had become comptroller-general of France, and amused that country with financial schemes, which at first promised to enrich, but finally almost ruined the country, was the means, in 1720, of inspiriting the British people with a similar visionary project, called the South Sea Scheme. This might be described as a joint-stock company, professedly trading in the South Seas, but chiefly engaged in a scheme for managing the national debt. It seemed for a time to prosper, and many realized large fortunes by selling their shares at a premium to others; but in a short time its unsoundness was discovered, the price of shares fell, and thousands were utterly ruined. With great difficulty, and by an extremely complicated adjustment, the House of Commons equalized as nearly as possible the state of gain and loss among the innocent parties, and credit was restored. Sir Robert Walpole, who was chiefly concerned in effecting this arrangement, became Premier and Chancellor of the Exchequer, and for upwards of twenty years, from that period (April, 1721), he must be looked on as the prime manager of the public affairs.

At the beginning of the reign of George I., the national debt amounted to fifty-three millions, and, owing to there having been no war, it was rather less at the time of the king's death. The annual expenditure of the state was about seven millions, or scarcely a seventh part of what it now is. The commerce and manufactures of England continued to advance steadily during this reign; but Scotland and Ireland remained in an unimproved state. Roads were now for the first time made in the Highlands. The chief literary men were the same as those who had come into repute in the time of Queen Anne: in addition to them John Gay is to be reckoned among the poets, and Waterland and Lardner among the divines. This was also more particularly the age of Daniel Defoe, a dexterous writer of pamphlets on the nonconformist side, but far more noted in later times on account of his admirable tale of Robinson Crusoe.

GEORGE II.—WAR WITH SPAIN AND FRANCE.

George I., at his death in 1727, was succeeded by his son, GEORGE II., a prince of moderate abilities, but conscientious, and free from all gross faults. In the early part of his reign, Walpole effected some useful measures, and upon the whole was a vigorous and enlightened administrator of public affairs, though nothing can justify the extensive system of bribery by which alone he pretended to manage the House of Commons. After a peace of extraordinary duration, he was urged, much against his will, into a contest with Spain, on account of some efforts made by that country to check an illicit trade carried on by British merchants in its American

colonies. In searching vessels for the prevention of this traffic, the Spaniards had made some trifling aggressions; and British spirit took fire at the indignity of being liable to a search by any neighbouring state, even for the prevention of a notorious breach of treaty. The community therefore demanded a war, and the minister, with great reluctance, was obliged to comply. One fleet, under Admiral Haddock, was sent to cruise off the coast of Spain, and another, under Admiral Vernon, was sent against the American colonies. The latter gained lustre by taking the important town of Portobello. Another and larger expedition, with 10,000 soldiers, was then sent to reinforce Vernon; but, owing to disputes between him and the commander of the troops, no further triumphs were gained. A timid, ill-concerted, and ill-conducted attack upon the fortifications of Carthagena, lost Britain about 20,000 men. Meantime, a third fleet, under Anson, sailed to the eastern coast of Spanish America, in order to co-operate with Vernon; but only one of the vessels reached its destination. Anson, thus reduced in naval force, took several prizes off Chili, and plundered the town of Puita, but could venture upon no more hazardous enterprise. He cruised across the Pacific, in the hope of meeting one of the Spanish galleons, which usually contained great quantities of bullion; but did not succeed, till, on his return from refitting at Canton, he took the Manilla transport, with treasure to the amount of three hundred thousand pounds. Though he had failed in all the proper objects of his expedition, the money he brought to the public treasury caused him to be very well received by the people; while the flagrant mismanagement at Carthagena was the subject of general execration.

The Spanish war now languished for some time, while the attention of Britain was attracted to the proceedings of France. After the death of the Emperor Charles VI. of Germany, his dominions fell by inheritance to his daughter, the celebrated Maria Theresa, Queen of Hungary. She was opposed in this succession by the sovereigns of France, Saxony, and Bavaria, all of whom pretended to have some claims on her dominions. A war was commenced against her; the Elector of Bavaria was crowned emperor, under the title of Charles VII.; and such was the success of the French arms, that she was soon reduced to the greatest distress. With this quarrel Britain had little reason for interfering; but the king thought his dominions in Germany endangered, and the people were animated by their usual hostility to the French. Walpole, being conscientiously opposed to the war, allowed himself to be driven from office (February, 1742), though he still continued to enjoy the respect of the king.

The ministry was recruited by the most popular men of the late minority, among whom the most conspicuous were Lord Carteret and the Earl of Bath. To the surprise of the nation, this set of statesmen opposed, now they were in power, all the improvements they had lately professed to clamour for, and seemed even more willing than their predecessors to carry out the policy which was suggested by the king's anxiety on account of his foreign dominions. About the time when Great Britain entered into this struggle, the affairs of the Hungarian queen took a surprising turn, and her armies, under her husband the Grand Duke of Tuscany, Prince Charles of Lorraine, and other eminent commanders, began to drive her enemies from her dominions. France, having lost 100,000 men in the contest, sued for peace; but this the queen haughtily refused, in the hope of gaining still greater triumphs by means of Britain. The aid of that power, as it turned out, was of little service to the queen. The Earl of Stair had permitted his army to get into a position of great difficulty at Aschaffenburg, on the Upper Maine, and, but for a blunder of the French, it would probably have been starved into a surrender, along with the king and prime minister (Carteret), both of whom had recently joined it. The blunder consisted in an attack made by the Duke of Grammont, with 30,000 troops, upon the British and Hanoverian infantry, upon a plain near the village of Dettingen (June 16, 1743). The infantry, cheered by the presence of the king, who rode between the lines with his sword drawn, received the charge of the French cavalry with great firmness, and compelled them to retreat—a movement which communicated a panic to the whole French army, and might have been attended with the most disastrous consequences, if the British monarch would have permitted his advantage to be followed up. This was the last occasion of a king of Great Britain appearing on the field of battle.

The death of the Emperor, Charles VII., for whom this great European contest appeared to have taken its rise, might have now given an opportunity for the cessation of hostilities; but the French thought the war still necessary, in order to prevent the husband of Maria Theresa from being elected emperor, and the British were still animated by their usual antipathy to the French. A campaign was therefore opened in Flanders, the troops of the French nation being commanded by Count Saxe, distinguished for military genius and experience; while the British and Hanoverian army was under the charge of the young Duke of Cumberland, second son to the king. To animate the French troops, their sovereign (Louis XV.) and the dauphin attended the camp. The French having invested Tournay, it was resolved by the English to hazard a battle, in order to save that strong city.

The rencontre took place (May, 1745) at Fontenoy, near the bridge of Colonne. The British infantry advanced under Cumberland, and, notwithstanding a tremendous fire, which swept them off in whole ranks, attacked the centre of the position of the French army, which they beat back in so furious a style, that Saxe advised the king to retire for the safety of his person Louis bravely refused to stir, being apprehensive that a retrograde motion on his part would decide the day against his army. Ashamed to desert their sovereign, the French returned to the charge; the cavalry renewed their efforts; and other circumstances conspired to give a turn to the battle. The British cavalry were prevented by a mistake from giving their support to the infantry; and the Dutch and Austrian part of the army was found totally ineffective. Assailed on all sides, fatigued with their great exertions, and galled by the French batteries, the infantry was obliged to retire, with a loss of 7000 men, after having beaten every regiment in the French army. The Duke of Cumberland, though able to withdraw in good order, did not venture after this disaster to face the enemy during the whole campaign. Nevertheless, the Queen of Hungary at this time gained the summit of her wishes, by the election of her husband to the imperial throne.

REBELLION OF 1745.

The Pretender had married, in 1719, the Princess Clementina Sobieski of Poland, and was now the father of two sons in the bloom of youth, the elder of whom has been distinguished in history by the title of Prince Charles Stuart. The misfortunes of the British arms on the Continent, and the dissensions which prevailed among the people and the Parliament, encouraged this prince to make an attempt to recover the throne of his ancestors. In 1744, he had been furnished by France with a large fleet and ample stores to invade the British dominions, but had been driven back by a storm, and prevented from again setting sail by a superior fleet under Sir John Norris. The object of France in this enterprise was to produce a diversion in favour of her own army in the Netherlands. At present, in conse-

ence of the victory of Fontenoy, such an enterprise as no longer necessary; but though the French monarch would not grant him any further supply, Charles resolved to make the proposed attempt, trusting solely to the generosity and valour of his friends in Britain. He therefore landed from a single vessel, with only seven attendants, on the coast of Inverness-shire, where the clans most attached to his family chiefly resided. By merely working upon the ardent feelings of the Highland chiefs, he soon induced several of them to take up arms, among whom were Locheil, Clanranald, Glengary, and Keppoch.

On the 19th of August, he raised his standard at Glenfinnan, within a few miles of the government station of Fort William, and found himself surrounded by about 1500 men. The government was at first inclined to disbelieve the intelligence of these proceedings, but was soon obliged to take steps for its own defence. A reward of thirty thousand pounds was offered for the head of the young prince, who, with all his family, was under attainder by act of Parliament; and Sir John Cope, commander of the forces in Scotland, was ordered to advance with what troops he had into the Highlands, and suppress the insurrection. Cope proceeded on this mission with about 1400 infantry; but on finding the Highlanders in possession of a strong post near Fort Augustus, he thought it necessary to go aside to Inverness. Charles, taking advantage of this ill-judged movement, immediately poured his clans down into the Lowlands, gaining accessions everywhere as he advanced; and, there being no adequate force to oppose him, he took possession successively of Perth and Edinburgh.

Cope now transported his troops back to Lothian by sea, and, on the 21st September, a rencontre took place between him and Charles, at Prestonpans. Seized with a panic, the royal troops fled disgracefully from the field, leaving the prince a complete victory. With the lustre thus acquired by his arms, he might have now, with four or five thousand men, made a formidable inroad into England. Before he could collect such a force, six weeks had passed away, and when at length (November 1) he entered England, a large body of troops had been collected to oppose him. After a bold advance to Derby, he was obliged by his friends to turn back. At Stirling he was joined by considerable reinforcements, and on the 17th of January, 1745, a battle took place at Falkirk between him and General Hawley, each numbering about 8000 troops. Here Charles was again successful; but he was unable to make any use of his victory, and soon after found it necessary to withdraw his forces to the neighbourhood of Inverness, where he spent the remainder of the winter. The Duke of Cumberland now put himself at the head of the royal troops, which had been augmented by 6000 auxiliaries under the Prince of Hesse. During the months of February and March, the Highland army was cooped up within its own territory, by the Hessians at Perth, and the royal troops at Aberdeen. At length, April 16, Prince Charles met the English army in an open moor at Culloden, near Inverness, and experienced a total overthrow. He had himself the greatest difficulty in escaping from the country, and the Highlands were subjected for several months to the horrors of military violence in all its worst forms.

To complete the subjugation of this primitive people, the hereditary jurisdictions under which they and the rest of the people of Scotland still lived, and by which the nobles and gentry were enabled to administer justice at their own discretion, were abolished by act of Parliament. Another act put an end to the tenure of ward-holdings, by which the land-proprietors were enabled to command the personal services, in peace and war, of those who lived on their estates. A third act prohibited the use of tartan and the ancient Highland fashion of clothes, which were supposed to have the effect of keeping alive the warlike spirit of the mountaineers. The two former of these measures, in connection with the suppression of the Stuart cause, and some other circumstances, produced a marked improvement in the social state of the Scottish people. The government, it must be remarked, had hitherto acted towards Scotland in a harsh and partial spirit. Suspected and hated by the ruling faction, the Highlanders had every temptation to continue in adherence to the exiled family. But when the government began to treat them in a milder spirit, and admitted them to the army and other branches of the public service, their naturally generous and loyal feelings were turned as zealously in favour of the new dynasty as they ever had been in favour of the old. The middle of the eighteenth century may be described as the time when Scotland, after a long period of sloth and poverty, first began to make advances towards that equality with England, in respect of comfort and prosperity, which it has since attained.

PEACE OF AIX-LA-CHAPELLE.

During the remainder of the war in which Britain and other powers were now engaged with France, the latter was generally successful by land, and unfortunate at sea, the contrary being the case with Britain. In 1748, the two countries found, after nine years of contention, that their losses were equal, though in different departments of their strength. Thirty millions had been added to the national debt of Britain, and France had expended an equal sum. They therefore agreed, by a treaty formed at Aix-la-Chapelle, mutually to restore their respective conquests, and to go back to exactly the same condition in which they stood before the war. A more signal illustration could have scarcely been held forth of the important truth—that war is to the parties in general only a means of waste and loss, and can do no good to any man except at the expense of his neighbour.

COLONIES AND DEPENDENCIES OF BRITAIN.—THE SEVEN YEARS' WAR.

For several years after this period the national resources underwent rapid improvement. The most respectable minister who immediately followed Walpole, was the Honourable Henry Pelham, First Lord of the Treasury and Chancellor of the Exchequer, whose commercial and financial schemes were usually very successful. Since the reign of Elizabeth, the British had been active in planting and rearing colonies; of which a considerable number now existed in the West Indies and in North America. The East India Company had also obtained large possessions in Hindostan, which proved the source of great wealth to Britain. The exclusive spirit in which Britain managed the commerce of those territories, provoked the cupidity of the French, who commenced a system of aggression both in India and North America. They, in particular, drew a line of forts along the back settlements of the whole range of the American colonies, from the Gulf of St. Lawrence to the Mississippi, so as to prevent the settlers from advancing beyond the Appalachian mountains.

For two or three years the British government suffered these aggressions, and even insults of a more decided nature, to pass unresented; but at length it was determined, in 1756, to proclaim war. A campaign of a novel and difficult character was opened in North America, for the purpose of driving the French from their forts. The first movements were attended with defeat and disaster. The French had gained the exclusive affection of the native Indians, who proved a dangerous and barbarous enemy to the British. Several of the forts were attacked, but without success; in the assault upon Ticonderoga, 2000 men were killed. A

South, on the accession of Mr. William Pitt (afterwards Earl of Chatham) to the office of Secretary of State, a more auspicious era commenced. The British troops and provincials became more experienced in the nature of the service. One after another, the principal forts fell into their hands; and a diversion was created by an attack upon Canada. In September, 1759, General Wolfe reduced the town and fort of Quebec, though at the expense of his own life; and the whole colony soon after submitted to the British arms. Meanwhile, Colonel Clive had been equally successful in the East Indies. He had destroyed the French settlement at Pondicherry, thereby securing to his country the whole coast of Coromandel; and by his famous victory at Plassey (June 26, 1756), over a combination of French and native forces, he laid the foundation of the great territorial power which the British have since gained in Hindostan. Thus the French, instead of gaining the colonies of other nations, ended by losing some of their own.

While Britain was thus successful in two remote quarters of the world, she experienced a different fortune in Europe. Austria, Russia, and Poland, had combined with France against the new and rising power of Prussia, which was at present directed by Frederick II., commonly called Frederick the Great. Britain on this occasion became the ally of the Prussian monarch, not from any regard to her own interests, but in order that the king might be able to protect his Hanoverian dominions. Immense sums of money were raised for the purpose of paying the troops of those countries which the king was anxious to defend; and the Duke of Cumberland was appointed their commander. This prince was so unfortunate (September, 1757) as to bring an army of 40,000 men into an angular piece of country, from which there was no escaping, so that the whole were obliged to lay down their arms to the French, who then became masters of Hanover. Notwithstanding this failure on the part of his ally, Frederick was able, by his extraordinary military genius, and by British subsidies, to defend his dominions for several years against all the forces that Austria, France, and Russia, could bring against him. In the midst of this war (October 25, 1760), George II. died suddenly, in the seventy-seventh year of his age, and was succeeded by his grandson GEORGE III., then only in his twenty-third year.

MISCELLANEOUS CIRCUMSTANCES CONNECTED WITH THE REIGN OF GEORGE II.

The chief domestic event of the reign of George II. was the rise of the religious sect called Methodists. The church had for a considerable time been in a languid state; amongst the community there was little religious feeling of a fervid character; and at no previous time were there so many conspicuous writers against the main doctrines of Christianity. John Wesley, a clergyman of the established church, and several other individuals of an enthusiastic turn of mind, were prompted by these circumstances to attempt to rouse a more zealous piety amongst the people; and in this object they were surprisingly successful. Another clergyman, named Whitefield, gifted with oratorical powers which gave him great command over the feelings of an audience, proved of much service as an itinerant preacher in working this reformation. The consequence of these exertions was the organization of a new religious body, generally called Methodists, comprehending a vast number of congregations in all parts of the kingdom, as well as in the American colonies.

Newspapers first acquired political importance in this reign. They originated in the time of the Commonwealth, but none of a regular periodical nature appeared till after the Restoration, when a busy writer named Roger L'Estrange established in London a weekly one called *The Intelligencer*. Till the Revolution, such small and unimportant newspapers as existed, were trammelled by a licensing power and censorship. When these restrictions were removed, newspapers increased in number, till, in 1709, they were again restricted by the imposition of a penny stamp. In those days newspapers were chiefly conducted by a set of mean and poor writers, to whom the term "Grub Street authors" was generally applied, from many of them living in that wretched part of London. The influence which newspapers were calculated to have over the public mind, was first recognised by Sir Robert Walpole, who, while he never thought of giving the least encouragement to literature on its own account, liberally pensioned various editors who supported his government. About the beginning of this reign, there were, in London, one daily paper, fifteen three times a week, and one twice a week, besides a few country papers. A monthly pamphlet, begun in 1731 by Edward Cave, a London bookseller, under the name of the *Gentleman's Magazine*, was composed of the best articles from the newspapers; and thus originated the periodical works termed magazines, which are now conspicuous as vehicles of light literature and political discussion.

The peculiar literary genius of the age was shown in the fictitious prose writings of Fielding, Smollett, and Sterne, and in the pictures of Hogarth, all of which represent the national character in its greatest breadth. The novels of Richardson are equally accurate as descriptions of manners, but contain no trace of the same humour. Next in distinction to these writings, must be placed the essays of John Hawkesworth and Samuel Johnson, the latter of whom did a great service to literature in compiling a dictionary of the English language. James Thomson, William Collins, and Thomas Gray, rank high as poets. Carte and Echard were respectable historical writers; and philosophy was cultivated by Francis Hutcheson and David Hartley. Drs. Conyers Middleton, Joseph Butler, and Isaac Watts, were the principal writers on religious subjects.

GEORGE III.—BUTE ADMINISTRATION—PEACE OF 1763.

Soon after his accession, George III. espoused the Princess Charlotte of Mecklenburg-Strelitz, by whom he had a large family. One of his earliest political measures was to confer one of the state secretaryships upon the Earl of Bute, a Scottish nobleman of Tory or Jacobite predilections, who had been his preceptor, and possessed a great influence over his mind. This, with other alterations, infused a peaceful disposition into his majesty's counsels, which was not much relished by Mr. Pitt. That minister, having secretly discovered that Spain was about to join France against Britain, and being thwarted in the line of policy which he consequently thought it necessary to assume, retired with a pension, and a peerage to his wife; after which the ministry was rendered still less of a warlike temper. A negotiation for peace was entered into with France, which offered, for that end, to give up almost all her colonial possessions. The demands of the British were, however, rather more exorbitant than France expected, and not only was the treaty broken off, but Spain commenced those hostilities which Mr. Pitt had foretold. Nevertheless, Britain continued that splendid career of conquest, which, except at the beginning, had been her fortune during the whole of this war. In a very few months, Spain lost Havana, Manilla, and all the Philippine Isles. The Spanish forces were also driven out of Portugal, which they had unjustly invaded. At sea the British fleets reigned everywhere triumphant, and at no former period was the country in so proud a situation. The ministry, however, were sensible that war, even with all this good fortune, was a losing game; and they therefore, much against the will of the nation, concluded a peace in February, 1763.

By this treaty, Great Britain gave up certain parts

of her conquests, in exchange for others which had been wrested from her; but she was nevertheless a gainer to an immense amount. She acquired from the French, Canada, that part of Louisiana east of the Mississippi, Cape Breton, Senegal, the islands of Grenada, Dominica, St. Vincent's, and Tobago, with all the acquisitions which the French had made upon the Coromandel coast in the East Indies since 1749. From Spain she acquired Minorca, East and West Florida, with certain privileges of value. The continental states in alliance with Great Britain were also left as they had been. These advantages on the part of Great Britain had been purchased at the expense of an addition of sixty millions to the national debt, which now amounted in all to £133,959,270.

We now direct our attention to Ireland, where some important transactions had occurred since the early part of the century.

FROM THE PEACE OF 1763 TILL THE YEAR 1840.

TRANSACTIONS IN IRELAND.

Since the pacification at Limerick, Ireland had been ruled exclusively by the Protestant party, who, under the influence of feelings arising from local and religious antipathies, had visited the Catholics with many severities. These measures naturally rendered the Catholics discontented subjects, and led to much turbulence. The common people of that persuasion, being denied all access to justice, took it into their own hands, and acquired those lawless habits for which they have since been remarkable. Treachery, cruelty, and all the lower passions, were called into vigorous exercise. The passing of a bill in 1719 by the English Parliament, declaring its power to legislate for Ireland, occasioned general dissatisfaction, and caused the rise of a patriotic party in the Parliament and people of Ireland, who professed to look to the advantage of the country, as distinguished from that of Great Britain. The discontent of the Tory party mingled with this spirit; and the celebrated Swift, in 1724, blew it into a flame by his severe pamphlets, called the *Drapier's Letters*, which professedly decried a new coinage of halfpence, but were in reality aimed at the English ministry.

The discontents of the Catholics continued unabated, and the contentions of the patriotic party with the adherents of the English ministry were carried on with the utmost keenness in Parliament, when the rebellion in Scotland (1745) alarmed the government for the loyalty of Ireland. The Earl of Chesterfield, celebrated for his literary productions, was, in this exigency, sent for a short time as lord-lieutenant, and allowed to hold forth all possible encouragement to the Catholics and patriotic party. By discountenancing party distinctions, and giving the Catholics the full protection of the laws, he so effectually soothed and tranquillized the country, that, while the neighbouring Protestant kingdoms exhibited an army seeking the restoration of a Catholic prince, Ireland, though full of Christians of that persuasion, and bound to the Jacobite cause by many endeared associations, remained perfectly faithful to the Hanover dynasty. When the danger was past, the earl was recalled, and the former system resumed. The struggles of the patriots with the English ministerial party were continued with unabated violence down to the death of George II., without producing any marked benefit to Ireland, although at one time the former party gained an ascendency in the native Parliament.

CASE OF MR. WILKES.

Ever since the accession of the Brunswick family in 1714, the government had been chiefly conducted by the Whig party, who formed a very powerful portion of the aristocracy of England. Walpole, Pelham, Newcastle, and Pitt, had all ruled chiefly through the strength of this great body, who, till a period subsequent to the rebellion of 1745, seem to have had the support of the more influential portion of the people. After that period, when the Stuart claims ceased to have any effect in keeping the crown in check, a division appears to have grown up between the government and the people, which was manifested in various forms even before the demise of George II., but broke out in a very violent manner during the early years of his successor. George III., who had imbibed high notions of the royal prerogative from the Earl of Bute, showed, from the beginning of his reign, an anxious desire to extend the power of the crown, to shake off the influence of the great Whig families, and keep popular force of all kinds within strict limits.

A stranger, with no connection in the country, a favourite, and moreover a man of unprepossessing manners, the Earl of Bute had neither the support of the aristocracy nor of the people. He was assailed in Parliament, and through the newspapers, with the most violent abuse, the unpopular peace furnishing a powerful topic against him. To this storm he at length yielded, by retiring (April 8, 1763).

Among the public writers who assailed the ministry, none was more virulent than Mr. John Wilkes, member for Ailesbury, and editor of a paper entitled the *North Briton*. Mr. George Grenville, who succeeded Bute, commenced his career by prosecuting Wilkes for a libel, contained in the forty-fifth number of his paper, in which he had directly accused his majesty of falsehood. The king's messenger, being provided with a general warrant against the editor, printers, and publishers of the *North Briton*, entered the house of Mr. Wilkes, and apprehended him. After being examined before the secretaries of state, he was committed to the Tower, and his papers were seized and sealed up. A few days after, he was brought to Westminster Hall by *habeas corpus*, and released by Chief Justice Pratt, in consideration of his being a member of Parliament. The Parliament ordered the seditious paper to be burnt by the hands of the common hangman—an operation that produced a riot, not in itself dangerous, but serving to discover the angry spirit of the populace. Mr. Wilkes was soon after expelled from the House of Commons, and found it convenient to retire to the continent. One result of his case was favourable to the popular cause: a prosecution which he instituted against the secretary of state, on the plea that his seizure was illegal, terminated in a verdict of damages, and a declaration by Chief Justice Pratt, that general warrants were inconsistent with the laws of England.

AMERICAN STAMP ACT.

The administration of Mr. Grenville is memorable for the first attempt to tax the American colonies. An act, passed under his influence (March 1765) for imposing stamps on those countries, appeared to the colonists as a step extremely dangerous to their liberties, considering that they had no share in the representation. They therefore combined almost universally to resist the introduction of the stamped paper by which the tax was to be raised. Resolutions were passed in the various assemblies of the states, protesting against the assumed right of the British legislature to tax them. Partly by popular violence, and partly by the declarations issued by the local legislative assemblies, the object of the act was completely defeated.

The home government were then induced to agree to the repeal of the act, but with the reservation of a right to impose taxes on the colonies. Between the Stamp Act and its repeal, a change had taken place in the administration: the latter measure was the act of a Whig ministry under the Marquis of Rockingham, which, how

ever, did not long continue in power, being supplanted by one in which Mr. Pitt, now created Earl of Chatham, held a conspicuous place. The second Pitt administration was less popular than the first; the Earl of Chesterfield, reflecting on the title given to the minister, at the same time that he sunk in general esteem, called his rise a *fall up stairs*. All the ministries of this period laboured under a popular suspicion, probably not well founded, that they only obeyed the will of the king, while the Earl of Bute, as a secret adviser behind the throne, was the real though irresponsible minister.

At the suggestion of Mr. Charles Townsend, a member of the Earl of Chatham's cabinet, it was resolved, in 1767, to impose taxes on the Americans in a new shape, namely, upon British goods imported into the colonies, for which there was some show of precedent. An act for imposing duties on tea, glass, and colours, was accordingly passed with little opposition. Soon after this, Mr. Townsend died, and the Earl of Chatham, who had been prevented by illness from taking any share in the business, resigned. The Americans met the new burdens with the same violent opposition as formerly.

THE WILKES TUMULTS.

Early in 1768, a new administration was formed under the Duke of Grafton, a pupil of Chatham, and soon after a new Parliament was called. At the general election, Mr. Wilkes re-appeared in England, though a sentence of outlawry still stood against him. He even ventured to become candidate for the county of Middlesex, where he was returned by a large majority. Having previously surrendered to the jurisdiction of the King's Bench, his outlawry was reversed; but by virtue of the verdicts which two courts had given against him, he was subjected to a fine and two years' imprisonment. On his arrest, Mr. Wilkes quietly committed himself to the officers of justice, but was forcibly rescued by the populace; and in a riot subsequent to this violence, a young man, who had no participation in the tumult, was killed. During his imprisonment, Mr. Wilkes was formally expelled the House, on the pretext that, by the vote of censure passed by the preceding Parliament, he was for ever disqualified from being a representative of the people. This decision incensed a great portion of the community, and the case became identified in their estimation with the liberties of the nation itself. Four times did the county of Middlesex return Mr. Wilkes; but the rival candidate, Colonel Luttrell, with only a fourth of the votes, was accepted by the House.

These proceedings occasioned many keen debates in the House of Commons, where an opposition of much talent and ardour of purpose now took up every popular question. Tumults of a dangerous character were constantly taking place; the cry of "Wilkes and Liberty" resounded everywhere, excepting only in Scotland, his scurrility against the Scotch having rendered him generally detested in that country. Even the municipal bodies and corporations, though usually not easily moved by popular objects, became zealous partisans of Mr. Wilkes, and thought it their duty to remonstrate with the king on the high hand with which his government was conducted. At this agitated time (1769), an unknown writer, styling himself Junius, commenced a series of letters in a newspaper, animadverting in the most virulent manner on both the men and measures of the government. These compositions were the more remarkable, as, from the force and elegance of their style, they were evidently the production of some person, not only far above the usual character of newspaper writers, but fitted to rank with the first intellects of his day. The publisher of the newspaper was prosecuted for publishing them; but the author remained concealed, and his name, though still an object of curiosity, has never been discovered.

MINISTRY OF LORD NORTH—THE CITY OF LONDON'S REMONSTRANCE.

At the opening of Parliament in January, 1770, it was expected that the conspicuous topic in the king's speech would be the Middlesex election. The surprise was general when it was found that the king did not make the least reference to the troubles respecting Mr. Wilkes. The opposition were enraged at this oversight, and moved, as an amendment to the address, that an inquiry ought to be made into the causes of the prevailing discontents; on which occasion, Charles James Fox, afterwards so celebrated as a political leader, made his first speech in Parliament. The amendment was negatived by 254 against 138, which showed that the king was quite secure of the support of the House of Commons.

At this time, the Duke of Grafton retired from the cabinet, and his place was supplied by Lord North, son of the Earl of Guilford. The new ministry was tenth which had existed during as many years, but the first in which the king might be considered as completely free of the great Whig families, who, by their Parliamentary influence, had possessed the chief power since the Revolution. This was the beginning of a series of Tory administrations, which, with few and short intervals, conducted the affairs of the nation down to the close of the reign of George IV

The supposed injury which the cause of free election had sustained from the decision of the House of Commons, still for a time agitated the public mind. Forty-eight peers, including all the great Whig chiefs (Devonshire, Rockingham, rosvenor, Fitzwilliam, Tankerville, King, &c.), besides the Earl of Chatham, made a public declaration that they should not cease their efforts till they had obtained full justice to the electors of Britain. The city of London, and some other corporations of note, presented remonstrances to the king on the same subject. The policy of the king and cabinet was to wear ou the public fervour by dignified silence. No notice as therefore taken of these remonstrances. Under the policy of the king, the Wilkes agitations in time subsided.

THE AMERICAN WAR OF INDEPENDENCE.

Meanwhile, the remonstrances of the American colonists had induced the ministry to give up all the new taxes, excepting only that on tea, which it was determined to keep up, as an assertion of the right of Parliament to tax the colonies. In America, this last remaining tax continued to excite as much discontent as the whole had formerly done, for it was the principle of a right to impose taxes which they found fault with, and not the amount of the tax itself. The discontent with the mother country was found to affect trade considerably and the British merchants were anxious to bring the dispute to a close. The government was then induced to grant such a drawback from the British duty on tea, as enabled the East India Company to offer the article in America at a lower rate than formerly, so that the American duty, which was only threepence a pound, did not affect the price. It was never doubted that this expedient would satisfy the colonists, and large shipments of tea were accordingly sent out from the British ports. But the principle of the right to tax still lurked under the concession, and the result only showed how little the sentiments of the Americans were understood.

The approach of the tea cargoes excited them in a manner totally unlooked for in Britain. At New York and Philadelphia, the cargoes were forbidden to land. In Charlestown, where they were permitted to land, they were put into stores, and prohibited from being sold. At Boston, a ship-load, which had been introduced into the

harbour, was seized by a lawless mob, and tossed into the sea. This last act of violence was resented by the passing of a bill in Parliament for interdicting all commercial intercourse with the port of Boston, and another for taking away the legislative assembly of the state of Massachusetts. The former measure was easily obviated by local arrangements; and in reference to the latter, a Congress of representatives from the various states met at Philadelphia, in September, 1774, when it was asserted that the exclusive power of legislation, in all cases of taxation and internal policy, resided in the provincial legislatures. The same assembly denounced other grievances, which have not here been particularly adverted to, especially an act of the British legislature for trying Americans, for treasonable practices, in England. The Congress also framed a covenant of non-intercourse, by which the whole utility of the colonies to the mother country, as objects of trading speculation, was at once laid prostrate. The colonists still avowed a desire to be reconciled, on the condition of a repeal of the obnoxious statutes. But the government had now resolved to attempt the reduction of the colonists by force of arms. Henceforth, every proposal from America was treated with a proud silence on the part of the British monarch and his advisers.

The war opened in summer, 1775, by skirmishes between the British troops and armed provincials, for the possession of certain magazines. At the beginning there seemed no hope of the contest being protracted beyond one campaign. The population of the colonies was at this time under three millions, and they were greatly inferior in discipline and appointments to the British troops. They possessed, however, an indomitable zeal in the cause they had agreed to defend, and fought with the advantage of being in the country of their friends. At Bunker's Hill, near Boston (June 17, 1775), they had the superiority in a well-contested fight with the British troops, of whom between two and three hundred were killed. At the end of one year the British government was surprised to find that no progress had been made towards a reduction of the Americans, and sent out an offer of pardon to the colonists, on condition that they would lay down their arms. The proposal only met with ridicule.

On the 4th of July, 1776, the American Congress took the decisive step of a declaration of their independence, imbodying their sentiment in a document remarkable for its pathos and solemnity. During the next two campaigns, the slender forces of the new republic were hardly able anywhere to face the large and well-appointed armies of Great Britain. Much misery was endured by this hardy people in resisting the British arms. Notwithstanding every disadvantage and many defeats, America remained unsubdued.

The first serious alarm for the success of the contest in America, was communicated in December, 1777, by intelligence of the surrender of an army under General Burgoyne at Saratoga. In the House of Commons, the ministers acknowledged this defeat with marks of deep dejection, but still professed to entertain sanguine hopes, from the vigour with which the large towns throughout Britain were now raising men at their own expense for the service of the government. Mr. Fox, the leader of the opposition, made a motion for the discontinuance of the war, which was lost by 165 to 259, a much narrower majority than any which the ministry had before reckoned in the Lower House.

In proportion to the dejection of the government, was the elation of the American Congress. Little more than two years before, the British sovereign and ministers had treated the petitions of the colonists with silent contempt; but such had been the current of events, that, in 1778, they found it necessary, in order to appease the popular discontent to send out commissioners, almost for the purpose of begging a peace. As if to avenge themselves for the indignities of 1775, the Americans received these commissioners with the like haughtiness; and, being convinced that they could secure their independence, would listen to no proposals in which the acknowledgment of that independence, and the withdrawal of the British troops, did not occupy the first place. The ministers, unwilling to submit to such terms, resolved to prosecute the war, holding forth to the public, as the best defence of their conduct, the necessity of curbing the spirit of insubordination, both in America and at home, which they described as threatening the overturn of the most sacred of the nations' institutions.

The rise of Great Britain during the seventeenth and eighteenth centuries, in wealth and military and naval power, had been observed by many of the surrounding states with no small degree of jealousy. France, in particular, had not yet forgiven the triumphant peace which Britain had dictated in 1763. The Americans, therefore, by their emissary, the celebrated Benjamin Franklin, found no great difficulty in forming an alliance with France, in which the latter power acknowledged the independence of the colonists, and promised to send them large auxiliary forces. Viewing the distressed state to which Britain was reduced by the contest, and concluding that the time had arrived to strike a decisive blow for her humiliation, Spain soon after declared war against her; and in 1780, Holland was added to the number of her enemies. Russia then put herself at the head of what was called an Armed Neutrality, embracing Sweden and Denmark, the object of which was indirectly hostile to Britain. So tremendous was the force reared against Britain in 1779, even before all these powers had entered into hostilities, that it required about three hundred thousand armed men, three hundred armed vessels, and twenty millions of money annually, merely to protect herself from her enemies. Even her wonted superiority at sea seemed to have deserted her; and for some time the people beheld the unwonted spectacle of a hostile fleet riding in the Channel, which there was no adequate means of opposing.

It was now obvious to the whole nation, that this contest, upon whatever grounds it commenced, was a great national misfortune; and the Opposition in Parliament began to gain considerably in strength. After some votes, in which the ministerial majorities appeared to be gradually lessening, Mr. Dunning, on the 6th of April, 1780, carried, by a majority of eighteen, a motion, "that the influence of the crown had increased, was increasing, and ought to be diminished." This was looked upon as a severe censure of the government, considering that the House of Commons was not altogether a popular body, but included many who had seats there only through the influence of the crown, or by the favour of the nobility and gentry.

In the year 1778, an act had been passed, relieving the Roman Catholics in England from some of the severe penal statutes formerly enacted against them. The apprehension of a similar act for Scotland caused the people of that country to form an immense number of associations, with a view to opposing it; and, in the early part of 1779, the popular spirit broke out at Edinburgh and Glasgow in several alarming riots, during which one or two Catholic chapels, and some houses belonging to Catholics, were pillaged and burnt. An extensive Protestant Association was also formed in England, to endeavour to procure the repeal of the English act. This body was chiefly led by Lord George Gordon, a son of the late Duke of Gordon, and member of the House of Commons. In June, 1780, an immense mob assembled in London to accompany Lord George to the House of Commons, where he was to present a

petition against the act, signed by 120,000 persons. His motion for the repeal of the act being rejected by a vast majority, he came out to the lobby and harangued the crowd in violent terms, suggesting to them similar acts to those which had taken place in Scotland. The mob accordingly proceeded to demolish the chapels of the foreign ambassadors. Meeting with no effectual resistance, for the magistrates of the city were afraid to take decisive measures against them, they attacked Newgate, released the prisoners, and set the prison on fire. The new prison at Clerkenwell, the King's Bench and Fleet Prisons, and the New Bridewell, were treated in like manner. At one time, thirty-six fires were seen throughout the city. The mob had uncontrolled possession of the streets for five days, pillaging, burning, and demolishing; until the king in council determined to authorize the military to put them down by force of arms. Tranquillity was then restored, but not before upwards of 400 persons were killed and wounded. Many of the ringleaders were convicted and executed. Lord George Gordon was tried for high treason, but acquitted on a plea of insanity, which his subsequent life showed to be well founded. Similar outrages were attempted in other cities, but prevented by the vigour of the magistrates. The chief sufferers from these riots were the party who aimed at political reforms. On the other hand, the king obtained increased respect, in consequence of the firmness he had shown in taking measures for the suppression of the riots.

The states of North and South Carolina, which contained a larger proportion of persons friendly to the British crown than any of the northern states, had submitted, in 1780, to a British army under General Clinton. Next year, the greater part of the troops which had been left in those states were conducted northward by Lord Cornwallis, in the hope of making further conquests; but the consequence was that General Greene, after a series of conflicts in which he greatly distressed various parties of the British troops, regained both Carolinas, while Lord Cornwallis took up a position at Yorktown in Virginia. At this time, General Washington, the American commander-in-chief, to whose extraordinary sagacity and purity of motives the colonists chiefly owed their independence, was threatening General Clinton's army at New York. Clinton tamely saw him retire to the southward, believing that he only meant to make a feint, in order to draw away the British from New York, when he in reality meant to attack Cornwallis. On the 29th of September (1781), Yorktown was invested by this and other corps of Americans and French; and in three weeks more, the British batteries being completely silenced, Lord Cornwallis surrendered, with his whole army. With this event, though some posts were still kept up by British troops, hostilities might be said to have been concluded.

At the next opening of Parliament, many of those who had formerly supported the war, began to adopt opposite views; and, early in 1782, a motion, made by General Conway, for the conclusion of the war, was carried by a majority of nineteen. The necessary consequence was, that, on the 20th of March, Lord North and his colleagues resigned office, after twelve years of continued misfortune, during which the prosperity of the country had been retarded, a hundred millions added to the national debt, and three millions of people separated from the parent state.

As usual in such cases, a new administration was formed out of the Opposition. The Marquis of Rockingham was made prime minister, and Mr. Fox one of the secretaries of state. The new ministers lost no time in taking measures for the restoration of peace. Unfortunately for their credit with the nation, Sir George Rodney gained an important victory over the French fleet off the island of Dominica, April 12, 1782, after the ministers had despatched another officer to supersede him in the command. On this occasion, thirty-seven British vessels encountered thirty-four French, and, chiefly by the dexterous manœuvre of a breach of the enemy's line, gained one of the most complete victories recorded in modern warfare. The triumph was eminently necessary, to recover in some measure the national honour, and enable the ministers to conclude the war upon tolerable terms. In November, provisional articles for a peace with the United States of America, now acknowledged as an independent power, were signed at Paris, and the treaty was concluded in the ensuing February. When the American ambassador was afterwards, for the first time, introduced at the British levee, the king received him kindly, and said, with a manly frankness, that though he had been the last man in his dominions to desire that the independence of America should be acknowledged, he should also be the last to wish that that acknowledgment should be withdrawn. War was soon after concluded with France, Spain, and Holland, but not without some considerable concessions of colonial territory on the part of Great Britain.

The conclusion of this war is memorable as a period of great suffering, arising from the exhaustion of the national resources, the depression of commerce, and the accident of a bad harvest. The principles of prosperity were after all found to be so firmly rooted in the country, that, immediately after the first distresses had passed away, every department of the state resumed its wonted vigour; and, during the ensuing ten years of peace, a great advance was made in national wealth.

On the unexpected death of the Marquis of Rockingham, in July, 1782, the king chose as his successor the Earl of Shelburne, who, though nominally a Whig, was not sufficiently inclined to the general measures of that party to be agreeable to Mr. Fox and other leading members of the cabinet. On their consequent resignation, the vacancies were filled up by the friends of Shelburne, among whom was Mr. William Pitt, a younger son of the Earl of Chatham. This young statesman, to whom was assigned the office of chancellor of the exchequer, had already distinguished himself by the part he took in the popular proceedings for a reform of the House of Commons—an object which the opposition and their supporters had for some years advocated with great zeal, but which soon after fell in a great measure out of public notice.

COALITION MINISTRY.

The present ministry was opposed by two parties of very different principles, namely, the adherents of the North administration, and the friends of those Whigs who had lately retired from the cabinet. These two parties, notwithstanding that they had been opposed to each other throughout all the late war, coalesced for factious or ambitious purposes; and, being triumphant over the ministry, forced themselves upon the king's counsels. Then was formed (April 2, 1783) what was called the Coalition Ministry, in which Lord North and Mr. Fox acted together as secretaries of state, though two years had hardly elapsed since the latter had breathed the most violent threats in Parliament against his present associate. A coalition, in which political principle was supposed to be abandoned for the sake of office, could not be agreeable to the nation, while it was evidently embarrassing to the sovereign. Mr. Fox had prepared and carried through the Lower House his famous bill for the regulation of the East India Company, by which all authority was to devolve on seven directors chosen by the House of Commons; in other words, by which the immense patronage of this offshoot of the empire was to fall into the hands of the ministry. The India bill, as it was called, was generally supposed to aim at fixing the ministry in power beyond the control of both king and

people, and it accordingly roused much indignation. His majesty, therefore, fully confident of support from the people, used his personal influence, in no covert way, to induce the House of Lords to reject the bill, and (December 18) sent a messenger to demand the seals of office from his over-ambitious ministers, appointing Mr. Pitt to be the prime minister and chancellor of the exchequer of a new cabinet, consisting chiefly of his majesty's friends.

The various departments of the state were now thrown into a relative position, which had never been known before, and has never recurred. The king and his ministers, backed by a decided majority of the public, were opposed by two powerful aristocratic factions in the House of Commons, who defeated every measure that was introduced, refused the usual supplies, and voted again and again resolutions against the continuance of the present men in office, which they denounced as unconstitutional. But in the course of a few weeks, the influence of the opposition was sensibly reduced; the public sentiment and the power of the court began to take effect even on this intractable body; and when at length their majority had been worn down to *one*, which happened on a motion by Mr. Fox, the king dissolved the Parliament—a measure which, whatever it might promise to him, he did not previously think justifiable. So far were the votes of the coalition from being based on popular support, that in the new election, no fewer than one hundred and sixty members lost their seats. The new House of Commons was so favourable towards the king and ministry, as to enable the public service to go on without further interruption.

LEGISLATIVE MEASURES IN IRELAND.

From the end of the reign of George I., a patriotic party in Ireland, composed of a mixture of Catholics and Protestants, had been exerting itself to reduce the influence of the English ministry in their country. The resistance of the American colonists gave a powerful stimulus to this body; and, on some alarm of an invasion of the French, they found a pretext for taking up arms, apparently for the protection of the country, but in reality to render themselves formidable to England. Encouraged by Parliament, and headed by the principal men in the country, the Volunteer Corps, as they were called, held meetings and passed resolutions, in which they openly avowed their determination, at the hazard of life and fortune, to achieve the independence of the native legislature, and a complete participation in the commercial rights of the British. The government, being then too feeble to resist, bowed to their demands. Poyning's law, and others which had given the English Parliament a right to interfere with Ireland, were repealed; and acts were passed for the right of *habeas corpus* and the independence of the judges. In November, 1783, the volunteers held a grand convention in Dublin, and proposed to urge the question of Parliamentary reform; but the government now began to regain strength, and in a short time, by skilful measures, it prevailed upon the corps to dissolve.

MINISTRY OF MR. PITT—FROM 1784 TO THE COMMENCEMENT OF THE FRENCH REVOLUTION.

Though the favourite minister of a sovereign decidedly opposed to all popular innovations, Mr. Pitt continued to profess his former zeal for a reform in the House of Commons; but, as might be expected, was unable to bring the power of the government to bear upon the subject. In April, 1785, he asked leave of the House to bring in a bill for this object; but it was refused by a large majority. The desire of Parliamentary reform nevertheless continued to animate a large portion of the community. In 1784, a regular society had been instituted in Scotland, for the purpose of obtaining such a measure; and in the succeeding year, forty-nine out of the sixty six boroughs had declared in favour of it. There were also numerous associations of a similar character in England.

In 1786, Mr. Pitt established his celebrated but fallacious scheme for redeeming the national debt, by what was called a Sinking Fund. The revenue was at this time above fifteen millions, being about one million more than was required for the public service. This excess he proposed to lay aside annually, to lie at compound interest; by which means he calculated that each million would be quadrupled at the end of twenty-eight years, and thus go a great way towards the object he had in view. To this scheme Mr. Fox added the infinitely more absurd amendment, that, when the government required to borrow more money, one million of every six so obtained should be laid aside for the same purpose. The scheme was so well received as to increase the popularity of the minister, and it was not till 1813 that its fallacy was proved.

In the same year commenced the Parliamentary proceedings against Mr. Warren Hastings, for alleged cruelty and robbery exercised upon the natives of India during his governorship of that dependency of Great Britain. These proceedings were urged by Mr. Burke and other members of the Whig party, and excited so much public indignation against Mr. Hastings, that the ministry was obliged, though unwillingly, to lend their countenance to his trial, which took place before Parliament in the most solemn manner, and occupied one hundred and forty-nine days, extending over a space of several years. The result was the acquittal of Mr. Hastings.

The king and the queen had, in the mean time, become the parents of a numerous family of sons and daughters. The eldest son, George, Prince of Wales, had now for several years been of age, and exempted from the control of his father. He had no sooner been set up in an establishment of his own, than he plunged into a career of prodigality, forming the most striking contrast with the chastened simplicity and decorum of the paternal abode. He also attached himself to the party of the Opposition, though rather apparently from a principle of contradiction to his father, than a sincere approbation of their political objects. The result was the complete alienation of the Prince of Wales from the affections of the king.

In November, 1788, an aberration of intellect, resulting from an illness of some duration, was observed in the king, and it became necessary to provide some species of substitute for the exercise of the royal functions. To have invested the Prince of Wales with the regency, appeared the most obvious course; but this would have thrown out the ministry, as it was to be supposed that his royal highness would call the chiefs of his own party to his councils. Mr. Fox contended that the hereditary nature of the monarchy pointed out an unconditional right in the prince to assume the supreme power under such circumstances; but Mr. Pitt asserted the right of Parliament to give or withhold such an office, and proposed to assign certain limits to the authority of the intended regent, which would have placed the existing ministry beyond his reach. The Irish Parliament voted the unconditional regency to the prince; but that of Great Britain was about to adopt the modified plan proposed by Mr. Pitt, when, March, 1789, the king suddenly recovered, and put an end to the difficulty. The debates on the regency question show ... very strong light how statesmen will sometimes abandon their most favourite and strongest principles on the call of their own immediate interests.

MISCELLANEOUS CIRCUMSTANCES FROM 1760 TO 179[illegible].

At the beginning of the reign of George III., both the commerce and the manufactures of the country might be

considered as in a highly flourishing condition. Scotland was not now, as formerly, exempt from the general prosperity. In that country, since the year 1746, great improvements of various kinds had taken place: the linen manufacture had been much advanced; a trade with the colonies had sprung up; agriculture was undergoing great changes for the better; the Highlands were now peaceful, and throughout the whole country were seen conspicuous symptoms of increasing wealth, and its natural consequence, refinement of manners.

During the first ten years of the reign of George III., some discoveries and inventions were made, by which the prosperity of the whole empire received a new impulse. By the improvements effected in the steam-engine by Mr. James Watt, a superior mechanic power was obtained for the driving of machinery and other purposes. Mr. James Hargreaves of Blackburn invented the *spinning-jenny*, a contrivance for abridging the use of hand-labour in the cotton manufacture. Upon this an improvement was afterwards made by Mr. Richard Arkwright, who invented what was called the *spinning-frame*, by which a vast number of threads of the utmost fineness were spun with very little aid from hand-labour. A third invention, called the *mule-jenny*, by Mr. Crompton of Bolton, came into use some years later; and, finally, the *power-loom* was invented, for superseding hand-labour in weaving. By these means, the cotton manufacture was brought to a pitch of prosperity in Britain, such as no particular branch of manufacture had ever experienced before in any country. The immense wealth produced by it is allowed to have been what chiefly enabled the nation to sustain the great contest in which it was afterwards involved with France. Considering these results, the original condition of the principal persons concerned in improving the manufacture is remarkable. Mr. Watt, who gave it a mechanic force in the steam-engine, was an artisan in his early days: Mr. Hargreaves was a carpenter; and Mr. Arkwright a dresser of hair. The last, who was knighted by George III., left, at his death, nearly a million sterling, realized by the profits of his invention.

The early part of the reign of George III. was distinguished by the discoveries of Captain Cook in the Pacific Ocean, by the formation of many canals for internal navigation, and by the foundation of the Royal Academy for the Promotion of the Fine Arts. This period derives lustre from the admirable paintings of Barry, Blake, Hoppner, and Reynolds. Astronomy was cultivated by Dr. William Herschel, who in 1781 discovered the planet Uranus. Chemistry was improved by Dr. Joseph Black and Mr. Cavendish. The science of medicine was advanced by Dr. Cullen of Edinburgh; and natural history by Sir Joseph Banks. In literature, the chief place is due to Dr. Samuel Johnson, who had flourished also in the preceding reign. Oliver Goldsmith, Mark Akenside, and William Cowper, were the most eminent poets. History was written in a masterly manner by William Robertson and David Hume; Henry Home, David Hume, and Adam Smith, figure as philosophical writers; Sir William Blackstone wrote on English law; and among divines, the most eminent were Bishops Warburton, Jortin, and Hurd.

FRENCH REVOLUTION, AND CONSEQUENT WAR WITH FRANCE.

The country had for several years experienced the utmost prosperity and peace, when it was roused by a series of events which took place in France. The proceedings of the French nation for redressing the political grievances under which they had long laboured, commenced in 1789, and were at first very generally applauded in Britain, as likely to raise that nation to a rational degree of freedom. Ere long, the violence shown at the destruction of the Bastile, the abolition of hereditary privileges, the open disrespect for religion, and other symptoms of an extravagant spirit, manifested by the French, produced a considerable change in the sentiments of the British people. The proceedings of the French were still justified by the principal leaders of Opposition in Parliament, and by a large class of the community; but they inspired the government, and the propertied and privileged classes generally, with great alarm and distrust.

When at length the coalition of Austria and Prussia with the fugitive noblesse had excited the spirit of the French people to a species of frenzy, and led to the establishment of a republic and the death of the king, the British government and its supporters were effectually roused to a sense of the danger which hung over all ancient institutions, and a pretext was found (January, 1793) for declaring war against France. A comparatively small body of the people were opposed to this step, which was also loudly deprecated in Parliament by Messrs. Fox and Sheridan; but all these remonstrances were drowned in the general voice of the nation. At such a crisis, to speak of political reforms in England seemed the height of imprudence, as tending to encourage the French. All, therefore, who continued to make open demonstrations for that cause, were now branded as enemies to religion and civil order. In Scotland, Mr. Thomas Muir, a barrister, and Mr. Palmer, an Unitarian clergyman, were tried for sedition, and sentenced to various terms of banishment. Citizens named Skirving, Gerald, and Margarot, were treated in like manner by the Scottish criminal judges, for offences which could only be said to derive the character ascribed to them from the temporary and accidental circumstances of the nation. An attempt to inflict similar punishments upon the English reformers, was defeated by the acquittal of a shoemaker named Hardy; but the party was nevertheless subjected, with the apparent concurrence of a large and influential portion of the people, to many minor severities.

After alliances had been formed with the other powers hostile to France, the British ministers despatched an army to the Netherlands, under the command of the king's second son, the Duke of York, to co-operate in reducing the fortresses in possession of the French, while the town of Toulon, being inclined to remain under the authority of the royal family, put itself into the hands of a British naval commander. At first, the French seemed to fail somewhat in their defences; but on a more ardently republican party acceding to power under the direction of the famous Robespierre, the national energies were much increased, and the Duke of Brunswick experienced a series of disgraceful reverses. The Prussian government, having adopted new views of the condition of France, now began to withdraw its troops, on the pretext of being unable to pay them; and though Britain gave nearly a million and a quarter sterling to induce this power to remain nine months longer upon the field, its co-operation was of no further service, and was soon altogether lost. On the 1st of June, 1794, the French Brest fleet sustained a severe defeat from Lord Howe, with the loss of six ships; but the republican troops not only drove the combined armies out of the Netherlands, but, taking advantage of an unusually hard frost, invaded Holland by the ice which covered the Rhine, and reduced that country to a republic under their own control. The successes of the British were limited to the above naval victory, the temporary possession of Corsica and Toulon, the capture of several of the French colonies in the West Indies, and the spoliation of a great quantity of the commercial shipping of France; against which were to be reckoned the expulsion of an army from the Netherlands, the loss of 10,000 men and 60,000 stand of arms in an unsuccessful descent upon the west coast of France, some considerable losses of shipping,

and an increase of annual expenditure from about fourteen to nearly forty millions.

In the course of the year 1795, the lower portions of the community began to appear violently discontented with the progress of the war, and to renew their demands for reform in the state. As the king was passing (October 29) to open the session of Parliament, a stone was thrown into his coach, and the interference of the horse guards was required to protect his person from an infuriated mob. The ministers consequently obtained acts for more effectually repressing sedition, and for the dispersion of political meetings. They were at the same time compelled to make a show of yielding to the popular clamours for peace; and commenced a negotiation with the French Directory, which was broken off by the refusal of France to restore Belgium to Austria. In the ensuing year, so far from any advance being made towards the subjugation of France, the northern states of Italy were overrun by its armies, and formed into what was called the Cisalpine Republic. The celebrated Napoleon Bonaparte made his first conspicuous appearance as the leader of this expedition, which terminated in Austria submitting to a humiliating peace. At the close of 1796, a French fleet sailed for Ireland, with the design of revolutionizing that country, and detaching it from Britain; but its object was defeated by stress of weather. At this crisis, a new attempt was made to negotiate with the French Republic; but as the events of the year had been decidedly favourable to France, a renewed demand of the British for the surrender of Belgium was looked upon as a proof that they were not sincere in their proposals, and their agent was insultingly ordered to leave the French territory. To add to the distresses of Britain, while Austria was withdrawn from the number of her allies, Spain, by a declaration of war in 1797, increased in no inconsiderable degree the immense force with which she had to contend.

THREATENED INVASION—SUBSEQUENT EVENTS.

For some time an invasion of Britain had been threatened by France; and, sacred as the land had been for centuries from the touch of a foreign enemy, the successes of the republicans had hitherto so greatly exceeded all previous calculation, that the execution of their design did not appear improbable. Just as the interference of the neighbouring powers had, in 1792, roused the energies of the French, so did this proposed invasion stimulate the spirit of the British people. The clamours of reformers, and of those who were friendly to France, were now lost in an almost universal zeal for the defence of the country; and not only were volunteer corps everywhere formed, but the desire of prosecuting the war became nearly the ruling sentiment of the nation. The ministers, perceiving the advantage which was to be derived from the tendency of the national spirit, appeared seriously to dread an invasion, and thus produced an unexpected and very distressing result. The credit of the Bank of England was shaken; a *run* was made upon it for gold in exchange for its notes, which it could not meet. On the 25th of February, 1797, therefore, the bank was obliged, with the sanction of the privy-council, to suspend cash payments, that is, to refuse giving coin on demand for the paper money which had been issued. This step led to a great depreciation in the value of Bank of England notes, and a very serious derangement of the currency ensued for a number of years.

In April, a new alarm arose from the proceedings of the seamen on board the Channel fleet, who mutinied for an advance of pay, and the redress of some alleged grievances. A convention of delegates from the various ships met in Lord Howe's cabin, and drew up petitions to the House of Commons and the Board of Admiralty. Upon these being yielded to, order was restored; but the seamen on board the fleet at the Nore soon after broke out in a much more alarming revolt; and, on the refusal of their demands, moored their vessels across the Thames, threatening to cut off all communication between London and the open sea. The reduction of this mutiny appeared at one time as if it could only be effected by much bloodshed; but by the firmness of the government, and some skilful dealings with the seamen, a loyal party was formed, by whom the more turbulent men were secured, and the vessels restored to their officers. The ringleaders, the chief of whom was a young man named Richard Parker, were tried and executed.

The same year was remarkable for several victories gained by the British fleets. A Spanish fleet of twenty-seven ships was attacked by fifteen vessels under Admiral Jervis (February 14), off Cape St. Vincent, and completely beaten, with the loss of four large vessels. A fleet under Admiral Harvey, with a military force under Sir Ralph Abercromby, captured the island of Trinidad, a Spanish colony. In October, a Dutch fleet, under Admiral De Winter, was attacked off the village of Camperdown, upon their own coast, by Admiral Duncan, who, after a desperate battle, captured nine of the enemy's vessels. These naval successes compensated in some measure for the many land victories of the French, and served to sustain the spirit of the British nation under this unfortunate contest.

In 1798, the French overran and added to their dominions the ancient republic of Switzerland, which gave them a frontier contiguous to Austria, and enabled them eventually to act with increased readiness and force upon that country. In this year, the directors of the French republic, beginning to be afraid of the ambition of their general, Bonaparte, sent him at the head of an expedition to reduce and colonize Egypt, intending from that country to act against the British empire in the East Indies. The expedition was successful in its first object; but the fleet which had conveyed it was attacked in Aboukir Bay, by Admiral Nelson (August 1), and almost totally destroyed or captured. While so much of the strength of the French army was thus secluded in a distant country, the eastern powers of Europe thought they might safely recommence war with the republic. Austria, Naples and Russia formed a confederacy for this purpose; and Britain, to supply the necessary funds, submitted to the grievance of an income tax, amounting in general to ten per cent., in addition to all her previous burdens.

The new confederacy was so successful in 1799, as to redeem the greater part of Italy. A Russian army, under the famous Suwaroff, acted a prominent part in the campaign, but, in the end, attempting to expel the French from Switzerland, this large force was nearly cut to pieces in one of the defiles of that mountainous country. In August of the same year, Great Britain made a corresponding attempt to expel the French from Holland. Thirty-five thousand men, under the Duke of York, formed the military part of the expedition. The fleet was successful at the first in taking the Dutch ships; but the army, having landed under stress of weather at an unfavourable place for their operations, was obliged, after an abortive series of skirmishes, to make an agreement with the French, purchasing permission to go back to their country by the surrender of 8000 prisoners from England.

The reverses which France experienced in 1799 were generally attributed to the weakness of the Directory—a council of five, to which the executive had been intrusted. Bonaparte suddenly returned from his army in Egypt, and, by a skilful management of his popularity, overturned the Directory, and caused himself to be appointed the sole depositary of the executive power of the state, under the denomination of First Consul. He immediately wrote a letter to King George, making

overtures of peace, but was answered, by the British secretary, that no dependence could be placed by Great Britain on any treaty with France, unless her government were again consolidated under the Bourbons. Bonaparte, having much reason to wish for peace, made a reply to this note, vindicating France from the charge brought against her, of having commenced a system of aggression inconsistent with the in[illegible]ts of other states, and asserting her right to choos[illegible]wn government—a point, he said, that could not de[illegible]ay be contested by the minister of a crown which was held by no other tenure. But the British government was at this time too much elated by the expulsion of the French army from Italy, and the late changes in the executive, which, in their estimation, betokened weakness, to be immediately anxious for peace.

The events of 1800 were of a very different nature from what had been calculated upon in England. Sir Sidney Smith, who commanded the British forces in Syria, had made a treaty with the French army after it had been left by Bonaparte, whereby it was agreed that the French should abandon Egypt, and retire unmolested to their own country. The British government, in its present temper, refused to ratify this arrangement; and the consequence was a continuance of hostilities. The French overthrew a large Turkish army at Grand Cairo, and made themselves more effectually than ever the masters of the country, so that Britain was obliged to send an army next year, under Sir Ralph Abercromby, to accomplish, at an immense expense and a great waste of human life, what the French had formerly agreed to do. In Europe the presence of Bonaparte produced equally disastrous results. By one of his most dexterous movements, he eluded the Austrians, led an army over the Alps by the Great St. Bernard into the Milanese, and, having gained a decisive victory at Marengo (June 14), at once restored the greater part of Italy to French domination. Contemporaneously with Napoleon's movements, Moreau led another army directly into Germany, overthrew the Austrians in several battles, and advanced to within seventeen leagues of Vienna. These reverses obliged Austria next year to make a peace, by which France became mistress of all Europe west of the Rhine and south of the Adige.

REBELLION IN IRELAND—UNION WITH GREAT BRITAIN.

Although the government had been able, in 1783, to procure a dissolution of the volunteer corps, the bulk of the Irish people continued to express the most anxious desire for such a reform in their parliament as might render it a more just representation of the popular voice. Unable to yield to them on this point, Mr. Pitt endeavoured to appease them by extending their commercial privileges; but his wishes were frustrated, chiefly by the jealousy of the British merchants. A strong feeling of discontent, not only with the government, but with the British connection, was thus engendered in Ireland.

The commencement of the revolutionary proceedings in France excited the wildest hopes of the Irish. Towards the close of the year 1791, they formed an association, under the title of the United Irishmen, comprehending persons of all religions, and designed to obtain "a complete reform of the legislature, founded on the principles of civil, political, and religious liberty." The government from the first suspected this association of meditating an overturn of the state, and took strong measures for keeping it in check. Acts were passed for putting down its meetings, and the secretary, Mr. Hamilton Rowan, was tried, and sentenced to a fine and two years' imprisonment for what was termed a seditious libel. At the same time, some concessions to the popular spirit were deemed indispensable, and the Irish parliament accordingly passed acts enabling Catholics to intermarry with Protestants, to practise at the bar, and to educate their own children.

On discovering that a treasonable correspondence had been carried on with France by some leading persons in the society of United Irishmen, the government was so much alarmed as to send (1794) a Whig lord-lieutenant (Earl Fitzwilliam) to grant further concessions; but, ere any thing had been done, the ministers were persuaded by the Protestant party to return to their former policy. The patriotic party now despaired of effecting any improvement by peaceable means, and an extensive conspiracy was entered into for delivering up Ireland to the French republic. The scheme was managed by a directory of five persons, and though half a million of men were concerned in it, the most strict secrecy was preserved. In December, 1796, a portion of the fleet which had been fitted out by the French to cooperate with the Irish patriots, landed at Bantry Bay; but measures for a rising of the people not being yet ripe, it was obliged to return. Next year, the losses at Camperdown crippled the naval resources of France, and prevented a renewal of the expedition. Losing all hope of French assistance, the conspirators resolved to act without it; but their designs were betrayed by one Reynolds; and three other members of the directory, Emmet, Macnevin, and Bond, were seized. Notwithstanding the precautionary measures which the government was thus enabled to take, the Union persisted in the design of rising on a fixed day. Lord Edward Fitzgerald, another of its leaders, was then arrested, and, being wounded in a scuffle with his captors, soon after died in prison. On the 21st of May, 1798, Lord Castlereagh, secretary to the lord-lieutenant, disclosed the whole plan of insurrection, which had been fixed to commence on the 23d.

Though thus thwarted in their designs, and deprived of their best leaders, the conspirators appeared in arms in various parts of the country. Parties attacked Naas and Carlow, but were repulsed with loss. A large party, under a priest named Murphy, appeared in the county of Wexford, and took the city of that name. Slight insurrections about the same time broke out in the northern counties of Antrim and Down, but were easily suppressed. In Wexford alone did the insurgents appear in formidable strength. Under a priest named Roche, a large party of them met and defeated a portion of the government troops; but, on a second occasion, though they fought with resolution for four hours, they were compelled to retreat. Another defeat at New Ross exasperated them greatly, and some monstrous cruelties were consequently practised upon their prisoners. On the 20th of June, their whole force was collected upon Vinegar Hill, near Enniscorthy, where an army of 13,000 men, with a proportionate train of artillery, was brought against them by General Lake. They were completely overthrown and dispersed. From this time the rebellion languished, and in July it had so far ceased to be formidable, that an act of amnesty was passed in favour of all who had been engaged in it, except the leaders.

On the 22d of August, when the rebellion had been completely extinguished, 900 French, under General Humbert, were landed at Killala, in the opposite extremity of the country from that in which the insurgents had shown the greatest strength. Though too late to be of any decisive effect, they gave some trouble to the government. A much larger body of British troops, under General Lake, met them at Castlebar, but retreated in a panic. They then advanced to the centre of the country, while the lord-lieutenant confessed the formidable reputation which their countrymen had acquired, by concentrating an immensely disproportioned force against them. On the 8th of September, they

were met at Carrick-on-Shannon by this large army, to which they yielded themselves prisoners of war.

During the ensuing two years, the British ministers exerted themselves to bring about an incorporating union of Ireland with Great Britain; a measure to which the Irish were almost universally opposed, but which, by the use of bribes and a government patronage liberally employed amongst the members of the Irish legislature, was at length effected. From the 1st of January, 1801, the kingdom of Ireland formed an essential part of the empire, on which was now conferred the name of the United Kingdom of Great Britain and Ireland. The act of union secured to the Irish most of the commercial privileges which they had so long sought. Upon a comparison of the aggregate exports and imports of the two countries, Ireland was to raise two parts of revenue for every fifteen raised by Great Britain, during the first twenty years of the union, after which new regulations were to be made by Parliament. One hundred commoners were to be sent by Ireland to the British (now called the Imperial) Parliament, namely, two for each county, two for each of the cities of Dublin and Cork, one for the university, and one for each of the thirty-one most considerable towns. Four lords spiritual, by rotation of sessions, and twenty-eight lords temporal, elected for life by the Peers of Ireland, were to sit in the House of Lords.

The Union, though upon the whole effected in a spirit of fairness towards Ireland, increased the discontent of the people, which broke out in 1803 in a new insurrection. Under Robert Emmett and Thomas Russell, a conspiracy was formed for seizing the seat of the vice-government, and for this purpose a great multitude of peasantry from the county of Kildare assembled (July 23) in Dublin. Disappointed in their attempt upon the castle, they could only raise a tumult in the streets, in the course of which Lord Kilwarden, a judge, and his nephew, Mr. Wolfe, were dragged from a carriage and killed. The mob was dispersed by soldiery, and Emmett and Russell, being seized, were tried and executed.

CHANGE OF MINISTRY, AND PEACE OF AMIENS, 1801.

At the commencement of 1801, Britain had not only to lament this unexpected turn of fortune, but to reckon among her enemies the whole of the northern states of Europe, which had found it necessary to place themselves on a friendly footing with Bonaparte, and, though they did not declare war against Britain, yet acted in such a manner as to render hostilities unavoidable. Nelson sailed in March, with a large fleet, for Copenhagen, and proved so successful against the Danish fleet, as to reduce that country to a state of neutrality. The death of the Russian Emperor Paul, which took place at the same time, and the accession of Alexander, who was friendly to Britain, completely broke up the northern confederacy. Yet the great achievements of France on the continent, joined to the distresses of a famine which at this time bore hard on the British people, produced a desire for that peace which, a year before, might have been gained upon better terms. With a view, apparently, to save the honour of Mr. Pitt and his friends, a new ministry was appointed under Mr. Addington, by whom a peace was at length, in the end of the year (1801), concluded with France, which was left in the state of aggrandizement which has just been described.

The war of the French Revolution placed Great Britain in possession of a considerable number of islands and colonies in the East and West Indies and elsewhere; and while only two war ships had been lost on her part, she had taken or destroyed 80 sail of the line, 181 frigates, and 224 smaller ships belonging to the enemy, together with 743 privateers, 15 Dutch, and 76 Spanish ships. The triumphs of the British fleets were indeed numerous and splendid, and had the effect of keeping the national commerce almost inviolate during the whole of the war, while that of France was nearly destroyed. There was, however, hardly the most trifling instance of success by land; and the expenses of the contest had been enormous. Previously to 1793, the supplies usually voted by the House of Commons were £14,000,000; but those for 1801 were £42,197,000, being double the amount of the whole land-rent of the country.

WAR RENEWED WITH FRANCE, 1803.—SUBSEQUENT EVENTS.

It was only one of the results of the war against French independence, that France was led by the course of events to place herself under the control of her chief military genius, Napoleon Bonaparte; a man singularly qualified for concentrating and directing the energies of a country in the existing condition of France, but animated more by personal ambition than by any extended views of the good of his species. It was soon manifest that Bonaparte did not relish peace. By taking undue advantage of several points left loose in the treaty, he provoked Great Britain to retaliate by retaining possession of Malta; and the war was accordingly recommenced in May, 1803. Britain immediately employed her superior naval force to seize the French West India colonies; while France took possession of Hanover, and excluded British commerce from Hamburgh. Bonaparte collected an immense flotilla at Boulogne, for the avowed purpose of invading England; but so vigorous were the preparations made by the whole British population, and so formidable the fleet under Lord Nelson, that he never found it possible to put his design in execution. In the year 1804, he was elevated to the dignity of Emperor of the French; and France once more exhibited the formalities of a court, though not of the kind which the European sovereigns wished to see established. In April of the same year, the Addington administration was exchanged for one constructed by Mr. Pitt, and of which he formed the chief.

In 1805, under the fostering influence of Great Britain, a new coalition of European powers, consisting of Russia, Sweden, Austria, and Naples, was formed against Napoleon. He, on the other hand, had drawn Spain upon his side, and was making great exertions for contesting with Britain the empire of the sea. A fleet of thirty-three sail, partly French and partly Spanish, met a British fleet of twenty-seven, under Nelson, off Cape Trafalgar, October 25, 1805, and was completely beaten, though at the expense of the life of the British commander. Britain thus fixed permanently her dominion over the seas and coasts of the civilized world. At this time, however, Napoleon was asserting with equal success his supremacy over continental Europe. By a sudden, rapid, and unexpected movement, he conducted an army into Germany, where the Austrians were already making aggressions upon neutral territory. On the 17th October, he took the fortress of Ulm, with its artillery, magazines, and garrison of 30,000 men; a month after, he entered Vienna without resistance. He then pursued the royal family, and the allied armies of Russia and Austria, into Moravia; and, on the 2d of December, he gained the decisive victory of Austerlitz, which put an end to the coalition, and rendered him the dictator of the continent.

This series of events caused much gloom in the British councils, and with several other painful circumstances, among which was the impeachment of his colleague Lord Melville, for malpractices in the Admiralty, proved a death-blow to Mr. Pitt, who expired on the 23d of January, 1806, completely worn out with state business, at the early age of forty-seven, half of which time he had spent in the public service. Mr. Pitt is universally allowed the praise of high talent and patriotism. But his policy has been a subject of dispute between the

two great parties into which British society is divided. By the Tories it is firmly believed, that his entering into the war against the French republic was the means of saving the country from anarchy and ruin; by the Whigs, that this step only tended to postpone the settlement of the affairs of France, and loaded Britain with an enormous debt. Of the absence of all selfish views in Mr. Pitt, there can be no doubt; for, so far from accumulating a fortune out of the public funds, he left some debts, which Parliament gratefully paid.

Mr. Pitt's ministry was succeeded by one composed of Lord Grenville, Mr. Fox, and their friends; it was comprehensively called Whig, although Lord Grenville was in every respect a Tory, except in his advocacy of the claims of the Catholics for emancipation. In the course of 1806, the new cabinet made an attempt to obtain a peace from France, which now threatened to bring the whole world to its feet. But the Grenville administration encountered serious difficulties from the king, who never could be induced to look with the least favour on the Catholic claims, or those who advocated them. Exhausted by his useless labours, Mr. Fox died, September 13, 1806. Few names are more endeared to the British people than his, for, though the leader of the Whigs, he never excited any rancour in his opponents. He was remarkable for his frankness and simplicity. His abilities as a parliamentary orator and statesman were of the first order, and he was invariably the consistent and sincere friend of popular rights.

A new coalition, excluding Austria, but involving Prussia, had been subsidized by Britain, and was now preparing to act. With his usual decision, Napoleon led what he called his "Grand Army" by forced marches into Prussia; gained, on the 14th of October, the battles of Jena and Averstadt, which at once deprived that country of her army, her capital, and her fortresses; and then proclaimed the famous "Berlin Decree," by which he declared Great Britain in a state of blockade, and shut the ports of Europe against her merchandise. The King of Prussia, Frederick William III., took refuge with his court in Russia, which now was the only continental power of any importance that remained unsubdued by France.

Towards that country Napoleon soon bent his steps, taking, as he went, assistance from Poland, which he promised to restore to independence. After a series of skirmishes and battles of lesser importance, he met the Russian army in great strength (June 14, 1807), at Friedland, and gave it a total overthrow. He might now have easily reduced the whole country, as he had done Austria and Prussia; but he contented himself with forming a treaty (called the treaty of Tilsit, from the place where it was entered into), by which Russia agreed to become an ally of France, and entered into his views for the embarrassment of Britain by the exclusion of her commerce from the continental ports. France had thus, in the course of a few years, disarmed the whole of Europe, excepting Great Britain, an amount of military triumph for which there was no precedent in ancient or modern history.

The Grenville administration was displaced in spring 1807, in consequence of the difference between its members and the king on the subject of the Catholic claims, which had long been urged by the Whig party, with little support from the people. The next ministry was headed by the Duke of Portland, and included Lords Hawkesbury and Castlereagh (afterwards Earl of Liverpool and Marquis of Londonderry), and Mr. Canning, as secretaries; Mr. Spencer Perceval being chancellor of the exchequer. After being accustomed to the services of such men as Pitt and Fox, the people regarded this cabinet as one possessing comparatively little ability. One of its first acts was the despatch of a naval armament to Copenhagen, to seize and bring away the Danish shipping, which was expected to be immediately employed in subserviency to the designs of France, and for the injury of Britain. The end of the expedient was easily gained but it was the means of lowering the honour of Britain in the eyes of foreign states.

FIRST PENINSULAR CAMPAIGN.—SUBSEQUENT EVENTS.

The retaliation of France, for the interferences of other powers with its revolution, even supposing such retaliation justifiable, was now more than completed. Further measures could only appear as dictated by a desire of aggrandizement. But France was now given up to the direction of a military genius, who had other ends to serve than the defence of the country against foreign aggression or interference. The amazing successes of Napoleon had inspired him with the idea of universal empire; and so great was the influence he had acquired over the French, and so high their military spirit, that the attainment of his object seemed by no means impossible. There was a difference, however, between the opposition which he met with before this period, and that which he subsequently encountered. In the earlier periods of the war, the military operations of the European powers were chiefly dictated by views concerning the interests of governments, and in which the people at large felt little sympathy. Henceforth a more patriotic spirit rose everywhere against Napoleon: he was looked upon in England and elsewhere as the common enemy of humanity and of freedom; and every exertion made for the humiliation of France was animated by a sentiment of desperation, in which the governors and governed alike participated.

The Spanish peninsula was the first part of the prostrated continent where the people could be said to have taken a decidedly hostile part against Napoleon. He had there gone so far as to dethrone the reigning family, and give the crown to his elder brother Joseph. A sense of wrong and insult, mingled with religious fanaticism, raised the Spanish people in revolt against the French troops: and though their conduct was everywhere barbarous in the extreme, it was hailed in Britain as capable of being turned to account. In terms of a treaty entered into with a provisional government in Spain, a small army was landed, August 8, 1808, in Portugal, which had been recently taken possession of by the French. Sir Arthur Wellesley, who afterwards became so famous as Duke of Wellington, was the leader of this force. In an engagement at Vimeira, on the 21st, he repulsed the French, under Junot, who soon after agreed, by what was called the Convention of Cintra, to evacuate the country. Sir Arthur being recalled, the British army was led into Spain under the command of Sir John Moore; but this officer found the reinforcements poured in by Napoleon too great to be withstood, and accordingly, in the end of December, he commenced a disastrous though well-conducted retreat towards the port of Corunna, whither he was closely pursued by Marshal Soult. The British army suffered, on this occasion, the severest hardships and losses, but did not experience a check in battle, or lose a single standard. In a battle which took place at Corunna, January 16, 1809, for the purpose of protecting the embarkation of the troops, Sir John Moore was killed.

Much of the public attention was about this time engrossed by circumstances in the private life of the eldest son of the king. The Prince of Wales had been tempted, in 1796, by the prospect of having his large debts paid by the nation, to marry the Princess Caroline of Brunswick, for whom he entertained no affection. Almost ever since the marriage, he had shown the most marked disrespect for his consort, who, consequently, lived separate from him, and was herself considered by many as deficient in her conduct as a matron.

In 1809, Austria was induced once more to commence

war with France. Upwards of half a million of men were brought into the field, under the command of the Archduke Charles. Bonaparte, leaving Spain comparatively open to attack, moved rapidly forward into Germany, and, by the victory of Echmuhl, opened up the way to Vienna, which surrendered to him. After gaining a slight advantage at Essling, the archduke came to a second decisive encounter at Wagram, where the strength of Austria was completely broken to pieces. The peace which succeeded was sealed by the marriage of Napoleon to Maria Louisa, daughter of the Emperor of Austria, for which purpose he divorced his former wife Josephine.

In the autumn of 1809, the British government despatched an armament of 100,000 men, for the purpose of securing a station which should command the navigation of the Scheldt. The expedition was placed under the command of the Earl of Chatham, elder brother of Mr. Pitt, a nobleman totally unacquainted with military affairs on such a scale. The army, having disembarked on the insalubrious island of Walcheren, was swept off in thousands by disease. The survivors returned in December without having done any thing towards the object for which they set out. This tragical affair became the subject of inquiry in the House of Commons, which by a majority of 272 against 232, vindicated the manner in which the expedition had been managed.

SUCCESSES OF WELLINGTON IN SPAIN.

A new expedition in Spain was attended with better success. Taking advantage of the absence of Napoleon in Austria, a considerable army was landed, April 23, 1809, under the command of Sir Arthur Wellesley, who immediately drove Soult out of Portugal, and then made a rapid move upon Madrid. King Joseph advanced with a considerable force under the command of Marshal Victor; and, on the 28th of July, attacked the British and Spanish troops in a strong position at Talavera. The contest was obstinate and sanguinary; and though the French did not retreat, the advantage lay with the British. As this was almost the first success which Britain experienced by land in the course of the war, Sir Arthur Wellesley became the theme of universal praise, and he was elevated to a peerage, under the title of Viscount Wellington of Talavera. He was obliged immediately to fall back upon Portugal, where he occupied a strong position near Santarem.

Early in 1810, Napoleon reinforced the army in Spain, and gave orders to Massena to "drive the British out of the peninsula." Wellington posted his troops on the heights of Busaco—eighty thousand in number, including Portuguese—and there, on the 27th of September, was attacked by an equal number of French. Both British and Portuguese behaved well: the French were repulsed with great loss, and, for the first time in the war, conceived a respectful notion of the British troops. Wellington now retired to the lines of Torres Vedras, causing the whole country to be desolated as he went, for the purpose of embarrassing the French. When Massena observed the strength of the British position, he hesitated; and finally, in the spring of 1811, performed a disastrous and harassed retreat into Spain

It now became an object of importance with Wellington to obtain possession of the Spanish fortresses which had been seized by the French. On the 22d of April, he reconnoitered Badajos, and soon after laid siege to Almeida. Massena, advancing to raise the siege, was met on fair terms at Fuentes d'Onoro, May 5, and repulsed. Almeida consequently fell into the hands of the British. General Beresford, at the head of another body of British forces, gained the bloody battle of Albuera over Soult, and thereby protected the siege of Badajos, which, however, was soon after abandoned. During the same season, General Graham, in command of a third body of troops, gained the battle of Barossa. At the end of a campaign, in which the French were upon the whole unsuccessful, Wellington retired once more into Portugal.

SIR F. BURDETT.—THE REGENCY.

The exclusion of strangers from the House of Commons during the inquiries into the Walcheren expedition, had been made a subject of discussion in a debating club, the president of which was therefore committed to Newgate for a breach of privilege. Sir Francis Burdett, member for Westminster, made this proceeding the subject of some acrimonious remarks in a letter to his constituents, denying the right of the House of Commons to imprison without trial, and describing that body as "a part of our fellow-subjects, collected together by means which it is not necessary for me to describe." The letter was voted a libel on the house, and a warrant was issued by the speaker for committing Sir Francis to the Tower. Sir Francis, denying the legality of the warrant, resisted its execution by remaining in his own house, where he was protected from the officers by immense crowds of people. After suffering a kind of siege for two days, he was forcibly taken by a large train of soldiers, and lodged in the Tower. By these proceedings, the capital was convulsed for several days; and in the course of the tumults which took place, a number of lives were lost.

The intellect of the king, which had experienced several temporary aberrations, gave way at the close of the year 1810, and rendered the appointment of a regent unavoidable. Accordingly, in December, the Parliament imposed that duty upon the Prince of Wales, though under certain restrictions as to the appointment of officers and other branches of the royal prerogative. The Tory party had not now the same reason to dread the accession of the prince which they had in 1789. His sentiments on the Catholic claims, originally favourable, had in 1804 experienced a decided change, which proved the means of alienating him from the Whigs, with whom Catholic emancipation was a leading principle. Though he did not at first show any disinclination to take his old friends into the ministry, he contrived, when the first year of restriction had elapsed, to let them remain in their wonted state of opposition without seeming to have desired it.

EVENTS OF 1811, 1812, AND 1813.

The year 1811 was regarded as the period of greatest depression and distress which the British empire had known for several ages. At this time, with the exception of an uncertain footing gained in Spain, the influence of England was unknown on the continent. Bonaparte seemed as firmly seated on the throne of France as any of her former monarchs, while every other civilized European kingdom either owned a monarch of his express appointment, or was in some other way subservient to him. By the Berlin and Milan decrees, he had shut the ports of the continent against British goods, so that they could only be smuggled into the usual markets. By British orders in council, which, though intended to be retaliatory, only increased the evil, no vessel belonging to a neutral power—such, for instance, as the United States—was permitted to carry goods to those ports, unless they should previously land and pay a duty in Britain. Thus the nation at once suffered from the short-sighted despotism of the French emperor, and from its own narrow and imperfect views of commerce; for, by embarrassing America, it only deprived itself of one of its best and almost sole remaining customers.

The power of Bonaparte, though sudden in its rise, might have been permanent, if managed with discretion. It was used, however, in such a way as to produce a powerful reaction throughout Europe in favour of those

ancient institutions, which, twenty years before, had been threatened with ruin. The exclusion of British goods—a measure which he had dictated in resentment against England—proved the source of great distress, oppression, and hardship throughout the continent, and was greatly instrumental in exciting a spirit of hostility against him. The very circumstance of a foreign power domineering over their native princes, raised a feeling in favour of those personages, which being identified with the cause of national independence, acted as a very powerful stimulant. On the other hand, a sense of the grasping ambition of Napoleon—of his hostility to real freedom—of his unscrupulousness in throwing away the lives of his subjects for his own personal aggrandizement—had for some time been gaining ground in France itself.

In 1812, when the transactions in Spain had already somewhat impaired Napoleon's reputation, Alexander, Emperor of Russia, ventured upon a defiance of his decrees against British merchandise, and provoked him to a renewal of the war. With upwards of half a million of troops, appointed in the best manner, he set out for that remote country, determined to reduce it into perfect subjection. An unexpected accident defeated all his plans. The city of Moscow, after being possessed by the French troops in September, was destroyed by incendiaries, so that no shelter remained for them during the ensuing winter. Napoleon was obliged to retreat; but, overtaken by the direst inclemency of the season, his men perished by thousands in the snow. Of his splendid army, a mere skeleton regained central Europe. Returning almost alone to Paris, he contrived with great exertions to reinforce his army, though there was no replacing the veterans lost in Russia.

Early in 1813, he opened a campaign in northern Germany, where the Emperor of Russia, now joined by the King of Prussia, and various minor powers, appeared in the open field against him. After various successes on both sides, an armistice was agreed to on the 1st of June, and Bonaparte was offered peace on condition of restoring only that part of his dominions which he had acquired since 1805. Inspired with an overweening confidence in his resources and military genius, he refused these terms, and lost all. In August, when the armistice was at an end, his father-in-law, the Emperor of Austria, joined the allies, whose forces now numbered 500,000 men, while an army of 300,000 was the largest which Napoleon could at present bring into the field. Henceforth he might be considered as overpowered by numbers. By steady though cautious movements, the allies advanced to France, driving him reluctantly before them, and increasing their own force as the various states became emancipated by their presence. At the close of 1813, they rested upon the frontiers of France, while Lord Wellington, after two successful campaigns in Spain, had advanced in like manner to the Pyrenees.

HOME AFFAIRS.—WAR WITH AMERICA.

Some changes had in the mean time taken place in the British administration. On the 11th of May, 1812, the premier, Mr. Perceval, was shot in the lobby of the House of Commons, by a man named Bellingham, whom some private losses had rendered insane. Lords Liverpool and Castlereagh then became the ministerial leaders in the two Houses of Parliament, but were quickly voted down by a majority of four, upon a motion made by Mr. Stuart Wortley, afterwards Lord Wharncliffe. The ministry was finally rendered satisfactory to Parliament by the admission of Earl Harrowby as president of the council. Mr. Vansittart as chancellor of the exchequer, and Lord Sidmouth (formerly premier while Mr. Addington) as secretary for the home department; Lord Liverpool continuing as premier, and Lord Castlereagh as foreign and war secretary.

Notwithstanding the successes which were at this period brightening the prospects of Britain, the regent and his ministers did not enjoy much popularity. The regent himself did not possess those domestic virtues which are esteemed by the British people, and he had excited much disapprobation by the steps which he took for fixing a criminal charge upon his consort. The general discontents were increased by the effects of the orders in council, for prohibiting the commerce of neutral states. Vast multitudes of working people were thrown idle by the stagnation of manufactures, and manifested their feelings in commotion and riot. The middle classes expressed their dissatisfaction by clamours for Parliamentary reform.

At this unhappy crisis, provoked by the orders in council, as well as by a right assumed by British warvessels to search for and impress English sailors on board the commercial shipping of the United States, that country (June 1812) declared war against Britain. Before the news had reached London, the orders had been revoked by the influence of Lord Liverpool; but the Americans, nevertheless, were too much incensed to retrace their steps. During the summer and autumn, several encounters took place between single American and British ships, in which the former were successful. It was not till June 1, 1813, when the Shannon and Chesapeake met on equal terms, that the British experienced any naval triumph in this war with a kindred people. On land, the Americans endeavoured to annoy the British by assaults upon Canada, but met with no decisive success. The British landed several expeditions on the coast of the States; and were successful at Washington, at Alexandria, and at one or two other points, but experienced a bloody and disastrous repulse at New Orleans. The war ended, December, 1814, without settling any of the principles for which the Americans had taken up arms. But, while thus simply useless to America, it was seriously calamitous to Britain. The commerce with the States, which amounted in 1807 to twelve millions, was interrupted and nearly ruined by the orders in council, and the hostilities which they occasioned: and henceforth America endeavoured to render herself commercially independent of Britain, by the encouragement of native manufactures—a policy not immediately advantageous, perhaps, to herself, but decidedly injurious to Great Britain. The fatal effects of the Berlin and Milan decrees to Napoleon, and of the orders in council to the interests of Britain, show how extremely dangerous it is for any government to interfere violently with the large commercial systems upon which the immediate interests of their subjects depend.

PEACE OF 1814.—SUBSEQUENT EVENTS.

At the close of 1813, it was evident that Bonaparte could hardly defend himself against the vast armaments collected on all hands against him. Early in 1814, having impressed almost every youth capable of bearing arms, he opposed the allies on the frontiers with a force much less numerous and worse disciplined. Even now he was offered peace, on condition that he should only retain France as it existed before the Revolution. But this proposition was too humiliating to his spirit to be accepted; and he entertained a hope that, at the worst, his father-in-law, the Emperor of Austria, would not permit him to be dethroned. Two months were spent in almost incessant conflict with the advancing allies, who, on the 30th of March, entered Paris in triumph; and in the course of a few days, ratified a treaty with Napoleon, by which he agreed to resign the government of France, and live for the future as only sovereign of Elba, a small island in the Mediterranean.

In the measures for settling France, Great Britain concurred by her representative Lord Castlereagh, who attended the allies during the campaign of 1814; and

peace was proclaimed in London on the 20th of June. France was deprived of all the acquisitions gained both under the republic and the empire, and restored to the rule of the ancient royal family in the person of Louis XVIII. The Emperor of Russia and the King of Prussia visited England in June, and were received with all the honours due to men who were considered as the liberators of Europe. Wellington, now created a duke, received a grant of £400,000 from the House of Commons, in addition to one of £100,000 previously voted; and had the honour to receive in person the thanks of the house for his services. Representatives from the European powers concerned in the war met at Vienna, October 2, in order to settle the disturbed limits of the various countries, and provide against a renewal of a period of war so disastrous. Throughout the whole arrangements, Great Britain acted with a disinterested magnanimity, which, after her great sufferings and expenses, could hardly have been looked for, but was highly worthy of the eminent name which she bore amidst European nations.

In March, 1815, the proceedings of the congress were interrupted by intelligence that Napoleon had landed in France, and was advancing in triumph to the capital. He had been encouraged by various favourable circumstances to attempt the recovery of his throne; and so unpopular had the new government already become, that, though he landed with only a few men, he was everywhere received with affection, and on the 20th of March, was reinstated in his capital, which had that morning been left by Louis XVIII. The latter sovereign had granted a charter to his people, by which he and his successors were bound to rule under certain restrictions, and with a legislature composed of two chambers, somewhat resembling the British Houses of Parliament. Bonaparte now came under similar engagements, and even submitted to take the votes of the nation for his restoration, on which occasion he had a million and a half of affirmative, against less than half a million of negative voices, the voting being performed by ballot. His exertions to reorganize an army were successful to a degree which showed his extraordinary influence over the French nation. On the 1st of June, he had 559,000 effective men under arms, of whom 217,000 were ready to take the field.

A Prussian army of more than 100,000 men, under Blucher, and one of about 80,000 British, Germans, and Belgians, under Wellington, were quickly rendezvoused in the Netherlands, while still larger armies of Austrians and Russians, making the whole force above a million, were rapidly approaching. These professed to make war, not on France, but against Bonaparte alone, whom they denounced as having, by his breach of the treaty, "placed himself out of the pale of civil and social relations, and incurred the penalty of summary execution." Napoleon, knowing that his enemies would accumulate faster in proportion than his own troops, crossed the frontier on the 14th June, with 120,000 men, resolved to fight Blucher and Wellington separately, if possible. The rapidity of his movements prevented that concert between the Prussian and English generals which it was their interest to establish. On the 16th, he beat Blucher at Ligny, and compelled him to retire. He had, at the same time, intrusted to Marshal Ney the duty of cutting off all connection between the two hostile armies. His policy, though not fully acted up to by his marshals, were so far successful, that Blucher retired upon a point nearly a day's march from Wellington.

After some further fighting next day, Napoleon brought his whole force to bear, on the 18th, against Wellington alone, who had drawn up his troops across the road to Brussels, near a place called Waterloo. The battle consisted of a constant succession of attacks by the French upon the British lines. These assaults were attended with great bloodshed, but nevertheless resisted with the utmost fortitude, till the evening, when Blucher came up on the left flank of the British, and turned the scale against the French, who had now to operate laterally, as well as in front. The failure of a final charge by Napoleon's reserve to produce any impression on the two armies, decided the day against him: his baffled and broken host retired before a furious charge of Prussian cavalry, who cut them down unmercifully. On his return to Paris, Napoleon made an effort to restore the confidence of his chief counsellors, but in vain. After a fruitless abdication in favour of his son, he retired on board a small vessel at Rochfort, with the intention of proceeding to America; but being captured by a British ship of war, he was condemned by his triumphant enemies to a perpetual confinement on the island of St. Helena, in the Atlantic, where he died in 1821.

Louis XVIII. was now restored, and the arrangements of the Congress of Vienna were completed. The expenses of Great Britain during this last year of hostilities exceeded seventy millions; and the national debt, which in 1793 had been £230,000,000, now amounted to £860,000,000.

During the latter years of Napoleon, a reaction had taken place throughout Europe against the innovatory doctrines, which, by producing the French Revolution, had been the cause, innocent or guilty, of so much ruinous warfare. Encouraged by this sentiment, the sovereigns of Austria, Prussia, and Russia, had no sooner settled the new government of France, than they entered, September 26, 1815, into a personal league or bond for assisting each other on all occasions when any commotion should take place among their respective subjects. This treaty was composed in somewhat obscure terms, and from its professing religion to be the sole proper guide "in the councels of princes, in consolidating human institutions, and remedying their imperfections," it obtained the name of the Holy Alliance. It was published at the end of the year, and communicated to the Prince Regent of England, who approved of, but did not accede to it.

The reaction had also its effect in Great Britain, in fixing the power of the aristocracy, which, by composing the whole of the Upper House, and influencing the election of a major part of the Lower, might be said to constitute the government. The security of this predominating power was indicated by several acts in which their peculiar interests were consulted. In the preceding year, an act had been passed for prohibiting the importation of grain from the continent, when the price in this country should be less than eighty shillings per quarter. An attempt to continue the income and property taxes, which pressed with the greatest severity on the wealthy and landed classes, was also negatived.

THE PRINCESS CHARLOTTE.—POPULAR TUMULTS.

In May, 1816, the Princess Charlotte, only child of the Prince Regent, was married to Prince Leopold of Saxe-Coburg, a young officer who had gained her affections when attending the allied sovereigns at the British court. In November, 1817, to the inexpressible grief of the whole nation, the young princess died, immediately after having given birth to a dead son.

In August, 1816, a British armament under Lord Exmouth bombarded Algiers, and reduced that piratical state to certain desirable conditions respecting the treatment of Christian prisoners.

The year 1816, and the four following years, will always be memorable as an epoch of extraordinary distress, affecting almost every class of the community. The liberation of European commerce at the end of the war, produced a proportionate diminution of that trade which England had previously enjoyed through her exclusive possession of the seas. While all public bur

tene continued at their former nominal amount, the prices of every kind of produce, and of every kind of goods, had fallen far below the unnatural level to which a state of [illegible] and of paper money had raised them; and hence the expenses of the late contest, which had never been felt in the fictitious prosperity then prevalent, came to press with great severity upon the national resources, at a time when there was much less ability to bear the burden. To complete the misery of the country, the crop of 1816 fell far short of the usual quantity, and the price of bread was increased to an amount more than double what has since been the average rate.

Tumultuary proceedings took place in various parts of the country; and a desire for a reform in the House of Commons, which was supposed to be the only means of reducing the public expenditure, began to take deep root among the lower orders, and produced tumultuary excesses in the metropolis. The government then adopted expedients for counteracting the force of the popular spirit. They endeavoured to make it appear that an extensive conspiracy had been formed for the overthrow of the government. Of the four rioters charged with high treason, a conviction was obtained only against one. Such unanimity, however, prevailed between the ministry and the Parliament, that, at the close of February (1817), an act was passed for the suspension of the Habeas Corpus Act. Many persons were imprisoned and detained for some time at the will of the ministers.

A temporary revival of prosperity occurred in 1818, but was quickly followed by renewed distress. In the autumn of 1819, the misery of the working classes had reached its greatest height, and still parliamentary reform was demanded as the only measure which could permanently improve their prospects. On the 12th of July, at a public meeting in the unrepresented town of Birmingham, an attorney was elected to proceed to Westminster, and openly claim to be received as a member of Parliament. On the 16th of August, a vast body of operatives assembled at Manchester, in an open space of ground called St. Peter's Field, for a similar purpose, though professedly to petition for parliamentary reform. As they came in regular array, bearing banners with inscriptions, the magistrates professed to consider the meeting as dangerous to the public peace, and accordingly, ere the proceedings were far advanced, a body of troops, consisting chiefly of yeomanry, dashed into the mass, trampling down many persons of both sexes under the horses' feet, and killing and wounding others with their sabres. The meeting was dispersed by these means, and Messrs. Hunt and Johnston, the principal orators, were apprehended. The tragic nature of this event, and its appearing as an invasion of the popular right of meeting for redress of grievances, produced some marks of public resentment; but the magistrates who conducted the attack received the immediate and cordial thanks of the government.

When Parliament reassembled in November, there was an evident increase of attachment to the ministry; and in addition to the strong measures already taken for suppressing popular discontent, acts were passed to suppress unstamped political publications, to prevent secret training to arms, and to restrict the right of calling a public meeting to magistrates.

The year 1819 was remarkable, among other things, for the provision made, by act of Parliament, for the resumption of cash payments at the bank.

On the 20th of January, 1820, George III. died at Windsor, in his eighty-second year, without having experienced any lucid interval since 1810. The Prince Regent was immediately proclaimed as GEORGE IV.; but there was no other change to mark the commencement of a new reign. A few days after the decease of George III, the Duke of Kent, his fourth son, died suddenly, leaving an infant daughter, Victoria, with a very near prospect to the throne.

MISCELLANEOUS CIRCUMSTANCES FROM 1790 TO 1820.

Owing to the superiority of Britain at sea, she was able to preserve her commerce during the war, while that of France was comparatively ruined. This circumstance, combined with the remarkable effects of machinery in various manufactures, and the great improvements effected in agriculture, maintained the prosperity of the country during a contest which otherwise must have sunk her as low as it did Austria and Prussia. The value of the exports, which had been fifteen millions in 1760, and had only advanced to twenty in 1790, was, in 1802, *forty-six millions*.

This period is above all things memorable for the introduction of the use of steam in navigation. A model vessel, with a small steam-engine on board, was tried in 1788 by Mr. Patrick Miller of Dalswinton in Dumfriesshire. Soon after, a vessel on a larger scale was exhibited in perfect action on the Forth and Clyde Canal. The idea fell asleep for a few years, but was revived by Mr. Fulton, an American, who, in 1807, set agoing a steam-vessel on the Hudson river, the first in the world which was regularly employed in conveying passengers. In 1812, Mr. Henry Bell, of Helensburg, launched a similar vessel on the Clyde, being the first seen in Europe; and from that period steam-vessels quickly became numerous. Their superiority, in propelling vessels without regard to wind or tide, was in time universally acknowledged; and ultimately they have been used in voyages across large oceans.

In this period, considerable efforts were made for the more general education of the people. Sunday-schools, first suggested by Mr. Raikes of Gloucester, overspread the whole country, and proved the means of instructing many children who otherwise would have remained altogether ignorant. A plan of teaching great numbers of children, by employing the best pupils as monitors or assistants, was originated by Dr. Bell and Mr. Joseph Lancaster, and widely introduced. Two great societies were formed for the purpose of setting up and supporting schools in the districts where they were most needed. This period also beheld the rise of various societies, whose object it was to send missionaries to convert the heathen in distant lands, and to disseminate Bibles both at home and abroad. Great efforts were at the same time made in Britain to put an end to slavery in the West India colonies.

The latter part of the reign of George III. was also distinguished by great improvements in the dress and social condition of the people. Old fashions gradually disappeared, and the more simple and agreeable costume of the present day came into use. In the year 1750, cocked hats, wigs, swords, and buckles, were generally worn, and all gentlemen used hair powder. From the year 1790 to about 1800, these and many other oddities completely disappeared. Speedy travelling by stage-coaches, and the rapid transmission of letters by mail-carriages, became at the same time general in all parts of the United Kingdom.

At no period did a more brilliant class of literary men exist. Poetry assumed new and attractive forms in the works of Campbell, Moore, Southey, Wordsworth, Byron, and Scott. The novel or fictitious tale was advanced to a dignity it had never known before, in consequence of the production, by Sir Walter Scott, of a series of such compositions, in the highest degree dramatic and entertaining. In the Edinburgh and Quarterly Reviews, periodical criticism acquired an importance it never before possessed. At the same time, the more grave walks of divinity, history, and travels, were filled by a respectable body of writers. The name of Sir Humphry Davy stands pre-eminent in science, which has also cultivated

with distinguished success by Wollaston, Leslie, Playfair, and Robison. In philosophical literature, the names of Dugald Stewart and Thomas Brown ask for peculiar respect.

REIGN OF GEORGE IV.

At the time when George IV. commenced his reign, the Manchester affair and the recent proceedings of the ministry, had inspired a small band of desperate men with the design of assassinating the ministers at a cabinet dinner, and thereafter attempting to set themselves up as a provisional government. On the 23d of February, 1820, they were surprised by the police in their place of meeting, and, after a desperate resistance, five were seized, among whom one Thistlewood was the chief. These wretched men were tried for high treason, and executed. Nearly about the same time, an attempt was made by the workmen in the west of Scotland to bring about some alteration in the state; and two men were executed.

On the accession of the king, his consort's name had been omitted from the liturgy. This and other indignities induced her to return from a voluntary exile in Italy, June, 1820, to the great embarrassment of the king and his ministers. Her majesty, who had long been befriended by the Opposition, was received by the people with the warmest expressions of sympathy. Whatever had been blamable in her conduct was overlooked on account of the greater licentiousness of life ascribed to her husband, and the persecutions which she had suffered for twenty-four years. The king, who had established a system of observation round her majesty during her absence from the country, caused a bill of pains and penalties against her to be brought (July 6) into the House of Lords, which thus became a court for her trial. Messrs. Brougham and Denman, who afterwards attained high judicial stations, acted as counsel for her majesty, and displayed great dexterity and eloquence in her defence. The examination of witnesses occupied several weeks; and nothing was left undone which might promise to confirm her majesty's guilt. But no evidence of criminality could soften the indignation with which almost all classes of the community regarded this prosecution. Though the bill was read a second time by a majority of 28 in a house of 218, and a third time by 108 against 99, the government considered it expedient to abandon it, leaving the queen and her partisans triumphant.

In July, 1821, the coronation of George IV. took place under circumstances of great splendour. On this occasion, the queen made an attempt to enter Westminster Abbey, for the purpose of witnessing the ceremony, but was repelled by the military officers who guarded the door; an insult which gave such a shock to her health, as to cause her death in a few days. During the month of August, the king paid a visit to Ireland, where he was received with much cordiality by all classes of that excitable people, notwithstanding his known hostility to the Catholic claims. In September, he paid a visit to the kingdom of Hanover. In August of the ensuing year, he completed this series of visits by a voyage to Scotland, where, owing to the novelty of the occasion, and the historical associations which it was the means of awakening, he was also received with extreme kindness. During his absence in Scotland, his leading minister, the Marquis of Londonderry (formerly Lord Castlereagh) put an end to his own life, in consequence of a morbid sense of the difficulty of his position in regard to continental affairs. The successor of the Marquis of Londonderry in the direction of foreign affairs was Mr. George Canning, who had quitted the cabinet two years before on account of the prosecution of the queen, and was at this time preparing to leave the country as governor-general of India. Mr. Canning was a statesman of enlightened and humane spirit, and, among other popular qualities, possessed a rich and classical style of parliamentary eloquence.

JOINT-STOCK MANIA.—COMMERCIAL EMBARRASSMENTS.

The two ensuing years were characterized by an extraordinary activity in almost all departments of trade and commerce. Mr. Huskisson, an able commercial minister introduced by Mr. Canning, originated several measures highly important; especially the repeal of all duties on goods passing between Great Britain and Ireland—an alteration in the duties affecting the silk manufacture—the repeal of the combination laws, and of the law against the emigration of artisans; while the executive formed commercial treaties, on the reciprocity system, with various countries of Europe, and, acknowledging the independence of the revolted Spanish colonies in America, drew them as additional customers into the British market.

Capital now so far exceeded the ordinary means of its employment, that many joint-stock companies were formed, as a means of giving it a wider range than that to which it was usually limited. Some of these associations professed objects which were by long-established usage the proper business of individuals alone, and others involved hazardous and visionary projects, which were to be carried into effect in remote countries. The depressed state of trade in 1821 and 1822, had led to a diminished importation and production of goods, and been succeeded by an advance of prices in 1823. The consequence was a sudden and unusually active demand, and a powerful reaction of supply, which did not cease till production had far exceeded the bounds of moderation. Through the facilities afforded by large issues of paper-money, the delusion was kept up longer than it would otherwise have been. The first symptom of something being wrong, was the turning of the exchange against England. A diminution of issues at the bank followed. Merchants began to feel a difficulty in answering pecuniary obligations. Then took place a run upon the banks, some of which, both in London and in the country, were obliged to stop payment. Between October, 1825, and February, 1826, fifty-nine commissions of bankruptcy were issued against English country banks, and four times the number of private compositions were calculated to take place during the same period. While the merchant and manufacturer were without credit, their inferiors were without employment, and distress reached almost every class of the community. Some liberal pecuniary measures on the part of the Bank of England, helped, in a short time, rather by inspiring confidence than by actual disbursement of money, to retrieve, in some measure, the embarrassed circumstances of the country.

MR. CANNING'S ADMINISTRATION.—CATHOLIC EMANCIPATION.

In spring, 1827, the illness of Lord Liverpool (followed soon after by his death) opened the way for Mr. Canning's promotion to the first place in the administration; on which occasion, for various reasons of a personal as well as political character, the more uncompromising class of Tories resigned their places, leaving the reins of government in the hands of a comparatively popular party. Mr. Canning, however, sank under the new load imposed upon him, and died in the ensuing August. His friend Lord Goderich succeeded as premier; but resigned in January, 1828, when the Duke of Wellington was appointed in his place, with Mr. (afterwards Sir) Robert Peel as secretary for the home department.

From the year 1805, the Catholic claims had been a prominent subject of parliamentary discussion, and since 1821 they had been sanctioned by a majority in

the House of Commons. Almost despairing of their cause, while left to the progress of mere opinion in the English aristocracy, the Irish Catholics had in 1824 united themselves in an association with the scarcely concealed purpose of forcing their emancipation by means of a terrifying exhibition of their physical strength. An act was quickly passed for the suppression of this powerful body; but it immediately reappeared in a new shape. In fact, the impatience of the Catholic population of Ireland under the disabilities and degradation to which they were subjected on account of religion, was evidently becoming so very great that there could be little hope of either peace or public order in that country till their demands were conceded. Though the English public lent little weight to the agitation, and the king was decidedly hostile to its object, Catholic emancipation rapidly acquired importance with all classes, and in all parts of the empire. In spring, 1828, a kind of preparation was made for the concession, by the repeal of the test and corporation oaths, which had been imposed in the reign of Charles II.

The ministry soon after received an alarming proof of the growing force of the question. Mr. Vesey Fitzgerald had vacated his seat for the county of Clare, on becoming president of the board of trade. He was a friend to emancipation, and possessed great influence in the county; but he was also a member of an anti-Catholic administration. As an expedient for annoying the ministry, the Catholic Association, and all the local influences on that side, were set in motion to procure the return of Mr. Daniel O'Connell, the most distinguished orator of the Catholic party. To the surprise of the nation, Mr. O'Connell was returned by a great majority. It was even surmised that the laws for the exclusion of Catholics from Parliament would be unable to prevent him from taking his seat. The Duke of Wellington now began to see the necessity of taking steps towards a settlement of this agitating question; and the first, and most difficult, was to overcome the scruples of the sovereign. At the opening of the session of 1829, in consequence of a recommendation from the throne, bills were introduced by ministers for removing the civil disabilities of Catholics, and putting down the Catholic Association in Ireland; and, notwithstanding a great popular opposition, as well as the most powerful exertions of the older and more rigid class of Tories, this measure was carried by a majority of 353 against 180 in the House of Commons, and 217 to 112 in the House of Lords.

REIGN OF WILLIAM IV.

The agitations respecting the Catholic Relief Bill had in some measure subsided, when, June 26, 1830, George IV. died of ossification of the vital organs, and was succeeded by his next brother, the Duke of Clarence, under the title of WILLIAM IV. About a month after, a great sensation was produced in Britain by a revolution which took place in France, the main line of the Bourbon family being expelled, and the crown conferred upon Louis-Philippe, Duke of Orleans. By this event, a great impulse was given to the reforming spirit in Britain, and the demands for an improvement in the parliamentary representation became very strong. The consequence was the retirement of the Wellington administration in November, and the formation of a Whig cabinet, headed by Earl Grey. The agitations of the time were much increased by a system of nocturnal fire-raising, which spread through the south of England, and caused the destruction of a vast quantity of agricultural produce and machinery.

The Whig ministry came into power upon an understanding that they were to introduce bills for parliamentary reform, with reference to the three divisions of the United Kingdom. These, when presented in March, 1831, were found to propose very extensive changes, particularly the disfranchisement of boroughs of small population, for which the members were usually returned by private influence, and the extension of the right of voting in both boroughs and counties to the middle classes of society. The bills accordingly met with strong opposition from the Tory, now called the Conservative party. By a dissolution of Parliament, the ministry found such an accession of supporters as enabled them to carry the measure through the House of Commons with large majorities; but it encountered great difficulties in the House of Lords, and it was not till after a temporary resignation of the ministry, and some strong expressions of popular anxiety respecting reform, that the bills were allowed to become law.

During the few years which followed the passing of the Reform Bills, the attention of Parliament was chiefly occupied by a series of measures which a large portion of the public deemed necessary for improving the institutions of the country, and for other beneficial purposes. The most important of these, in a moral point of view, was the abolition of slavery in the colonies, the sum of twenty millions being paid to the owners of the negroes, as a compensation for resigning a right of property which had long been a disgrace to humanity. By this act, eight hundred thousand slaves were (August 1, 1834) placed in the condition of freemen, but subject to an apprenticeship to their masters for a few years.

In the same year, an act was passed for amending the laws for the support of the poor in England, which had long been a subject of general complaint. One of the chief provisions of the new enactment established a government commission for the superintendence of the local boards of management, which had latterly been ill-conducted, and were now proposed to be reformed. The able-bodied poor were also deprived of the right which had been conferred upon them at the end of the eighteenth century, to compel parishes to support them, either by employment at a certain rate, or pecuniary aid to the same amount: they were now left no resource, failing employment, but that of entering poor-houses, where they were separated from their families. The contemplated results of this measure, were a reduction of the enormous burden of the poor-rates which had latterly exceeded seven millions annually, and a check to the degradation which indiscriminate support was found to produce in the character of the labouring classes.

On the renewal of the charter of the East India Company in 1834, the government deprived it of its mercantile privileges, and extended the right of trading with China to the community at large. The ancient policy of not allowing Europeans to settle in Hindostan was also departed from, under some restrictions of inferior importance. Some reforms, equally advantageous to the public, were effected in the administration of the law and in the privileges held by the Bank of England.

In 1833, a reform took place in the mode of electing the councils and magistracies of the Scottish boroughs. Instead of regulations which took their rise in an early age, and had been found productive of mismanagement, the parliamentary constituencies were empowered, in all except a few cases, to choose the requisite number of councillors, to whom then belonged the duty of appointing the requisite number out of their own body to act as magistrates. In 1835, the English municipal corporations were reformed, upon a principle similar to that applied to Scotland, except that the rate-payers and freemen were designed to form the electoral bodies, and that the councils in most cases were to consist of a greater number of members. A modified reform of the same kind took place in Ireland, by virtue of an act passed in 1840.

During the summer of 1834, the ministry endeavoured

to carry through Parliament a bill to enable them to take unusual measures for restraining turbulence in Ireland. In consequence of a difficulty experienced in passing the measure, Lord Althorp and Earl Grey resigned their situations. The earl, who had now passed his seventieth year, was anxious for other reasons to retire from more active life, in order to spend the remainder of his days in the bosom of his family. He withdrew with the admiration of all parties, his whole career having been marked by consistency and sincerity. His place was supplied by Viscount Melbourne, and Lord Althorp was induced to resume office. The Irish Coercion Bill, with certain alterations, was then passed. On the 10th of October in this year, the two Houses of Parliament were burnt by accident.

In November, the death of Earl Spencer caused the advancement of his son Lord Althorp to the House of Peers, and the ministry was then left without a leader in the House of Commons. The king, who had for some time inclined to the Conservative party, took advantage of this circumstance to dissolve the cabinet. The Duke of Wellington was again called into office, and a messenger was despatched to Italy to bring Sir Robert Peel home from that country, in order to accept the premiership. Sir Robert hastened to London, and on the 10th of December, the new ministry was constructed, chiefly of the individuals who lost office in 1830. Sir Robert, though sensible of the difficulty of conducting public affairs at such a time, resolved to do the utmost to conciliate popular favour, by entering upon reforming measures. In a new House of Commons, his party was strengthened by nearly a hundred new votes; but he was still in a minority. After bringing forward a variety of measures of a reforming character, being defeated on the question of devoting some part of the Irish church revenues to education, he was compelled to resign (April 8, 1835), and allow the Melbourne ministry to be replaced.

In the session of 1836, the ministry were defeated, by majorities in the House of Lords, in attempts to carry several important measures of reform, but succeeded in passing an act for commuting tithes in England into a corn-rent charge payable in money; also in an act for enabling dissenters in England to be married otherwise than by the established clergy; and another for a general registry of births, deaths, and marriages. They likewise reduced the stamp-duty on newspapers to one penny, by which the circulation of that class of publications was very largely increased. From this time, there was a marked diminution in the zeal which had for some years been manifested for changes in the national institutions. Early in 1837, the ministry again introduced into the House of Commons a bill for settling the Irish tithe question; but before this or any other measure of importance had been carried, the king died of ossification of the vital organs (June 20), in the seventy-third year of his age, and seventh of his reign, being succeeded by his niece, the Princess Victoria, who had just completed her eighteenth year. The deceased monarch is allowed to have been a conscientious and amiable man, not remarkable for ability, but at the same time free from all gross faults.

COMMENCEMENT OF THE REIGN OF QUEEN VICTORIA.

The commencement of the reign of Queen Victoria has been marked by no signal events, and may as yet [February, 1841] be rather considered as a period of promise than of performance. Meanwhile, her majesty appears to have given unmixed satisfaction to her people by her marriage to Prince Albert of Saxe-Cobourg, and the birth of a princess-royal.

MISCELLANEOUS CIRCUMSTANCES FROM 1820 TO 1840.

This period is remarkable for the great efforts which were made to diffuse knowledge more generally among the people. *Mechanics' Institutions* were formed in most considerable towns, for the purpose of instructing that class of the community in mechanical and natural science. Various periodical works were also set a-going, for the purpose of communicating science and other branches of instruction, in such forms as to be intelligible to the less educated classes. At the same time considerable efforts were made to still farther extend education by means of ordinary schools. Among the individuals who sought to promote these objects, the most conspicuous was Lord Brougham, who filled the office of lord chancellor in the Grey administration.

In this period, the national energies were chiefly turned towards the arts of peace, and accordingly the prosperity of the country made, upon the whole, great advances. Though agricultural produce had ceased to bring the high prices it realized during the war, the farmers paid rents nearly equally high; and this they were enabled to do in consequence of the soil having been so much improved as to produce much larger crops. During this period steam navigation was immensely increased; ordinary roads were greatly improved by the mode of paving invented by Mr. Macadam; and railways began to overspread all parts of the country, for the conveyance of goods and passengers by means of steam locomotive carriages, the common speed of which is about thirty miles an hour. These circumstances form the fair side of the picture; on the other, we behold discontents pervading large sections of the working population, on account of the low wages of labour, and other real or imaginary grievances.

CONSTITUTION AND RESOURCES OF THE BRITISH EMPIRE.

The British Empire consists of the United Kingdom of Great Britain and Ireland (including a number of minor islands around their shores), and colonies and other dependencies in different quarters of the world. The most remarkable peculiarity in the political condition of the British empire, is the high degree of civil and religious liberty which all classes of subjects practically enjoy. Slavery exists in no quarter of the British dominions: personal freedom, with liberty to come and go, unquestioned and unimpeded, is assured to all, without respect of birth, rank, language, colour, or religion.

Britain, while in population and some other respects surpassed by several other nations, possesses a degree of wealth and political influence which may be said to place her at the head of all nations. This unprecedented [illegible] and power appears to have taken its rise in a fortunate concurrence of favouring circumstances, some of a physical and others of a moral character.

The first of the physical causes in importance is unquestionably the insular situation, at once protecting the country from the destructive invasions which have so much depressed and retarded many continental states, and furnishing opportunities for a ready commerce with all the shores of the civilized world. The second of these causes is to be found in the natural fertility of a large portion of the United Kingdom, and the temperate climate enjoyed by it, favouring the production of the food necessary for a large population. A third cause is the large amount of the mineral wealth of England, furnishing her with the means of prosecuting manufactures to an extent beyond all which the world has ever before had experience of. Thus Britain has been naturally qualified to become the seat of a great agricultural, manufacturing, and commercial nation, and must always, from the nature of things, have tended to assume that character. Moral causes, it is true, might have been unfavourable. Had a branch of the Ethiopian or Mongolian races possessed the country, its natural advantages would probably have remained unused. But the stock of the British population chances to have sprung from the Teutonic branch of the Caucasian variety, a race who have in many countries proved the superiority of their intellectual and moral organization. The idea of trial by jury, and of arranging public affairs by a representative body, hit upon at an early period by this race, show that it possesses a natural aptitude for forming improved political institutions. Its concern in the most important modern inventions shows its ingenuity in the arts. Its maritime enterprise and mercantile intrepidity were testified at a time when other nations were engaged only in feudal broils. Planted in England in the fifth century, and probably in Scotland many centuries before, we see this people making a continual advance ever since in political institutions and in the arts of peace. Historians point out the accidents which effected conspicuous changes; but, while the feebleness and wickedness of a John may have been the immediate cause of the Magna Charta, and the passion of Henry VIII. for a beautiful woman the proximate cause of the reformation of religion, there must have also been something in the people pressing them irresistibly towards liberty of person and of conscience, and enabling them to overcome all obstacles to the accomplishment of those objects. It was in the nature of the people to establish free institutions—and they were established. A people so active and so ingenious could not fail to take advantage of the natural facilities which they enjoyed for manufactures and commerce. They made the best of blades in the days of Cœur de Lion, and in the time of Elizabeth their sails whitened every neighbouring sea. Arts, driven out of other countries by ruthless bigotry, found refuge and flourished among a people who eagerly grasp at every kind of employment which promises to be useful. It is to their persevering industry, exercised by favour of so many natural circumstances, and constantly protected by free institutions, that we are mainly and most immediately to look for the source of the greatness of the British empire.

FORM OF THE BRITISH GOVERNMENT.

The government of the United Kingdom is constitutional, or possesses a regular form, in which the civil rights of all classes are acknowledged and guaranteed. The constitution is a monarchy, in which the sovereign accepts of his dignity under an express agreement to abide by certain prescribed forms of government according to the laws of the realm, and to maintain inviolate the Protestant religion, with all the rights and privileges of the church. The sovereign is the head or directing power in the executive of government, the fountain of all honours, and the watchful guardian of the interests of the state: he is held to be incapable of doing wrong; and if an unlawful act is done, the minister instrumental in that act is alone obnoxious to punishment. The legislative part of the government is composed of two deliberating bodies—the House of Lords and the House of Commons—both of which consist of individuals belonging to the United Kingdom only, the colonial dependencies of the empire having no share in the general management.

House of Lords.—The persons who compose the House of Lords form a separate class or rank, which is called collectively the Peerage, whose members enjoy certain exclusive privileges and honours. The members of the House of Lords are either lords spiritual or temporal. The spiritual lords are archbishops and bishops, and hold their seats for life in virtue of their ecclesiastical office; the temporal lords enjoy their seats from hereditary right, or in virtue of being elevated to the peerage. In 1837, at the meeting of the first Parliament of Queen Victoria, the number of members of the House of Lords was 641; namely, 3 princes of the blood royal, 2 English archbishops, 21 dukes, 19 marquises, 112 earls, 19 viscounts, 24 English bishops, 6 Irish prelates, 193 barons, 16 representative peers of Scotland, and 28 representative peers of Ireland. The House of Lords is liable at all times to an increase of number by the elevation of commoners to the peerage; but this prerogative of the crown is sparingly used.

The House of Commons.—This body consists of 658 members; of whom 253 are chosen by counties, 6 by universities, and 399 by cities, boroughs, and towns. England returns 471, Wales 29, Ireland 105, and Scotland 53. The number of persons entitled to vote in the election of these members is probably about a million; of whom about 600,000 vote for county members, 5000 for representatives of universities, and 400,000 for members for cities, boroughs, and towns. The great bulk of the voters, as settled by the Reform Acts of 1832, is

composed of the agricultural tenantry and the occupants of houses of £10 of yearly rent; in other words, the middle classes. The operative classes, from their not in general inhabiting houses of such value, possess little direct influence in the election of members of the House of Commons. A House of Commons cannot legally exist for more than seven years; but, in reality, it rarely exists so long, the death of the sovereign, change of ministry, and other circumstances, causing a renewal on an average every three or four years. Reckoning from 1802 till November 15, 1837, there were thirteen Houses of Commons; as the thirteenth still exists (January, 1841), we have an average of three years for each; those of longest duration were the fourth, from 1807 to 1812, and the fifth, from 1812 to 1818.

The Houses of Lords and Commons compose the *Parliament*. The Parliaments of England and Scotland were united in 1707, and then called the British Parliament. In 1800, the Irish Parliament merged in the British Parliament. The three kingdoms were first represented in one Parliament in 1801. Since that period it has been called the *Imperial Parliament*, and is always convened at Westminster.

The two houses, with the sovereign, compose the three estates of the realm, or legislative body. The sovereign takes no personal concern in the proceedings of Parliament, further than opening or proroguing the sessions; but the interests of the crown in Parliament are intrusted to members of the cabinet council or ministry, and by them are defended and explained. The two houses, with the sovereign, have the power to pass laws, impose taxes, borrow money, make inquiries into the management of the public revenues, or the transactions of the great officers of government, and even to bring the latter to trial, if necessary. Members of either house inquire into the manner in which all great public institutions or boards of management are conducted, such as those for education, for purposes of charity, for the erection of lighthouses on the coast, for the construction of harbours, and generally, indeed, into all the business which is intrusted to the executive part of the government; they cannot direct what is to be done, but may always make scrutiny into it afterwards, if any error or mismanagement has taken place. The discussions on these subjects are often very warm and eager, and bring to light facts of great public importance. No act of the two deliberative bodies becomes valid as a law, without the assent of the sovereign; and all propositions relating to money to be raised for the public service, must originate with the House of Commons, the Lords merely giving their assent as a matter of form, without being allowed to alter any thing. This circumstance gives a much larger share of influence to the Commons than is possessed by the Lords; the former having it in their power, whenever they are dissatisfied with the measures of government, to stop the supplies of money, and bring the whole machinery to a stand.

Each of the two houses has one presiding member, whose duty it is to preserve order and see that the regulations of the assembly are attended to by the members; he is also the person through whom any communication passes between the house and the queen, he alone having the privilege of addressing her majesty in name of the house. Hence, in the House of Commons, this officer is called the *Speaker*; in the House of Lords he is commonly known as the *Lord Chancellor*, from another office which he holds; but the duties of the latter are quite the same as those of the Speaker of the Commons. There are numerous forms established for the regularity of business in Parliament, but of these there are only a few which need be mentioned here. Any proposal which is laid before either of the houses, in order to pass into a law, must be made out by its promoter *in the form* of an act of Parliament, but is only known by the name of a *bill* while under discussion; permission must first be obtained to introduce the bill, and it must then be read and considered by the house three several times, besides being once scrutinized more closely by a committee or select number of the members, and, if a public bill, by the whole house sitting as a committee, when each member is permitted to speak as frequently as he sees occasion, whereas in the regular sittings of the house no one is allowed to speak more than once, except to explain where his first statements have been misunderstood. If it is not rejected in any of these three readings, or given up in the committee, the bill is said to have passed. It must then go through the same process in the other house, where it is sometimes adopted, sometimes rejected; but if any alterations are made on it here, they must be reported to the house where it first originated. If the two cannot agree on the changes proposed, the bill falls to the ground; but some modification is generally contrived which satisfies both parties. It still remains to obtain the sanction of the sovereign, which is hardly ever refused, when the *bill* becomes an *act of Parliament* or *law*.

The members of both houses have certain personal privileges, which are deemed necessary for enabling them properly to attend to their public duties. In Parliament, they enjoy absolute freedom of speech, and cannot be questioned out of the house for any thing said in the debates; they and their servants are exempted from arrest (except in criminal cases) during their attendance in Parliament.

The Executive, as already stated, is reposed in the hands of a sovereign. The dignity of the sovereign is hereditary in the family of Brunswick, now on the throne, and in the person of either a male or female. A queen reigning, therefore, enjoys the same privileges as a king. Besides enforcing the laws of the realm, through the medium of courts of justice, and a variety of functionaries, the sovereign is charged with the office of levying taxes granted for the public service, and of defending the empire at home or abroad against foreign enemies. He, or she (with reference to our present sovereign), also conducts all intercourse with the rulers of other nations, forming treaties and alliances, declaring war or concluding peace. She has the duty of protecting the persons and trade of British subjects in foreign countries. For this purpose, she has the sole appointment of the officers who perform these duties; of judges in the several courts of law; of officers in the army and navy; of public ambassadors, and of consuls at foreign ports for the safety of trade; and of the officers who levy the taxes. She has also large forces, both naval and military, at her disposal, which are stationed in different parts of the empire where she or her advisers think that they are wanted for the time. The task of managing all these extensive concerns, which would fall into confusion in the hands of one person, is deputed by the queen to a number of persons, who are denominated her *Ministers*, and sometimes the *Cabinet*. These are nominally selected and appointed by the queen herself; but as her choice would be in vain if it were to fall on men who were disagreeable to Parliament (which might in that case refuse to grant supplies for national business), the ministry is generally chosen from among such men as enjoy a considerable share of public confidence. They have all some high state office. The chief is the *First Lord of the Treasury*, whose nominal duty is the receiving and issuing of the public money, while his actual station is that of leader of the administration; he is the first who is appointed in any ministry, and generally selects all the other members, according to his own views of their abilities, or of the influence they possess in the country or in Parliament; and any changes afterwards made are generally at his suggestion, or at least with his full assent. Next is the *Lord High Chancellor*, who

presides in the highest law court of the kingdom, and is Speaker of the House of Lords; he is chief adviser of the sovereign in all that relates to the laws of the country, and has the disposal of a great number of clerical and law offices. After him are the principal secretaries of state, who are five in number, each having a separate charge; the first is Secretary for the Home Department, after whom are the Secretaries for Foreign Affairs and for the Colonies, the Secretary at War, and the Secretary for Ireland. These, with the *Chancellor of the Exchequer*, and several others of the high officers of state, form what is called the *Ministry*, the *Cabinet Council*, or briefly the *Cabinet;* and all the measures of the executive government are settled by their deliberations.

The regular division of labour which is established in the British government, is one of its chief excellences; because every secretary, or other officer of state, having a particular department assigned to him, the responsibility for any error or mismanagement is established at once, and may be either rectified or punished. Parliament itself has its duties; and when these are not performed to the satisfaction of the electors, the members can be dismissed at next election, to make way for others who deserve better.

The British constitution, thus slightly sketched, may be generally described as an anomaly in political science, being both professedly and in reality a mixture of all the three kinds of government—monarchical, aristocratical, and democratical. Such a government would probably be found totally inapplicable in other societies; but in Britain it answers well, having grown up in conformity with the views and character of the people, and enjoying, in consequence of that conformity and of its long existence, the respect required to enable any system to work. Upon the whole, notwithstanding the Reform Acts, the aristocratic principle predominates, yet fully as much from the spirit of the people themselves, as from any forms of the constitution. An unprejudiced foreigner would probably remark, that the greatest drawback from its happy working now is, the position in which it places the labouring portion of the community.

FINANCES.

Revenue.—The revenue of the British empire has varied exceedingly of late years; from 1761 to 1774, which was a period of peace, it increased from £8,800,000 to £10,285,673; and since that time, from the various wars in which the country was engaged, the immediate expenses, and the interest of public debts, it has continued to augment till within these last ten or twelve years. From 1775 to 1783, which was the period of the American war, it rose from ten millions to twelve millions; and during the peace which followed till 1793, it was increased to seventeen and a half millions a year.

After this period the French revolutionary war commenced. That war was by no means unpopular with the nation; and it was besides gilded by the many splendid victories which continued to be obtained by British seamen as long as the enemy had a fleet to appear at sea. Heavy taxes for defraying the expenses of this war were therefore submitted to without remonstrance, and the public revenue rose accordingly to a very large amount. From 1794 to the peace of Amiens in 1801, which only lasted two years, the revenue was increased from seventeen and a half millions to twenty-eight millions: and from 1803 till 1816, the year after the final conclusion of peace, it had risen to £76,834,494, which was the largest sum raised by taxes in one year.

The sums thus raised in taxes, large as they were, did not, however, meet the expenditure of the country during these periods of war. In order to defray the great charges which arose, it became necessary also to borrow to a great amount. The following table will show the sums raised by the taxes, the sums borrowed, and the total expenditure for each of the years specified.

Year.	Raised in Taxes.	Borrowed.	Total Expenditure.
1794	£17,674,395	£5,079,971	£22,751,366
1801	28,085,829	33,532,159	61,617,988
1803	38,401,738	23,972,742	62,373,480
1806	53,698,124	22,358,672	76,056,796
1810	66,029,319	22,763,202	88,792,551
1814	70,926,215	52,309,445	122,235,660
1816	76,834,494	54,471,464	130,305,958

These sums will appear altogether enormous, and must give the most extraordinary idea of the resources of a government, which, while it raised such a large yearly amount in taxes, had yet credit to borrow the immense additional sums which were wanted. The whole sum which was expended in the wars of the revolution, from 1794 to 1816, amounted to 1700 millions of pounds sterling—a sum so far beyond all ordinary dealings, that we can have little conception of its amount or value. All the mines that are at present wrought in Europe and America would not furnish gold and silver equal to it in less than 310 years.

The debt formed by borrowing money at different rates of interest to conduct the warlike operations of the country, has risen from small beginnings towards the conclusion of the seventeenth century, to an unparalleled amount. At the revolution of 1688, the national debt amounted to only £664,263; at the accession of Queen Anne, £16,394,702; of George I., £54,145,363; of George II., £52,092,235; at the end of the Spanish war in 1748, £78,293,312; at the commencement of war in 1755, £74,571,840; at the conclusion of peace in 1762, £146,682,844; at commencement of American war in 1776, £135,943,051; at conclusion of peace in 1783, £238,484,870; at commencement of French revolutionary war, £233,733,609; at peace of Amiens in 1801 £582,839,277; at peace of (Feb. 1) 1816, £864,822,461; on the 5th of January, 1832, £782,667,224—interest, £28,341,416. Since 1832, the debt has increased, chiefly by the funding of exchequer bills (adding floating obligations to funded stock), and in 1839, the amount was £841,000,000, with an interest of £29,000,000.

The revenue which it is necessary to raise for the purpose of paying the interest of the debt, and conducting the business of the country, is derived from taxation upon a great variety of different articles, which are all, however, reduced to the following heads:

1. *The Customs.*—These are taxes levied upon the foreign commerce of the country, being the duties paid upon articles imported from abroad, such as tea, sugar, coffee, spirits, wines, tobacco, &c. They include also a few on some goods exported, such as coals, wool, and skins. Their whole amount, in the year ending October 10, 1840, was £20,152,739.

2. *The Excise.*—The excise taxes are those which are levied on goods of British manufacture, such as glass, malt, paper, &c. The duty is paid back again to the maker, if the commodity is to be exported to foreign countries. This class of taxes yielded, in the above year, £11,985,467.

3. *Stamp Duties.*—These consist of the prices affixed to stamp papers, upon which the law makes it imperative that every document for the transfer of property, or other obligation, shall be written. Deeds, settlements, and bills, bills of exchange, receipts (above a certain small amount), and a great variety of other instruments of business, are required to be stamped in this manner; and the prices affixed to the stamps, which are often high, bring a large revenue. Under the head of stamps, are also included newspaper stamps, indentures, dice, duties on plate, and other anomalous items. The whole amounted in the above year to £6,726,31[illegible]

4. *Direct Taxes.*—These are duties levied on land, on windows (eight or upwards), male servants, riding horses, dogs, use of armorial bearings, hair powder, &c. This class of taxes, which are levied by surveyors and collectors, amounted in the above year to £3,744,372. The principal items are the land and window taxes, each of which was above a million.

5. *Post-Office.*—In the year ending October, 1839, the revenue derived from the tax on letters passing through the post-office was £2,390,764. But, by the reduction of postage to one penny per letter (if under half an ounce) at the beginning of 1840, the amount of revenue derived from this source in the year ending January, 1840, was only £441,000. The great advantage derived by the country from cheap postage more than compensates the deficiency.

6. The income derived from rentals of *crown property*, and the sale of timber, bark, &c., from the crown lands (with other incidents), yielded a revenue, in the year ending October, 1840, of £167,500.

7. *Miscellaneous.*—These include duties on hackney-coaches, hawkers' licenses, offices, pensions, &c.; and amounted to £84,479.

8. Some *incidental revenues* are derived from matters connected with the regular taxes; such as duties collected at the Isle of Man, fines, and goods seized for taxes; these, with a number of other casual receipts, amounted, in the above year, to £454,784. Besides this, there was a sum entitled *Repayments of Advances*, amounting to £656,140.

The total of the income for the year ending October, 1840, was £44,665,798; and it will be observed that of that sum fully thirty-two millions were raised from customs and excise, or duties on foreign and British manufactures, and nearly seven millions on stamps. Thus, the great bulk of taxation is indirect, and the really direct taxes are a mere trifle in comparison. The chief burden of the taxes evidently falls on the consumers of tea, coffee, sugar, tobacco, soap, spirits, and wines, and these consumers are the great body of the people. As the land-tax amounts to no more than £1,300,000 annually, proprietors of lands contribute but a small direct aid to the public income. The customs duties are levied on nearly 1700 articles imported into the country, but a few leading articles raise nineteen-twentieths of the entire amount, and the insignificant sum raised from the remainder acts merely as a prohibition on foreign commerce. The following were the duties levied on ten articles in the year ending January 5, 1840:—

1. Sugars and molasses,	£4,826,917
2. Tea,	3,658,763
3. Spirits,	2,615,413
4. Wine,	1,849,308
5. Tobacco,	3,495,686
6. Coffee and cocoa,	794,818
7. Fruits of all kinds,	462,002
8. Timber and dye-woods,	1,668,584
9. Corn, grain, meal, and rice,	1,131,075
10. Provisions (including bacon, hams, butter, eggs, &c.),	368,560
Total amount,	£20,871,126

On the following six articles, the duties levied in the year ending January 5, 1840, were as follows:—

1. Seeds of all kinds,	£145,712
2. Oils of all kinds,	69,964
3. Spices of all kinds,	98,261
4. Hides and skins,	94,987
5. Tallow,	181,999
6. Wool (cotton and sheep's),	556,225
	£1,147,148
Which added to the duties levied on the ten articles in the preceding list, namely,	20,871,126
Gives a grand total on sixteen unmanufactured articles of	£22,018,274
Balance received on 1136 minor articles,	944,326
Total net revenue,	£22,962,600

Therefore the duty levied on all the remaining 514 articles, including all raw materials and manufactured goods, is £55,674 less than one million. The revenue levied on manufactured articles was as follows:—

	Duty.	
Brass manufactures,	30 per cent.	£1,710
Boxes of all kinds,	20 ...	2,769
Bugles,	1s. per lb.	2,140
Earthenware, china, &c.,	15 to 20 per cent.	5,622
Clocks and watches,	25 ...	9,628
Copper, manufactures of	30 ...	731
Cotton, manufactures of 10, and made up	20 ...	6,584
Embroidery and needlework,	30 ...	8,875
Flowers, artificial (not of silk),	25 ...	5,299
Glass bottles, and all other sorts of glass,	30 to 120 ...	27,304
Hair and goat's wool, manufactures of	30 ...	3,097
Hats of chip and straw	20s. per dozen	1,729
Leather gloves,	20 to 40 per cent.	18,506
Manufactures of leather, including shoes and boots,	30 ...	6,095
Paper and paper-hangings, 3d. per lb., and 1s. per square yard, and hangings,		1,579
Plaiting of chip and straw, 17s. to 20s. the lb.		19,637
Silk manufactures, various duties,	20 to 40 per cent.	247,361
Toys,	20 ...	3,793
Cologne water, 1s. per flask, or 30s. the gallon,		5,009
Woollen manufactures, 15 per cent. and made up 20 per cent.		25,111
Total duty levied,		£402,576
On manufactures, except so much as is included in the £80,760 received from the remaining enumerated tariff and non-enumerated articles; say one-half on manufactures,		40,380
Total on manufactures,		£412,956
Duty levied on raw materials, exclusive of cotton and wool, dye-woods, oils, tallow, seeds, hides, and skins,		500,271
Total duties levied on manufactures and minor raw materials,		£913,227

The whole question of import duties, with reference to an improvement in the mode of levying them, has lately been considered by a committee of the House of Commons; and it is likely that a very great alteration will speedily be adopted, for it appears that the prohibitive duties act injuriously on British manufactures, and induce foreigners, by way of retaliation, to exclude our goods from their markets.

Expenditure.—The total annual revenue, as above mentioned, is at present between forty-four and forty-five millions, and we have now to see how this large sum is spent. The first great item in the expenditure is in the form of interest on the national debt: in the account rendered of the expenditure during the year ending October, 1840, the following statements are made:—Amount applied to consolidated fund, £31,836,088; amount applied as advances, and to pay off exchequer bills issued as advances, £559,592; amount paid as part of ways and means of year, £12,270,118. It is difficult to obtain an exact idea of this complicated statement; but we may be certain of the general fact, that about £31,000,000 are paid annually as interest of debts due, or partial liquidation of debts, and that the whole business of the con-

uy—civil, military, and naval, including charges for royal household—is conducted for the sum of £13,000,000. The debt has been latterly increasing; in other words, the revenue is falling short of the expenditure.

Miscellaneous.—Every year, there are various charges under the head of *miscellaneous*, which consist of payments made by grants of Parliament for a great number of purposes. The following are these payments for 1836:

Public buildings, including National Gallery and temporary houses of Parliament,	£149,035
Roads, canals, harbours, lighthouses, and surveys,	144,355
Expenses attending the two houses of Parliament,	57,418
Salaries in public departments not otherwise defrayed by fees or by deductions from the revenue in its progress to the exchequer,	193,570
Superannuation allowances in public departments,	49,692
Contingent expenses in public departments,	55,234
Parliamentary and other commissions, revising barristers, and the like expenses,	262,811
Civil and ecclesiastical establishments in colonies,	95,902
Special justices in West India colonies,	49,469
Establishing steam-navigation to India,	5,726
Indian department in Canada, instruction of emancipated negroes, and support of captured negroes,	64,112
Expense of convicts, police, and criminal prosecutions,	282,069
Consular services,	83,229
Scientific and literary objects,	47,267
Charitable institutions and objects,	68,950
Educational purposes,	71,546
Printing and stationery,	176,665
Law charges,	24,000
Civil contingencies, miscellaneous services—Scotland,	120,175
Claims of merchants arising out of war with Denmark,	96,442
Secret services,	29,650
Loss sustained by re-coinage of silver and gold,	46,889
Compensation to individuals,	6,641
Charges formerly paid out of county rates,	69,000
Nonconforming ministers,	29,463
	£2,279,310

Civil List.—The expense incurred for the personal support of the sovereign and royal family and household, is but a small item in the general expenditure of the nation. Formerly, the crown possessed private revenues from lands, duties, &c., but all such are now abandoned to the country (chiefly under management of the Board of Woods and Forests), and the sovereign in requital is voted a civil list, or certain fixed sums, by Parliament. On the accession of William IV., the civil list was voted under five different classes, amounting in the aggregate to £510,000 per annum, as follows:—

Class 1. For the king's privy purse, £60,000; for the queen, £50,000,	£110,000
" 2. Salaries of the royal household,	130,300
" 3. Expenses of the household,	171,500
" 4. Special and home secret services,	23,200
" 5. Pensions,	75,000
	£510,000

On the accession of Queen Victoria, a civil list in six classes was voted, amounting in the aggregate to £385,000, with a power to the crown to grant pensions to an amount not exceeding £1200 in any one year.

Salaries in Civil Departments.—The number of persons employed in the various civil departments of government was reduced to 3787, causing a saving of £976,822, between 1815 and 1835. In 1835, the following statement was given of the number of persons employed in the chief departments of government, with amount of salaries

DEPARTMENTS.	No. of Persons.	Amount of Salaries.
Treasury, including Commissariat and Solicitor,	92	£56,346
Exchequer Offices,	14	7,005
Paymaster of Civil Services,	20	7,529
Privy Council Office,	18	9,058
" " " for Trade,	29	11 331
Secretary of State—		
" Home Department,	30	19,678
" Foreign,	39	21,584
" Colonial,	31	20,487
India Board,	38	21,300
Privy Seal Office,	1	2,000
Alien Office,	7	1,161
Register of Colonial Slaves' Office,	4	1,21[illegible]
State-Paper Office,	6	1,573
Commander-in-Chief's Office,	21	7,167
Adjutant-General's Office,	22	3,870
Quartermaster-General's Office,	19	2,210
War Office, including Office for Military Boards,	64	32,042
Judge-Advocate-General's Office,	7	3,460
Army Medical Board Office,	5	2,850
Chaplain-General's Office,	2	276
Army Pay Office,	51	17,614
Ordnance Department,	996	159,128
Chelsea Hospital, including Secretary's Agents and Treasurer's Office,	157	23,999
Royal Military College,	80	...
Royal Military Asylum,	67	3,699
Admiralty and Naval Departments,	821	227,971
Customs Department, including Coast Guard,	11,602	940,762
Excise Department,	6,072	722,456
Stamps and Taxes ditto,	660	106,347
Post-Office,	1,774	124,439
Mint Office,	30	10,110
Audit Office, and other Offices transferred to that Department,	130	39,050
National Debt Office,	31	8,717
Exchequer Bill Office,	11	3,610
Woods, Forests, Land-Revenue, and Public Works Office,	60	18,445
Stationery Office,	34	5,076
Alienation Office,	7	806
Lottery Office,	...	...
Exchequer and other Departments in Scotland,	296	94,782
IRELAND.		
Chief Secretary's Office,	38	14,536
Chief Secretary's office in London,	8	2,410
Privy Council Office,	7	2,575
Vice-Treasurer's Office, late Irish Treasury, &c.,	13	4,964
Tellers' Office, Exchequer,	5	1,680
Privy-Seal Office,	2	100
Office of Public Works,	19	5,096
Office of Lieutenant-General Commanding,	6	1,066
Army Medical Office,	3	1,044
Quartermaster-General's Office,	6	664
Deputy Judge-Advocate-General's Office,	1	597
Provost Marshal-General's Office,	1	168
Adjutant-General's Office,	9	1,018
Commissariat Department,	12	2,246
Royal Hospital, Kilmainham,	54	3,138
Board of Charitable Donations,	1	184
Board of Education,	25	4,756
	23,578	£2,786,278

The expenses incurred for the colonies were lately £2,606,483 per annum, but this included the outlay in the military and naval departments; and the annual expenses for ambassadors and consuls in foreign countries was £264,616, and for courts of justice nearly £800,000. Altogether, the *civil* management of the United Kingdom costs about £4,000,000, or but a tenth of the entire expenditure.

THE ARMY AND NAVY.

The Army.—According to the terms of the constitution, a permanent or standing army is not held to be legal. It is understood that the civil power, as exerted by magistrates, constables, and police, is competent to preserve order, and that the creation of a military force is only a matter of temporary necessity. An army, however, being constantly required both to assist the civil authority, and to protect the foreign possessions of the empire, an act of parliament, called the Mutiny Act, is passed annually, to maintain a large body of troops in regular service. Whether from this provision in the constitution or otherwise, it happens that education in military tactics is conducted on a very limited scale; the privates in the army are enlisted by small bounties from the lowest classes of the community, and very rarely, if ever, are promoted to the rank of commissioned officers. The commissioned officers, in general, belong to the aristocracy or landed gentry, and in most instances purchase their commission according to a scale of prices. Although both privates and officers are alike ill-prepared, by previous instruction, for performing the duties of their profession, such are the effects of discipline, the excellence of equipment, and other advantages, but, above all, a high tone of honour and spirit of valour, that the British army is found able to compete with forces recruited under far more favourable circumstances.

The army at present (1841) consists of the following numbers and descriptions of force:—

	Horses.	Men.	Officers and non-commissioned officers.	Expense, pay, clothing, &c.
Cavalry.				
Guards, 3 regts.	922	1,053	258	£87,102
Line, 23 regts.	7,696	8,578	1,578	466,372
Infantry.				
Guards, 3 regts.	..	4,640	613	192,079
Line, 99 regts.	200	81,407	10,948	2,781,365
	8,718	95,678	13,397	£3,526,918

To the account of expense mentioned above, there is to be added £466,237 for recruiting, for depôts of regiments at Chatham, Maidstone, &c., and for other charges. There is also what is called the civil department of the army, or the army management, consisting of the salary of the secretary-at-war and his office, the commander-in-chief and his office, the medical departments, &c. By an act passed in the reign of George IV., a sum of £60,000 is paid into the exchequer by the East India Company, on account of the charge for retiring pay and pensions, and other expenses of that nature, arising in respect of the forces serving in India. This sum is applied towards the general expenses of the state. The pay of a private in the horse guards varies from 1s. 9½d. to 2s. 0½d. per day; in the cavalry of the line, 1s. 4d.; in the foot guards, 1s. 2d.; and in the infantry of the line, 1s. 1d. When at home and in barracks, 6d. a day is deducted from this, for which the soldier receives three quarters of a pound of meat and one pound of bread. The principal part of his clothes and accoutrements is furnished at the public expense; his pay, however, is subject to a deduction of 2s. 7½d. a week, in the case of privates serving in the cavalry; 1s. 1d. a week from privates in the foot guards, and 1s. 6d. from all other privates, on account of these articles.

Besides the cavalry and foot regiments, there is another description of force called the ordnance, which includes artillery, engineers, miners, &c. They have the management of fortifications, with their guns, stores, &c., the making of rockets, and different kinds of shot for great guns. There are 827 officers and gentlemen cadets employed in this service, and 7458 men. These, with equipments, cost about £1,300,000 annually. Of the British army, 69,351 are employed at home and in the colonies, and 20,467 in the East Indies. The troops at home are chiefly lodged in barracks, as a police, near the large towns.

The statements which we have made above relate entirely to the effective force of the army, which is either on active duty or ready to be so employed. But there are a great number of persons attached to the army who do no duty, though receiving pay like others. Some of these are pensioners, who have either been long in service, or have suffered by wounds, &c.

The Navy.—Great Britain has long been renowned as a first-rate naval power: by command of its war vessels it protects its commerce, and exerts its authority in the most remote quarters of the globe. It is usual to say that Britain possesses the "dominion of the seas;" but this is only a figure of speech. The nation possesses no acquired or vested sovereignty over the ocean, acknowledged by other powers, although at times it may forcibly compel submission. The British royal navy is recruited in much the same manner as the army; but the constitution, by a singular anomaly, sanctions the forcible abduction of men from their private homes to serve on board of war vessels. This species of impressment, however, is only resorted to in cases of urgent necessity, as for instance during the heat of war. The sailors who enlist are generally young men who have served an apprenticeship on board merchant vessels; and with this preparation, they form seamen of the highest qualifications; their courage, integrity, and kind-heartedness, are a lasting theme of national gratulation. The following statement affords an idea of the present extent of, and expenditure upon, the royal navy:—

Wages of 34,465 sailors and marines,	£1,030,088
Victuals for do.,	546,628
Dockyards for building and repairing ships, including naval stores,	1,016,669
Wages to artificers in the establishments at home and abroad,	485,449
Establishments at home and abroad,	141,0[illegible]
Miscellaneous,	9[illegible],363
Admiralty office,	113,994
	£3,492,130

Besides the above, there is another expense charged in the navy accounts, such as the conveyance of troops, half-pay to officers, pensions, &c., and which amounts to £1,488,221.

The average pay of a sailor is £2 7s. per month, with victuals, which are estimated at about £1 4s. additional. Much complaint is made of the high salaries paid to people about the dock-yards; the master-workmen receiving £250 per annum, and the artificers from 5s. to 12s. 6d. per day. During the war with France, Great Britain had upwards of 1000 ships, manned by 184,000 seamen.

In 1835 there were in commission 1 first-rate (three-decker), a ship whose war complement exceeds 1000 men; 3 second-rate, war complement above 700; 8 third-rate, war complement above 600; 8 fourth-rate, war complement above 400; 6 fifth-rate, war complement above 250; 13 sixth-rate, complement below 250; and 136 smaller vessels. In ordinary, 14 first-rate; 16 second-rate; 50 third-rate; 14 fourth-rate; 75 fifth-rate; 13 sixth-rate; and 89 small vessels; in all, 443 vessels. This does not include smaller vessels, such as yachts, cutters, transports, &c., which amount to between 200 and 300 more. We give the list of 1835 in preference to that for 1840, as the navy in the latter year was much greater than it is probable it will continue at. At present there are 234 of all kinds of vessels in commission, and 43,000 sailors and marines employed in the navy service.

The ships in ordinary are vessels which are dismo

wed, and put aside in a harbour, with only a few persons on board to take care of them. A ship in service, or even thus taken care of, will waste and rot, it is said, in fourteen or sixteen years; but a plan has lately been devised by which those not in service may be hauled up out of the water, and placed under a dry shed, which it is expected will make them last much longer.

The cost of building a first-rate ship of war differs according to the price of wood, stores, &c. One of 120 guns, and 2602 tons burden, requires 5880 loads of timber, 20,101 yards of canvas, and 30,250 fathoms of rope, for hull, masts, yards, &c., and costs £100,394.

There are six marine arsenals or dockyards—Deptford, Woolwich, Chatham, Sheerness, Portsmouth, and Plymouth. The principal foreign stations for the navy are Gibraltar and Malta in the Mediterranean; Halifax and Quebec in North America; Jamaica and Antigua in the West Indies; and Trincomalee and Bombay in the East Indies.

RELIGION AND THE CHURCH.

The United Kingdom is a Protestant state, but all religions (not offensive to public or private morals) may be professed, and their different forms of worship practised, without interference from any quarter whatever. All denominations of Christians have their own churches, employ whom they please as their pastors, and are equally under the protection of the law. The empire contains several established or predominant churches, which are supported by special acts of the legislature. In England and Ireland, there is one church, denominated the *United Church of England and Ireland* (separate before the union of the two countries in 1800), being a Protestant Episcopacy. In Scotland, the established religion is Protestant Presbyterian. According to the constitution, the religion of the English church, and also the law of England, are established in every colony by the simple act of adding the territory to the crown, unless there be a special provision to the contrary. Thus the church of England prevails in all the great colonial dependencies, except Lower Canada, which is guarantied a Roman Catholic hierarchy; the Cape of Good Hope, which has been guarantied Protestant Presbyterianism; Malta, which is Roman Catholic; and so on with some minor colonial possessions.

Church of England.—The affairs of the church are managed by archbishops and bishops, but no step of any importance, out of the ordinary routine, can be taken without an act of Parliament, and therefore the church may be said to be governed by the legislature of the country. The sovereign is the head of the church, which is thus in intimate union with the state. The laity, except through their representatives in the House of Commons, possess no right to interfere in any shape whatever with the doctrines or practice of the church. The doctrines defined by law are contained in the Thirty-nine Articles, and the form of worship is the Book of Common Prayer. (See HISTORY OF THE CHURCH.) Ecclesiastically, the country is divided into *dioceses*, each of which is under the care of a bishop or archbishop; the dioceses are classed under two *provinces*, each of which is under the charge of an archbishop. At the end of 1839, the dioceses were as follow:—*Province of Canterbury*—Canterbury, London, Winchester, Litchfield and Coventry, Lincoln, Ely, Salisbury, Exeter, Bath and Wells, Chichester, Norwich, Worcester, Hereford, Rochester, Oxford, Peterborough, Gloucester and Bristol, Llandaff, St. Davids, St. Asaph, and Bangor. *Province of York*—York, Durham, Carlisle, Chester, Sodor and Man, and Ripon. Gloucester and Bristol were separate till lately. It is designed to unite the diocese of Sodor and Man to that of Chester, and the diocese of St Asaph to that of Bangor. Ripon is a new bishopric; and a bishopric of Manchester is also to be erected, its see being the county of Lancaster, which has hitherto formed part of the bishopric of Chester. The Archbishop of York is styled "Primate of England;" and the Archbishop of Canterbury, who ranks next to the royal family, is styled "Primate of all England." The other dignitaries of the church are archdeacons, deans, and prebendaries; the inferior clergy are rectors, vicars, and curates. Strictly there are only three grades, bishops, priests, and deacons, all clergymen belonging to one of these. The bishops are entitled to be addressed as "my lord," being legally spiritual peers. The revenues exigible by law for the support of the church are most unequally distributed, and the dioceses are of very unequal proportions. The same may be said of the working clergy, some of whom have wealthy and others very poor benefices; and some enjoy several benefices, while curates or assistants are paid on the meanest scale. The following table, extracted from a parliamentary paper, shows the number of benefices or livings, parishes, churches and chapels, with the population, in 1831:—

DIOCESE.	Number of Benefices.	Number of Parishes.	Churches and Chapels.	Population.
St. Asaph, - -	160	139	143	191,156
Bangor, - - -	131	179	192	103,712
Bath and Wells,	440	479	493	403,705
Bristol, - - -	255	298	306	232,036
Canterbury, - -	343	369	374	405,272
Carlisle, - - -	128	100	129	135,002
Chester, - - -	616	530	631	1,883,958
Chichester, - -	266	289	302	254,460
St. David, - - -	451	525	561	358,451
Durham, - - -	175	140	241	460,023
Ely, - - - - -	156	158	160	133,722
Exeter, - - -	607	681	711	705,416
Gloucester, - -	283	296	330	315,512
Hereford, - - -	226	346	360	200,327
Llandaff, - - -	194	221	228	181,244
Litchfield and Coventry, - - -	623	650	655	1,045,451
Lincoln, - - -	1,273	1,370	1,377	899,468
London, - - -	577	650	689	1,722,685
Norwich - - -	1,076	1,178	1,210	690,139
Oxford, - - -	208	207	237	140,700
Peterborough, -	305	335	338	194,330
Rochester, - -	93	107	111	191,875
Salisbury, - -	408	451	474	384,683
Winchester, - -	389	408	404	729,007
Worcester, - -	222	230	260	271,687
York, - - - -	828	741	870	1,496,538
Total, - - -	10,533	11,077	11,825	13,807,187

In 1831, on an average of the previous three years, the revenues of the archbishops and bishops amounted in the aggregate to £160,292 per annum, and are now believed to be about £150,000. The largest incomes were those of the Archbishop of Canterbury, £19,182; Bishop of Durham, £19,066; Archbishop of York, £12,629; Bishop of London, £13,929; Bishop of Winchester, £11,151; and Bishop of Ely, £11,105: the others were from about £1500 to £5000. The greater part of these revenues are derived from lands, or rents for grounds let on leases, and for which fines are taken at entry. The chapters of cathedrals, composed of deans, canons, and prebends, possess also large revenues; the dean of Durham, for instance, having £4800 a year, and other members of the chapter, £32,160. In 1834, the gross revenues of the deans and chapters amounted to upwards of £235,000. The revenues of the inferior or parochial clergy are derived from tithes commuted into money payments, and also fees at celebrating marriages, baptisms, and funerals. With respect to the parochial branch of church emoluments, we extract the following from Mr. M'Culloch's Statistical Account, 1837:—

"It appears that of 10,478 benefices, from which returns have been received, 297 are under £50 a year; 1629 are between £50 and £100 a year; and 1602 are between £100 and £150; so that there are 1926 benefices under £100 a year, and 3528, or more than a third of

all the benefices in the country, under £150 a year. On many of these benefices there are no glebe houses, nor do they possess the means of erecting any. Were the spiritual duties of the poorest of these livings not performed by the clergymen of the neighbouring parishes, it is difficult to see how they could be performed at all." Curates are paid by the rectors or vicars, whose servants they are; by law their salary cannot be under £80—the average is £81.

The total revenues of the church may be stated in general terms as follow:—

Archbishops and bishops, - -	£150,000
Cathedral and collegiate churches, -	250,000
Deans and other functionaries -	60,000
10,540 parochial benefices, - - -	3,100,000
Curates of resident clergy, - - -	87,000
Curates of non-resident clergy, - -	337,000
	£3,984,000

A proposal to introduce a greater equality into ecclesiastical salaries has for some time engaged the consideration of ecclesiastical commissioners; and lately an act of Parliament was passed appropriating revenues from certain sinecure offices in cathedrals, as they become vacant, to increase the incomes of the poorer classes of parochial incumbents.

The appointment of the clergy to benefices is as follow:—Presented by the crown, 952: by archbishops and bishops, 1248; by deans, chapters, and ecclesiastical corporations, 2638; by universities, colleges, and hospitals, 721; by private individuals, 5096; and by municipal corporations, 53. This, says M'Culloch, is not exactly correct, there being upwards of 200 omitted in the returns.

In 1831, the total number of congregations belonging to the established church was 11,825. At the same time there were the following number of congregations of dissenters:—Roman Catholics, 416; Presbyterians, 197; Independents, 1840; Baptists, 1201; Calvinistic Methodists, 427; Wesleyan Methodists, 2818; other Methodists, 666; Quakers, 396; Home Missionary congregations, 453; total of dissenting congregations (exclusive of Jews), 8414. It is considered probable that this number includes as many actual worshippers as the 11,825 congregations of the establishment, or about 4,000,000. Thus, reckoning dissenters and members of the established church at 8,000,000, about 6,000,000 remain who cannot be said distinctly to attend any place of public worship, though in most instances nominally belonging to the established church.

Church of Ireland.—In Ireland, the established religion is the Protestant Episcopacy, of which another branch is established in England. Thus the same doctrines, ritual, and forms of ecclesiastical government exist in these two countries, the hierarchies only being different with respect to their political status. At present, considerable alterations are in the course of being carried into effect with regard to the higher orders of the Irish clergy and their dioceses. Hitherto there have been four archbishoprics—Armagh, Dublin, Cashel, and Tuam, with thirty-two dioceses consolidated under eighteen bishops. When the new arrangement is carried fully into effect, by the demise of certain functionaries, there will be only two archbishops, those of Armagh and Dublin, and ten bishops. The Archbishop of Armagh is styled "Primate and Metropolitan of all Ireland;" and the Archbishop of Dublin is styled "Primate and Metropolitan of Ireland." There have hitherto been 33 deans and 30 chapters of cathedrals. The number of parishes, including perpetual curacies, is (or was lately) 2405, but many have no church, and the number of incumbents for the whole is 1385. According to the proposed arrangements, the money saved by the extinction of higher offices is to be appropriated to sustain churches and glebe-houses in parishes, and to execute other necessary purposes.

The revenues of the archbishops and bishops, in 1831, amounted to £151,128 annually; and the total income of the church, including value of glebe-lands and tithes, was £865,535. (*Parliamentary paper.*) The tithes of most parishes have since been compounded for. Mr. M'Culloch estimates the amount of composition for all the parishes at £704,313, 15s.

The Roman Catholic church in Ireland consists of four archbishoprics and twenty-three bishoprics, with parochial divisions and a body of clergy similar to the plan of the establishment; to it also belongs a considerable number of monasteries. After the Roman Catholic body the chief dissenting communion is that of the Presbyterians, in the northern parts of the country. The following table, drawn up by properly appointed commissioners, shows the state of religious parties in Ireland in 1834:—

PROVINCES.	Members Estab. Church.	Roman Catholics.	Presbyterians.	Other Protest. Dissent.	Total of all sects.
Armagh, -	517,722	1,055,123	638,073	15,823	3,126,741
Dublin, -	177,930	1,063,681	2,517	3,162	1,247,290
Cashel, -	111,813	2,220,340	966	2,454	2,335,573
Tuam,	44,599	1,188,569	800	369	1,234,337
Total,	852,064	6,427,712	642,356	21,808	7,943,940

According to law, two days throughout the year, exclusive of Sundays, are set apart as holidays, or sacred from labour, in England and Ireland, namely, Christmas and Good Friday.

Church of Scotland.—Protestant Presbyterianism, according to a polity introduced from Geneva, by Knox, was established in Scotland, by act of Parliament, in 1560, a few years after the previous Roman Catholic church had been completely dismembered and suppressed. The history of the country describes the struggles of this form of church government with Episcopacy during the greater part of the seventeenth century. Shortly after the revolution, an act of Parliament of William and Mary, in 1690, re-established Presbytery on the model of a statute of 1592. According to the plan thus established, and never afterwards materially altered, the clergy of the Church of Scotland are all equal in rank, and are officially ministers of parishes. To the church belongs a body of lay functionaries called elders, each church having several, who assist the clergyman at the communion, visit the sick, and generally act as a vigilant ecclesiastical police. This incorporation of laity with the church has given it a remarkably secure footing in the affections of the people. The ecclesiastical community is governed by a series of courts—the lowest being the kirk-session in every parish, composed of the minister and elders; the next is a court composed of the clergy of a division, called a presbytery, and an elder from each parish; the next is a synodal court, composed of functionaries from an aggregation of presbyteries; and the highest is the General Assembly, composed of delegates from the presbyteries, and which meets annually at Edinburgh. Constant residence in their parishes is obligatory on the clergy.

A few years ago, before recent alterations of doubtful legality, there were in Scotland 80 presbyteries, 1025 parishes, and 1050 ministers, some churches having two clergymen. The church has lately included ministers of chapels of ease in its judicatories; and if this be ultimately sanctioned as lawful, the above number of clergymen will be considerably increased. Nearly the entire body of clergy (ministers of chapels of ease, of *quoad sacra* parishes, not included) are appointed by lay patrons, or by the crown, in virtue of an act of Parliament in 1711–12, reviving ancient rights. The General Assembly, in 1834, passed an act, usually called the

Act, giving male communicants, heads of families, the right of objecting to the appointments by patrons; but this has been declared illegal by the civil courts, as interfering with the private property of patrons (the advowsons being saleable), and the question remains in a doubtful and precarious state (January, 1841).

The parochial clergy are supported by money stipends levied from the heritors or landowners, on the principle of commuted tithes or teinds. The amount of stipends yearly, depends on the average market value of corn, the averages being called *fiars*, which are struck annually by a jury in every county. Each minister being entitled to a certain quantity of grain, the value of the quantity, according to the fiars, is paid in money. If the teinds in the hands of the heritors be not all uplifted, the stipend is liable to be increased at the end of every twenty years. In 1838, the gross amount of teinds, paid to the clergy annually, was £146,942, and the amount left unappropriated in the hands of private individuals was £138,186. It is not stated by any authority we have consulted, what unappropriated teinds are in the hands of the crown; but it appears that there are bishops' teinds (formerly revenues of bishops), amounting to £15,741 annually, of which a portion is drawn by the crown, and £10,182 unappropriated. The total income of the church, including value of glebes and manses, is calculated at £274,620, being on an average of £256 each. In some parishes the exigible stipend is so small, that it is made up to a minimum of £150 by government. Among the largest stipends are those paid to the eighteen parish ministers of Edinburgh, who receive about £500 each, levied by a peculiar law as a money-tax from the inhabitants. The expense incurred for building and maintaining the fabrics of the churches and manses is defrayed by the heritors along with the stipends.

In Scotland, no secular days, such as Christmas and Good Friday, are legally set apart as holidays, the Scottish church recognising no saint's days or holidays whatsoever. But in each parish there are one or two fast days in the year, previous to the celebration of the communion.

Scotland abounds in dissenters, the bulk of whom are only separatists from the church, and, under various names, possess the same doctrines and formula. Besides these dissenters, there is a considerable body of Protestant Episcopalians, in communion with the Church of England; also Roman Catholics and Independents. The number of congregations belonging to the Established Church, and various dissenting bodies, may be summed up as follows:—Established Church, 1060; United Associate Synod, or Secession Church, and other Presbyterians, 550; Independents, 100; Episcopalians, 80; other Protestant sects, 40; Roman Catholics, 60; total, 1880.

EDUCATION.

England.—England is almost the only country in Europe in which there is no public or general system of elementary education. For the instruction of her clergy and gentry, she has several great public classical schools, among which are those of Winchester, Westminster, and Eton, and also two great universities, Oxford and Cambridge, but she has no national establishment, like those which exist in Prussia, Holland, and other countries. Elementary instruction is given to the children of the poorer classes by endowed and charity schools, and the children of the middle classes are chiefly educated at schools of private teachers.* In 1818, there were in England 4167 endowed schools, 14,282 unendowed schools, and 5162 Sunday-schools, educating 644,000, or one-sixteenth of the entire population, instead of the sixth, which Prussia has shown to be the proper amount of school-attenders. Thus England was shown to enjoy little more than a third part of the proper amount of education, even supposing the education she did enjoy to be good. Of the 11,000 parishes, 3500 were, in 1820, without a school.

Between 1818 and 1833, considerable advances were made in the establishment of infant and ordinary day schools; and in the last-mentioned year, the statement of schools throughout England and Wales, according to a parliamentary paper, was as follows:—

	Schools.	Scholars
Infant schools,	2,985	89,005
Daily schools,	35,986	1,187,942
Total,	38,971	1,276,947
Maintenance of infant and daily schools:—		
By endowment,	4,106	153,764
By subscription,	2,820	178,517
By payments from scholars,	29,141	732,449
By subscription and payment from scholars,	2,895	212,217
Sunday-schools,	16,822	1,543,890
Maintenance of Sunday-schools:—		
By endowment,	571	39,533
By subscription,	15,244	1,423,377
By payments from scholars,	101	5,718
By subscriptions and payments from scholars,	912	80,262
Schools established by Dissenters:—		
Infant and daily schools,	925	51,822
Sunday-schools,	6,247	750,107
Increase of schools between 1818 and 1833:—		
Infant and daily schools,	19,645	671,243
Sunday-schools,	11,285	1,123,397
Schools to which lending libraries are attached,	2,464	

In 1833, when this statement was compiled, the population of England and Wales was estimated at 15,000,000; the total number of scholars, therefore, as above enumerated at 1,276,947, gives the ratio of about 1 in 15 of the population at school. Since 1833, additional schools have been opened, particularly in connection with factories, mechanics' institutions, and by subscription. At present, a considerable proportion of the humbler order of schools are in connection with two great rival societies—the British and Foreign, and the National, both of whose head establishments are in London. Recently, an annual grant of £30,000 has been made by Parliament, to enable the privy-council to encourage elementary instruction in such schools as will submit to the supervision of an inspector. Religious sectarian differences have as yet frustrated every other step towards the establishment of a national system of education.

Ireland.—The chief educational establishment in Ireland is Trinity College in Dublin; and latterly a collegiate institution for conferring the higher branches of instruction has been established in Belfast. Elementary education has in recent times made great advances in this part of the United Kingdom. In 1831, there was established by act of Parliament a national system of education, the main feature of which is an arrangement by which the children are separated at certain times, and taught religion by their respective pastors—the necessary funds being provided by the state. By this means it was hoped that the great body of the people, and more particularly the children of the poorer class of Catholics, would at length be brought within the pale of education. We need not say how differently the plan has been regarded by various parties, both in Ireland and in Britain. The national board consists of nine commissioners chosen from both the Roman Catholic and Protestant bodies—the Roman Catholic and Protestant archbishops of Dublin being among the number. The commissioners receive from the public purse, and expend annually, the sum of £50,000: their estimate for the year ending March 31, 1840, was £50,357, which they proposed to

* It is believed that, at this moment, the incomes of the estates and other property left for educational purposes, would amount, if properly managed, to £400,000 a year.—*M'Culloch*, 1841. It may be added, that, besides the misappropriation of this sum, much of that which is actually expended on the antiquated education of the grammar schools is little better than thrown away. The abuse of educational endowments in England is a great national evil, requiring speedy correction.

lay out as follows:—On training of teachers, £2220; model schools, £390; grants towards building and establishing new schools, £12,000; salaries and gratuities to teachers, £23,000; infant schools, £220; agricultural schools, £150; inspection, £4975; books and school requisites, £4250; and general expenditure, £3152. The fee paid by each scholar is 1d. per week. In March, 1838, the number of national schools was 1384, attended by 160,548 children; but 195 new schools were soon to be opened, and it was expected that they would be attended by 40,106 pupils, making a total of 209,654. Reckoning, however, the schools said to be in actual operation in March, 1838, there were then upwards of 169,000 children receiving a regular elementary education, at an annual cost to the state of £50,000.

Besides this great national system of elementary instruction, the country possesses several religious or charitable associations for promoting education among the poorer classes: of these the principal are the Kildare Place Society, which lately supported 1097 schools, attended by 81,178 scholars, and the Church Education Society. The Roman Catholic body also supports a considerable number of schools.

Scotland possesses five colleges or universities for the higher branches of instruction, being those of Glasgow, St. Andrews, King's College and Mareschal College Aberdeen, and Edinburgh. Education at these institutions is generally conferred on a more liberal and less expensive scale than at the universities of England. Scotland has been long distinguished for its parochial institutions for elementary instruction, and also for its grammar-schools or academies in the chief towns, which serve as preparatory gymnasia for the universities. Each parish (some parishes in towns excepted) is provided with a school at the expense of certain landowners or heritors, in virtue of an act of Parliament passed in 1696, re-establishing statutes formerly in existence. Another act was passed (43 Geo. III. c. 54) in 1803, amending existing provisions on the subject, and ordaining "that the salary of each parochial schoolmaster shall not be under £16, 13s. 4d., nor above £22, 4s. 5½d.," except in particular cases mentioned; and provision is further made for augmenting this minimum and maximum at the end of every twenty-five years. An increase accordingly took place in 1828, raising the minimum to £25, 13s. 3⅓d., and the maximum to £34, 4s. 4½d. These payments are made according to the liberality of the heritors; and they besides must provide a small house for the schoolmaster, with a garden, as well as schoolhouse. The teacher is entitled to take small fees in addition, the more common fee is 2s. or 2s. 3d. per quarter for instruction in reading, with 6d. for writing. Altogether, this class of men are slenderly remunerated for their extremely valuable services. Within the last thirty years, the parish schools have been almost superseded in some quarters by the establishment of voluntarily supported institutions, better suited to the wants of the age.

In a report to Parliament in 1834, the number of schools in Scotland was stated as follows:—Parochial schools, 1047; pupils attending them, 68,293; total emoluments of teachers, £53,339. Voluntarily supported schools, 3995; pupils attending them, 154,160. It appears from this that there were 222,453 children receiving instruction (not including the attendance at Sunday-schools), and that of these only 68,293, or little more than one-fourth, were educated at the parochial schools. There were 5042 schools, and of these only 1047, or about one-fifth, were parochial establishments. The publication of this report caused considerable surprise, for it was generally believed that the great bulk of the juvenile population were instructed in the parish schools. The total emoluments of the parish teachers are stated at £53,339, or on an average, nearly £51, each; but of this sum only £29,642 is stated as salary there being collected in school fees, £20,717, and from other sources, £4975. The average annual expense of educating each child at the parochial schools, on the above data, appears to be 15s. 7½d. A great difference was found between the attendance of males and females. Taking the entire attendance on schools, there were 132,489 males, and 89,964 females. The result of the Inquiry seems to be, that about 1 in 9 of the population in Scotland attends school.

The generally imperfect instruction among the humbler orders of society in all parts of the United Kingdom is strikingly manifested in the returns of criminal commitments. On this interesting topic we extract the following results of an inquiry instituted with respect to education and crime, and lately imbodied in a pamphlet read before the Statistical Society of London, by Rawson W. Rawson, Esq.

"1st, That only 10 in 100 of the criminal offenders committed for trial in England and Wales are able to read and write well, and of these only 4 in 1000 have received such an amount of instruction as may be entitled to the name of education; and that these proportions are greatly below the average standard of instruction among the general population.

"2d, That these proportions are considerably higher in Scotland, and lower in Ireland; and the evidence appears to establish that the degree of instruction possessed by criminal offenders is an indication of that possessed by the general population in the same districts.

"3d, That above one-third of the adult male population of England cannot sign their own names, and that from one-fifth to one-fourth can neither read nor write.

"4th, That these proportions are much more favourable than in France or Belgium, where one-half of the youths at the age of eighteen could neither read nor write. The proportion of wholly ignorant criminals in those countries is correspondingly greater than in England.

"5th, That in England, instruction is twice as prevalent among male as among female criminals, and one-half more prevalent among males in the general population than among females. That in Scotland and Ireland it is three times as prevalent among the male criminals.

"6th, That this unfavourable condition of females in these two countries is further confirmed by the fact, that the proportion of female to male criminals is greater than in England; and it may be traced to the circumstance of the number of girls at school in those two countries being very small in comparison with the number at school in England. In comparing the three countries, the number of female criminals is found to be exactly in the inverse ratio to the proportion of females at school.

"7th, That education has a greater influence among females than among males in restraining them from the commission of crime.

"8th, That instruction prevails, upon an average, to a greater extent among the agricultural than among the manufacturing counties of England; but that the agricultural counties in the east, east-midland, and south-east, are greatly below the average."

DISPENSATION OF LAWS.

Justice, civil and criminal, is administered in England and Ireland according to laws and forms which took their rise in the former country, and were in time extended to the latter. The English law, as it is comprehensively termed, is of two kinds—written or statute law, consisting of the laws established by acts of Parliament, and consuetudinary law, consisting of customs which have existed from time immemorial, and have received the

function of the judges. Consuetudinary law is again divided into common law and equity; the former is administered by courts which profess to adhere strictly to the old laws of England, except in as far as they are altered by statute; the latter was founded upon the principle that the king, in cases of hardship, was entitled to give relief from the strictness of the common law. Equity, though thus originated, has now become also a fixed kind of law, and is administered in courts which decide according to established rules.

The principal court for civil suits is the Court of Common Pleas. The Court of King's (or Queen's) Bench, which was at first only a criminal tribunal, and the Court of Exchequer, which was designed only to decide in cases concerning the revenue, have become civil courts by means of fictions in their respective modes of procedure. The Court of Chancery, presided over by the Lord Chancellor, administers the law of equity. Courts under these designations sit both in Westminster and in Dublin: there are also courts of assize, which, in England, perform six provincial circuits, in some instances once, and in others twice a year. Minor cases, criminal as well as civil, are judged by bodies of provincial magistracy, who meet in every county once every quarter of a year. Besides the civil and criminal tribunals, there are ecclesiastical courts, which have jurisdiction in matters connected with marriage, wills, &c., and adopt the principles of the old canon law. There are also courts of admiralty, which decide questions between persons of different nations, according to the code of civil law recognised throughout Europe.

Guernsey, Jersey, Alderney, and other small islands in the British Channel, which politically belong to the United Kingdom, possess a variety of peculiar privileges and legal usages. The Isle of Man, situated in the sea between England and Ireland, likewise possesses certain peculiar privileges.

In Scotland, laws peculiar to itself, founded upon the principles of the Roman and the Feudal law, are administered by a supreme civil tribunal, denominated the Court of Session, which remains fixed at Edinburgh, and by a criminal tribunal, named the Court of Justiciary, which not only sits in the same city, but makes circuits through the provinces. Minor civil and criminal cases are also judged in Scotland by the sheriffs of the various counties, and the magistrates of the boroughs.

Scotland possesses the advantage of public prosecution of offences, the injured party being only a complainer to the public prosecutor. The chief public prosecutor is the Lord Advocate; the inferior public prosecutors, in connection with the various minor courts, are termed procuratore-fiscal. The whole expense of prosecution is defrayed by the national exchequer.

The peculiar boast of the criminal law of the British empire, is the *Jury*. In England and Ireland, where the principle of the criminal law requires the injured party or his representative to prosecute, he can only do so by permission of a jury of accusation, called the Grand Jury; another jury sits for the purpose of deciding if the evidence against the accused has established the guilt. These juries consist in England and Ireland of twelve men, whose verdict must be unanimous; in Scotland, the jury upon the charge consists of fifteen men, who decide by a plurality of votes. The jury is an institution of Scandinavian origin, transmitted to Britain through the Saxons, and it is justly considered as a most efficient protection of the subject from the vindictiveness of power. Civil cases, turning upon matters of fact, are also decided in all parts of the United Kingdom by juries.

The House of Lords, as the great council of the sovereign, acts as a court of last appeal from the civil tribunals of Britain and Ireland. Practically, the business of hearing these appeals is undertaken by some law lord, such as the Lord Chancellor, who, as there must be three persons present, is usually accompanied by a temporal peer and a bishop. Before deciding, the House sometimes demands the opinions of the English judges.

The laws and judicial usages of England are extended to most of the colonial possessions, along with all the rights and privileges which are common to British subjects. Hence, the inhabitants of the most distant part of the empire, whatever be their origin, rank, or colour, are entitled by the constitution to enjoy the same [illegible]ree of civil and religious liberty, and the same careful [illegible]ction of life and property, as their fellow-subjects in the mother country. This is an invaluable boon, for in no nation do the people practically enjoy greater liberty of speech or action (without licentiousness), and in none is the press more unshackled. Next in point of value to the privilege of trial by jury, the British subject places the *right of petition* to the House of Parliament, either for an improvement in the laws or a redress of grievances. As this involves the right of assembling publicly in a peaceful manner, or of *meeting constitutionally*, to discuss measures of government and legislation, it is allowed to form the impregnable bulwark of British political freedom.

COLONIAL POSSESSIONS.

The foreign possessions of the United Kingdom are infinitely more extensive and populous than the home country. They are about thirty in number, reckoning all classes of foreign stations and possessions, and lie in every quarter of the globe. The oldest existing colonies are the West Indies, chiefly consisting of a series of islands stretching across the great bay which nearly divides North from South America. Britain is mistress of Canada, New Brunswick, and Nova Scotia, on the mainland of North America, with Cape Breton, Prince Edward Island, and Newfoundland, on the coast. On the mainland of South America she possesses British Guiana. In the southern ocean she has appropriated the vast continent of Australia, containing the colonies of New South Wales and South and West Australia, also near its coast the island of Van Diemen's Land. In an easterly direction from these she possesses the New Zealand Islands; and near Cape Horn she possesses the Falkland Islands. In Asia she occupies a large part of Hindostan, and near its shores the large and beautiful island of Ceylon. In the Indian Ocean she possesses the Mauritius, and in the Atlantic the islands of Bermuda, Ascension, and St. Helena. On the continent of Africa, the principal British colony is the Cape of Good Hope, which is at present among the most thriving of our foreign possessions, and is almost the only spot in Africa in which civilization has been successfully planted. On the western coast of Africa lie the British colonies and military and naval stations of Sierra Leone, Gambia, and Fernando Po. In the Mediterranean, Britain has under her protection the Ionian Islands, and possesses Malta and Gibraltar, the latter being merely a military post at the southern extremity of Spain. In the German Ocean she holds the small island of Heligoland.

All are free crown colonies, except Hindostan, which is governed by and under tribute to the East India Company; the company, however, being in some measure controlled by the supreme government and the high functionaries whom it appoints. With the religion and law of England have been generally introduced the English language, usages and manners. The colonies possess little or no independent power. They are locally managed by governors and other functionaries appointed by the crown, and are subject to numerous regulations imposed by the imperial Parliament or by the colonial secretary. Canada, Nova Scotia, New Brunswick, Newfoundland, Jamaica, and other West Indian possessions, and the Cape of Good Hope, individually possess local legislatures, or parliaments, by which various interna concerns, such as making roads, education, imposition of

dues on shipping, &c., to defray expenses, are managed. The colonies are not taxed to support the home government, it being a principle in the constitution that there can be no taxation without representation; but they are subjected to various custom-house duties and restrictions, that greatly limit their capacity for improvement. All the raw produce they can export, such as sugar, coffee, timber, &c., is permitted to enter British ports at a duty much lower than the same kind of produce from foreign countries. This preference is in one respect advantageous to them; however, they are at the same time restricted in the purchase of various articles, except from Britain and its possessions. They are also prevented from manufacturing certain kinds of produce; for example, the inhabitants of Jamaica cannot refine their own sugar, but are compelled to send that article to England to be refined, and then buy it back again. By these arrangements, the colonies are, generally speaking, in a state of tutelage, and cannot, without a very great change in their affairs, start forward in a course of prosperity; while we at home, by being compelled to pay for their protection, and to buy their high-priced produce, receive no adequate benefit from their possession. The ostensible object of maintaining a connection with the colonies, is to find an outlet for British manufactures, and to employ shipping in the transport of goods. It is, however, extremely doubtful whether the expense incurred in supporting them is not much greater than all the profit derived from commercial intercourse. In a return to Parliament lately published, the following statement of the expenditure of the United Kingdom on the colonies, was given for the year ending March 1, 1836:—

Military charges, net,	£2,030,050
Civil charges, net,	480,154
Naval expenditure,	39,304
St. Helena (not classified),	90,883
	£2,646,410
Deduct repayments out of colonial revenues, &c.,	39,928
	£2,606,482

The expenditure for each colony, neglecting fractional parts of a pound, is as follows:—

MILITARY AND MARITIME STATIONS.

	Total Expenditure incurred by Great Britain.
Gibraltar,	£130,830
Malta,	110,818
Cape of Good Hope,	242,907
Mauritius,	78,284
Bermuda,	91,446
Fernando Po,	510
Ascension,	4,907
Heligoland,	1,016
Ionian Islands,	118,955
St. Helena,	87,559

PLANTATIONS AND SETTLEMENTS.

Jamaica, Bahamas, Honduras,	232,429
Barbadoes, Grenada, St. Vincent, Tobago, Antigua, Montserrat, St. Christopher's, Nevis, Anguilla, Virgin Islands, Dominica, St. Lucia, Trinidad, British Guiana,	373,342
Lower Canada, Upper Canada,	221,441
Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland,	161,294
Sierra Leone, Gambia,	38,347
Ceylon,	133,805
Western Australia,	12,745

PENAL SETTLEMENTS.

New South Wales, Van Diemen's Land,	533,501
General charges,	23,449
	£2,606,483

The total value of exports to the above dependencies in 1838 (see statement of exports in another page), was about ten millions, the profit on which would be 10 per cent.; but the above sum incurred for protection is equal to 25 per cent. on the ten millions, and therefore there is a clear loss of 15 per cent. on colonial commerce. We have not seen any statement of what benefit is derived by British shipping from the colonial connection; but whatever it is, there can be no doubt that the same number of ships would be employed in the export and import trade, if the colonial connection was dissevered. It appears to us, that the only real advantage derived by Britain from her colonies, is the ready means afforded for sending large masses of her population as emigrants to these vast and fertile territories, where their settlements become the nurseries of future independent and civilized nations. In this respect, the colonial system of Britain is of immense importance to the cause of Christianity and civilization; and it is only matter of deep regret that, by proper management and the abolition of all restrictions, the colonies are not rendered more valuable and less expensive to the mother country. Reckoning the expense of military, naval, and civil protection, along with the heavy loss incurred by our obligation to buy their dear produce, it is calculated that in ordinary times the people of Great Britain lose between five and six millions annually by the colonies.

India is not, strictly speaking, a colony or possession of Britain. Politically it belongs to the Honourable East India Company, an association of British merchants, by whose servants it has been conquered, and is now locally governed, under the control and approval, however, of the crown, and a charter granted by the legislature. In virtue of an act of Parliament, passed in 1833, the East India Company is guarantied the government of the British territories in India until April, 1854; the company is not to carry on any trade; commerce to be open to British merchants; natural-born subjects of England may proceed to, settle, and buy lands in India; and natives of India, of whatever colour or religion, are to be eligible to office. India affords no direct revenue or tribute to England, as conquered countries are in general supposed to do. The only advantages which we derive from our occupation of these immense countries, are the undisputed possession of their trade, and the fortunes (sometimes very large) saved out of their salaries by British subjects who are appointed to discharge the duties of government. It is to the trade of the country, however, that we must look for any considerable and permanent advantage; and as this can only be made to increase by the cultivation of peace and order through the country, the interest of Britain becomes directly involved in maintaining henceforth the peace of India. The improvement which a few years of peace effects in these fertile countries, is astonishing: the population of a certain portion is supposed to have nearly doubled in the period of comparative peace from 1811 to 1830, being in the former year only forty five, and in the latter almost ninety, millions. Till she came under British rule, India never enjoyed twenty years of peace and orderly government in all her former history. Many faults and oppressions are laid to the charge of the English in India, from which it is impossible to defend them. The taxes (which fall chiefly upon the *land* and the poor peasantry) are very oppressive, and are rendered more so by the unprincipled conduct of the natives who are employed to collect them. Justice also is administered in a foreign language (Persic), and the courts are so few, that districts which are larger than Scotland have hardly one to each. Notwithstanding all this, the preservation of public order and of peace has conferred advantages on the country of the most inestimable kind. Latterly, considerable improvements have been effected by the establishment of schools, and by Christian missionaries of various persuasions.

The territorial extent of the British possessions in India is 514,190 square miles; the population, as far as it has been ascertained, 89,577,206; to which may be added eleven millions more for districts not included in the census. There are several states which are under British *protection*, though not directly governed by our establishments; these have an area of 614,610 square miles, and a population estimated at forty millions. The goods ex

ported from Britain in 1836 to the East Indies, including Ceylon, were valued at £3,876,196. As India, by the taxes which it pays to the Company, clears the cost of its own protection, and all its other public expenses, it may be considered as the only foreign possession of Britain whose trade affords an unburdened profit to the home country. The forces employed by the Company, partly composed of British regular troops, and partly of native levies, amounted in 1830 to 224,444 men.* In 1833–4, its annual revenue was £13,680,165, an enormous sum to be raised in a semi-barbarous country, yet no more than sufficient to discharge the annual expenses. The Company at that time was in debt to the amount of £35,463,483. (See article EAST INDIES.)

MANUFACTURING AND COMMERCIAL INDUSTRY.

Manufactures.—The manufactures of Great Britain surpass in extent and variety those of any other country; and from the superior character of its machinery, the economizing of time, and the refined skill of its workmen, the manufactures are generally produced at a lower rate, and of better quality, than in countries more favourably situated with respect to the production of raw materials.

The Cotton Manufacture is the most extensive of the whole, both with respect to the capital which it involves, and the number of people to whom it gives employment; it is supposed to form one-fourth part of the total industry of Britain. The number of work-people in its various departments (reckoning spinners, weavers, bleachers, &c.; engineers, smiths, and others engaged in the works) is estimated at 1,500,000. The capital invested in this large branch of manufacture at present is reckoned at about £30,000,000, and the total value of the goods annually produced is believed to be between £30,000,000 and £34,000,000. The raw material, or cotton wool, is brought chiefly from America, and a part also from the East Indies and Egypt. The chief seats of the manufacture are Manchester, Glasgow, and Paisley; and the magnificent apparatus of factories, machinery, and warehouses, with which these cities are filled, for this sole business, are the astonishment of all visiters. According to papers published a few years ago by the Board of Trade, there were in the empire at large 1262 cotton factories at work, and 42 empty, since the period of which estimate many more have been erected. It has been calculated that there are at least 10,000,000 of spindles and 100,000 power-looms in the United Kingdom. The cotton manufacture has latterly been greatly impeded in its tendency to increase by the establishment of cotton factories in Germany, Switzerland, and the United States, in the two first of which countries labour or food is cheaper than in Britain, and consequently goods are there produced at a somewhat cheaper rate.

The Woollen Manufacture.—This manufacture was the earliest established in England; it gives employment to above half a million of people, who receive on an average, men, women, and children, about £16 per annum. The goods manufactured are valued at twenty millions; the finer qualities of the raw material are imported from Germany, or from her colonies in Australia; the coarser are produced at home: the value of the whole is estimated at £6,000,000. This manufacture, particularly the finer kinds, is chiefly carried on in the west and north of England; both fine and coarse fabrics are now made at Galashiels in Scotland; and Kilmarnock and Stirling drive a thriving trade in carpets, bonnets, &c. In the finest kind of broadcloths, the Prussians are said still to excel the English.

The Silk Manufacture has been carried on in this country for a long period, having been first introduced in the fifteenth century by emigrants from France. It was for many years confined chiefly to Spitalfields in London, and to Coventry. There were then prohibitory duties on all foreign silks, but this, instead of fostering the manufacture, as was intended, only encouraged its proprietors in indolence, as they knew that they had the home market to themselves. These prohibitions have been partly removed since 1824; and those regulations which confined the manufacture to some particular spots, are also done away with; so that the trade has been roused from its inactivity, and a great deal more business is done than formerly. The quantity of silk for working imported in 1823 (the year before removing the restrictions) was two and a half millions of lbs.; the average quantity of the same material imported since, has been three and a half millions. The consumption of silk goods at home has increased more than a half. The annual produce of the manufacture is now estimated at £10,000,000; and it is supposed to give employment to about 300,000 work-people. Its chief seats are Spitalfields in London, Coventry, and latterly Manchester, Paisley, and Glasgow, where some of the most beautiful fabrics are now made.

The Leather Manufacture is of considerable importance. The value of the different articles of which it forms the material, is estimated at £15,000,000; this includes gloves, saddlery, boots and shoes, &c. The increase of this trade in late years has been very great; *hides* are imported from all quarters of the world, and the quantity has doubled within a few years. The number of lamb and kid *skins* imported, in 1830, was about three millions.

Iron, Cutlery and Hardware.—This is one of the manufactures in which Britain particularly excels. The abundance of her mines of iron, copper, tin, lead, and coal, and the easy access which can be had to them at all points by sea, river, or canal, give facilities which are possessed by no other country. The annual value of the manufactured goods is estimated to be above £17,000,000, and employment is given to 320,000 men in the working of copper, brass, pewter, steel, tin, and other metals. The chief seat of the manufacture of the finer and more skilled articles, is Birmingham, Sheffield, and the immediate vicinity; and from these districts metal goods of all descriptions, implements of war, and the most elegant ornaments of peace, are despatched to all parts of the world. For heavy cast-iron goods, cannon, parts of machinery, &c., Carron, in Scotland, has been long celebrated.

The Earthenware, China, and Glass Manufactures, rank next to those we have mentioned. The number of people employed cannot be easily estimated; but as no money has to be sent abroad to purchase any part of the material of these works, the whole proceeds of the goods go to pay wages at home. The annual value of the glass manufactured is about two and a half millions, and that of the pottery and earthenware about three and a half. It is believed that the trade in glass might be doubled, if relieved of the burdensome excise duties and regulations which prevent improvement.

The whole value of the manufactures of all kinds produced annually in Great Britain, is reckoned to be about £150,000,000.

Commerce.—Since the middle of the last century, the rapid progress of improvement in manufactures has continued to afford new materials and goods for exportation, and the increase of trade has been in proportion. Since 1800, the import and export trade have prodigiously increased. The late and present extent of the import and export trade of the United Kingdom is as follows:—In the year ending January 5, 1840, the official value of imports was £62,004,000; official value of exports of British produce and manufactures, £97,402,726; official value of exports of foreign and colonial merchandise, £12,795,990; total exports £110,198,716.

Quantities of the Principal Articles of Foreign and Colonial Merchandise entered for Home Consumption, in the Years ending January 5, 1839 and 1840.

		1839.	1840.
Bark,	cwt.	613,743	680,461
Butter,	cwt.	262,132	213,548
Cheese,	cwt.	219,364	202,306
Coffee,	lbs.	25,818,613	26,822,268
Corn: Wheat,	qrs.	1,740,806	2,521,111
Other kinds,	qrs.	90,937	1,920,962
Flour,	cwt.	302,847	665,002
Cotton wool:			
United States,	lbs.	389,579,134	260,422,838
East Indies,	lbs.	34,135,861	30,332,877
Brazil,	lbs.	24,727,312	17,104,527
Other places,	lbs.	12,313,716	12,921,718
Dyes: Indigo,	lbs.	3,020,170	2,719,503
Lac,	lbs.	633,861	539,599
Flax and Hemp,	cwt.	2,398,007	2,160,555
Hides,	cwt.	318,763	361,645
Molasses,	cwt.	627,080	531,781
Olive oil,	gals.	2,018,028	1,815,692
Opium,	lbs.	31,204	41,671
Pepper,	lbs.	2,635,020	2,643,584
Quicksilver,	lbs.	406,580	341,675
Rice,	cwt.	138,573	205,787
Rice in husk,	bush.	290,569	317,472
Saltpetre,	cwt.	300,206	331,485
Seeds: Clover,	cwt.	95,882	93,735
Flax and Lint,	bush.	3,198,217	3,878,765
Silk, Raw, &c.	lbs.	4,887,419	4,757,639
Spirits: Rum,	gals.	3,135,373	2,830,582
Brandy,	gals.	1,203,666	1,168,322
Sugar: West Indies,	cwt.	3,309,035	2,790,294
Mauritius,	cwt.	585,160	580,356
East India,	cwt.	418,717	478,002
Tallow,	cwt.	1,160,177	1,152,318
Tea,	lbs.	32,360,412	35,130,232
Tobacco,	lbs.	23,546,595	23,167,711
Wine: Cape,	gals.	518,900	535,124
French,	gals.	436,866	399,659
Other sorts,	gals.	6,225,110	6,304,784
Wool, Sheeps',	lbs.	56,734,625	53,221,231

Declared Value of Principal Articles of British and Irish Produce and Manufactures Exported.

	1839.	1840.
Apparel,	£586,261	£718,477
Arms, ammunition,	333,727	394,721
Beef, pork, &c.	207,112	332,120
Beer, ale,	317,358	384,324
Books,	143,966	155,715
Brass and copper,	1,221,732	1,280,506
Butter, cheese,	280,651	284,148
Cabinet wares,	77,400	80,892
Coals, culm,	485,950	542,609
Cordage,	94,630	149,345
Cotton manufactures,	16,715,856	17,692,183
Cotton yarn,	7,431,876	6,858,193
Earthenware,	651,344	771,173
Fish,	209,665	202,034
Glass,	377,284	371,208
Haberdashery,	514,117	613,950
Hardwares,	1,498,327	1,828,521
Hats,	153,339	167,738
Horses,	65,280	56,730
Iron, steel,	2,535,692	2,719,825
Lead and shot,	154,126	197,592
Leather, saddlery,	361,838	476,035
Linen manufactures,	2 820,272	3,414,967
Linen yarn,	746,162	818,484
Machinery,	627,430	683,285
Painters' colours,	177,780	236,482
Plate, jewelry,	240,584	274,305
Salt,	223,456	218,907
Silk manufacture,	777,273	868,118
Soap, candles,	351,130	466,934
Stationery,	218,912	267,574
Sugar, refined,	553,247	209,844
Tin wares, &c.	561,022	485,346
Wool,	458,306	389,156
Woollen goods,	6,179,605	6,004,965
Other articles,	1,708,071	1,927,174
Totals,	50,060,970	53,233,580

Declared Value of British and Irish Produce and Manufactures Exported from the United Kingdom to different Countries in 1838.

British Possessions.—East India Company's territories and Ceylon, £3,876,196; British West Indies, £3,393,441; British America, £1,992,457; Australia, £1,336,662; Gibraltar, £894,006; Cape of Good Hope, £623,321; Mauritius, £467,342; Channel Islands and Man, £343,854; West Coast of Africa, £413,354; Malta, £226,040; St. Helena, &c., £15,065; total, £13,581,830.

Foreign States.—Russia, £1,063,241; Sweden, £102,647; Norway, £77,485; Denmark, £181,404; Prussia, £155,223; Germany, £4,066,906; Holland, £3,540,429; Belgium, £1,0[illegible]; France, £2,314,141; Portugal, £1,165,395; Azores, £[illegible]; Madeira, £34,917; Spain, £243,869; Canaries, £47,693; Italy and Italian Islands, £3,076,211; Ionian Islands, £96,160; Turkey and Greece, £1,767,907; Syria, £188,440; Egypt, £242,[illegible]; Barbary, £74,013; East Coast of Africa, £10,765; Cape Verd Islands, £1392; Arabia, £167; China, £1,204,356; Sumatra and Java, £505,302; Philippine Islands, £31,780; New Zealand, &c., £1095; Hayti, £200,139; other Foreign West Indies, £1,026,392; United States, £7,585,760; Mexico, £439,776; Columbia, £174,338; Brazil, £2,605,604; States of La Plata, £680,345; Chili, £413,647; Peru, £412,196; total, £21,479,130.

In all, £50,060,970; of which Europe, £21,171,504; Africa, £1,647,759; Asia, £6,689,866; Australasia, £1,337,757; North America, £9,578,217; West Indies, £4,708,972; Mexico and South America, £4,726,906.

It will be observed from these statements, that the best customer of Great Britain is the United States of North America, the trade with which has prodigiously increased since the colonial connection was dissolved. The exports to Brazil are likewise considerable, being at present about £4,000,000. There is reason, however, to fear that both these countries contemplate the exclusion of British goods, in consequence of our high prohibitory duties on their produce. For a further notice of British manufactures and commerce, we refer to the article COMMERCE, and also to the articles on the various branches of manufactures.

SHIPPING.

The following statements embrace a view of the number of ships belonging to and engaged in the commerce of the British empire:—

Account of the Registered Shipping belonging to the Empire on the 31st of December, 1839, and Ships built during the previous year.

	Ships Registered.		Ships Built.	
	1839.		1839.	
	Tons.	Men.	Ships.	Tons.
England,	1,983,522	114,593	951	144,500
Scotland,	378,104	25,900	217	32,717
Ireland,	169,289	11,288	49	4,0[illegible]
Jersey, Man, &c.,	39,630	4,473	61	5,6[illegible]
Colonies,	497,798	35,029	368	47,[illegible]
Totals,	3,068,431	191,283	1646	234,[illegible]

The total number of *registered* Ships belonging to the British Empire on December 31, 1838, was 26,609, and on December 31, 1839, 27,745.

Account of Shipping employed in the Foreign and Colonial Trade of the United Kingdom in the year ended January 5, 1840, stated exclusively of Ships in Ballast.

Countries to which Ships belonged.	Entered Inwards.		Cleared Outwards.	
	1839.		1839.	
	Ships.	Tons.	Ships.	Tons.
British Empire,	14,348	2,756,533	11,952	2,197,011
United States,	579	286,658	579	291,5[illegible]
Prussia,	1,165	222,258	556	98,317
Norway,	969	134,449	265	21,7[illegible]
Denmark,	1,557	110,727	1,254	86,0[illegible]
Russia,	259	73,012	133	3[illegible]
Holland,	731	61,923	513	4[illegible]
Belgium,	313	42,141	359	52,567
France,	1,509	102,123	1,671	136,92[illegible]
Other States,	1,685	107,044	1,141	112,6[illegible]
Totals,	23,114	3,957,468	18,423	3,0[illegible]

Account of Shipping employed in the Coasting Trade in the Year ended January 5, 1840, stated exclusively of Ships in Ballast.

	Entered Inwards.		Cleared Outwards.	
	1839.		1839.	
	Ships.	Tons.	Ships.	Tons.
Employed in intercourse between Britain and Ireland,	9,221	1,176,893	17,335	1,70[illegible]
Other Coasting Ships,	121,033	9,433,511	125,560	9,[illegible]
Totals,	130,254	10,610,404	142,895	11,[illegible]

The following is the list of Steam-vessels belonging to the British Empire in 1836:—

	Vessels.	Tonnage.
England,	268	34,314
Scotland,	93	11,589
Ireland,	71	13,460
Guernsey, Jersey, and Man,	7	914
British plantations,	30	7,693
Total,	600	67,966

This is very nearly double since 1829. Now (1841) the list might be vastly increased by the addition of the Atlantic steamers, and others of great power.

None of the above accounts include the great number of canal or fishing-boats with which many parts of the coast are swarming.

PUBLIC WORKS, CANALS, RAILROADS, DOCKS, &c.

Connected with our manufactures, are the great works of the civil-engineer—canals, roads, docks, bridges, piers, &c.—works which attest, more obviously than any others, the activity, power, and resources of the country. It is to the facility of internal communication afforded by these works, that the heaviest goods, though manufactured in the interior of the country, can be carried to sea-ports for exportation, without any burdensome addition to their price; and materials for their different manufactures can be carried to inland towns from sea-ports, by canals or railroads, with the same advantage.

The length of the *Turnpike Roads* in 1829 (the latest authentic account) was 24,541 miles; annual income, £1,314,716; debt, £5,200,000. The income, of course, was from tolls, and was intended for repairing the roads and paying the interest of the money borrowed for constructing them. The total length of the canals, in the same year, was 2880 miles; the income on these canals amounted to £13,205,116, which, besides keeping them in repair, afforded an average profit to the proprietors of 5¼ per cent. on their capital.

The *Bridges, Aqueducts, and Tunnels*, which have been erected in connection with roads and canals, are more magnificent and numerous than those of any other country in the world. To estimate their number would be difficult; but we may mention, that, in London, the Waterloo and London bridges alone cost very nearly two and a half millions of money. The iron bridges which have been erected in different places are the admiration of all foreigners. Their arches are constructed of a number of strong ribs of metal, standing apart from each other like the joists of a house, and on these the floor or roadway is formed. Bridges of suspension are now also common, in which the roadway is suspended by iron bars, from strong chains which are fixed in the earth, and then hung over high pillars at each end of the bridge; by this means bridges can be constructed over deep and broad waters, where it would have been altogether impossible to stretch an arch of any other kind. On a well-frequented road, bridges costing £14,000 or £18,000 are often constructed merely to shorten the distance by a mile or two, or to avoid an inconvenient ascent in the old track. Were it possible to estimate the amount of capital laid out on this kind of improvement alone, it would be almost incredible.

The number of *Railway Companies* incorporated by act of Parliament up till January, 1839, in Great Britain and Ireland, was 107, and the capital which they were allowed to raise by shares was £41,610,814; they were besides allowed to raise by loan £16,177,630. A considerable number of these railways being jobbing, or at least crude speculations, have never commenced, and the number of railways actually begun to be prepared or finished at the beginning of 1840, in the United Kingdom, was only about fifty. The principal lines are—the Liverpool and Manchester Railway, about thirty-two miles long, and uniting these populous towns; the London and Birmingham Railway, about one hundred and twelve miles long, connecting the metropolis with the centre of England; the Grand Junction Railway, continuing the London and Birmingham line to that of Liverpool and Manchester, and also to a railway proceeding northward to Lancaster, and thus forming a most important thoroughfare obliquely across the country; the Midland Counties, North Midland, and Great North of England Railways, connecting the great seats of trade in Northumberland, Durham, Yorkshire, and Derbyshire, with the London and Birmingham line; the Newcastle and Carlisle Railway, connecting these towns; the Great Western Railway, about one hundred and seventeen miles long, connecting London with Bristol, and with smaller tributary lines opening up the west of England; the South-Western Railway, about seventy-seven miles long, connecting London with Southampton; the Manchester and Leeds Railway, connecting these populous towns. In Scotland, the Edinburgh and Glasgow Railway, and the Glasgow and Ayr Railway, are the principal lines. The most prosperous of all the lines is that of the London and Birmingham, the weekly revenue of which is upwards of £16,000: the weekly revenue of the Grand Junction, which joins it, is £9000.*

Docks, Piers, and Lighthouses.—Docks are artificial basins built of stone for the reception of ships: they are of two kinds, wet and dry. A dry dock is a receptacle where vessels are built or repaired; after which the tide is admitted by flood-gates, and they are floated out to sea. Wet docks are constructed for the use of ships when loading and unloading, it being found that when they are allowed to settle down unequally on the mud or sand of rivers and harbours, their timbers are strained, and the vessels considerably damaged; in the wet docks they are kept always afloat. The capital expended by some of the dock companies in London is immense. The capital expended by the London Dock Company in purchasing ground (chiefly the sites of houses and streets) was more than one million; and the whole cost of the works was £3,938,310.

The docks at Liverpool have an area of water of about 91 acres, and the quay space is nearly eight miles in total length. The business transacted may be conjectured from the fact, that the dues paid by vessels entering the docks in 1840, was £497,477, 18s. 6d. Few of the large sea-ports are without the accommodation which docks yield to commerce; those at Leith contain ten acres of water-room, and have cost £285,108. It would be idle to attempt a description or even enumeration of the immense number of piers and harbours which have been constructed at the different sea-ports. At every place where the profits of trade seemed to authorize such erections, capital was seldom deficient to complete them.

The *Lighthouses* of Britain are perhaps the most remarkable part of the nautical apparatus of the islands. The capital expended upon them has been large, and the skill with which some of them, such as the Bell-Rock and Eddystone lighthouses, are constructed for durability in the midst of a tempestuous sea, could only have been exhibited in a country where mechanical science existed in its highest perfection; and there is hardly a dangerous or doubtful point along the coast where the mariner is not guided by a light on some headland or rock. There is, however, much complaint concerning the dues levied from ships for lighthouse expenses; some of them are held as profitable tolls by private families, and in others the money levied is applied to purposes quite unconnected with lighting.

SOCIAL STATISTICS.

The population of the United Kingdom consists of various classes of persons, among whom, with respect to

* See article ROADS, CANALS, and RAILWAYS, for further information.

wealth, education, and general condition, even more than the usual differences are to be found. Notwithstanding great improvements in agriculture of late years, the country cannot produce wheat, oats, and other cereal grains, in sufficient abundance to meet the demands of a daily increasing and hard-labouring population, and what is deficient is excluded, except at high duties, which render the price of bread higher than it is elsewhere in Europe.* Without entering minutely into this great and much debated question, it may be mentioned as a general result, that the difficulty of purchasing food leads to a corresponding depression of circumstances in the humbler orders of the community, and either causes an extensive dependence on poor-rates for support, or produces debased and dangerous habits of living. The poor of England are entitled by law to support in workhouses, according to the provisions of an act of Parliament passed in 1834; in 1839, the money expended on paupers in England was £4,406,907, being only about two-thirds of what had, during some years, been expended under a somewhat different system, and a less careful administration of funds. In Ireland, a similar poor-law has lately been introduced, and is likely to prove of great service to that part of the empire. In Scotland, none but the impotent or very aged poor can legally claim relief from the parish funds: these are very inadequately supplied. The humbler classes are accordingly, in many places, in a very miserable condition. The entire outlay for the parochial poor in Scotland was lately no more than £140,000.

The present condition of society throughout the United Kingdom exhibits the spectacle of great and valuable efforts at improvement among the more enlightened classes. Within the last ten years, the utility of the press has been immensely increased, and works of instruction and entertainment have been circulated in departments of society where formerly nothing of the kind was heard of. The establishment of mechanics' institutions, lyceums, exhibitions of works of art, reading societies, and other means of intellectual improvement, forms another distinguishing feature of modern society. At the same time, great masses of the people, for lack of education, and from other unfortunate circumstances, are evidently gravitating into a lower condition. From these reasons, and others connected with the development of our manufacturing and commercial system, convictions for crime have been latterly increasing. In 1837, there were 17,090 convictions for crime in England. The late establishment of an improved prison system in Scotland, independently of other advantageous circumstances, is expected to greatly lessen the number of offenders in that part of the empire.

England is now provided with a law for enforcing the registration of births, marriages, and deaths; but in other parts of the empire, Scotland in particular, the arrangements for these useful objects are very imperfect. During the year ending June 30, 1839, the number of births, marriages, and deaths, in England and Wales, was as follows:—births, 480,540; marriages, 121,083; deaths, 331,007. This enumeration, compared with the previous year, shows, for births, an increase of 80,828; for deaths, a decrease of 4949; and for marriages, an increase of 9602. At the celebration of marriage, parties are required to sign their names; and it appears that, on an average, 33 in the 100 of males, and 49 in the 100 of females, sign with a mark, being unable to write. The average age of men in England at marriage is about 27 years, and of women, 25 years and a few months.

An account of the population of the empire has been taken at intervals of ten years from 1801; and the following table will show the gradual increase which has occurred during these intervals.

	1801.	1811.	1821.	1831.
England and Wales,	8,872,980	10,163,876	11,978,875	13,894,569
Scotland, - - -	1,599,068	1,805,688	2,093,456	2,365,807
Ireland, - - - -	—	4,500,000	6,802,093	7,734,368
Army and Navy, -	470,500	640,500	319,300	277,017
Totals,	10,942,548	17,109,964	21,193,724	24,271,759

The increase of population has been greatest in the manufacturing districts, where, in some instances, it has been double of those which are merely agricultural; as, for example, the increase in the manufacturing counties of England, from 1821 to 1831, was 22 per cent., while in the agricultural counties it was only 10½. It has been ascertained, that, in 1831, there were of the classes belonging to the aristocracy in Great Britain, from 3000 to 4000 families; of squires and gentlemen, who are landproprietors, stockholders, money-lenders, &c., from 50,000 to 60,000 families; of learned professions—36,000 clergy of all denominations, about 30,000 lawyers, and 50,000 physicians, surgeons, apothecaries—making 116,000 families, with half as many more dependents; of farming tenants, about 250,000 families, and of their labourers, 400,000 families; of merchants, shopkeepers, and general traders, 900,000 families; of artisans, 200,000 families; of manufacturers in all lines, 500,000 families, of labourers, porters, and servants, 600,000 families; and of destitute paupers, soldiers, &c., 800,000 families.

The statement of the aggregate population of the British islands, affords no idea of the force which is actually employed in agriculture and manufactures. The effective labourers (men) are estimated to amount to no more than 7,000,000, whereas, reckoning the powers exerted in productive industry by animals, mills, steam-engines, and mechanism of various kinds, the force is equal to the strength of more than *sixty millions* of working men.

An estimate was formed a few years ago of the total annual income of all classes of people in the United Kingdom, with the aggregate value of the articles of use and luxury which each produces, and from this we make the following extract:—

Value of agricultural and dairy produce, -	£236,000,000
... Mines and minerals, - - - -	21,400,000
... Inland and foreign trade, - - - -	57,773,000
... Manufactures, - - - - - -	148,050,000
Total of produce and property annually created in Great Britain, - -	£503,223,000

An estimate was also formed of the value of the whole property, public and private, which has been created and accumulated by the people of this country, and which they now actually possess. This value, when the sum is expressed by figures, is so immense, that it eludes the imagination to conceive it.

Value of productive private property, -	£2,995,000,000
... unproductive, or dead stock, - -	540,700,000
... public property of all kinds, - -	103,300,000
Total public and private property, - -	£3,679,000,000

The wealth of the empire is distributed in the following proportions between the three countries:

	Productive private property.	Unproductive private property.	Public property.
England, -	£2,054,600,000	£374,300,000	£42,000,000
Scotland, - -	316,100,000	51,100,000	3,000,000
Ireland, - -	622,100,000	116,400,000	11,900,000

The proportion which these values bear to the population in each country is not suggested by the table; but in England (taking productive and unproductive property together) the ratio is £186 to each person; in Scotland, £160; and in Ireland, £96.

The following is the latest statement of the extent and population of the empire:—

*The annual consumption of all kinds of grain in the United Kingdom was, a few years ago, estimated at 52,000,000 quarters, about a twelfth part of which would require to be imported. All ordinary kinds of animal food, or foreign produce, are entirely excluded.

	Population.	Sq. Miles.
British Islands,	24,371,758	90,948
British dependencies in Europe,	247,701	
North America, Canada, &c.	1,066,208	1,930,000
West Indies,	884,050	
Australian Colonies,	39,685	1,406,000
Islands of Ceylon and Mauritius,	1,034,736	21,000
British possessions in Africa,	154,046	91,000
East India Empire,	89,577,206	826,650
Total,	117,375,390	4,457,598

Since the preceding details were collected, the returns of the census of Great Britain for 1841 have been published. It appears from these, that on the night of the 6th of June, 1841, the population was as follows:—

England,	14,995,508
Wales,	911,321
Persons travelling on railways and canals,	4,896
	15,911,725
Scotland,	2,628,957
Man, Jersey, and other islands in British Seas,	124,079
Total of Great Britain,	18,664,761

If to this we add 8,205,382 for Ireland, which, however, we have only on newspaper authority, the total population of the United Kingdom, on the night of June 6, was 26,870,143. The returns include only such part of the army, navy, and merchant seamen, as were at the time of the census within the kingdom on shore.

The increase of the population, as compared with the returns of 1831, is at the rate of 14·5 per cent. for England; 13 per cent. for Wales; for Scotland, 11·1; for the islands in the British Seas, 19·6: making the increase for the whole of Great Britain 14 per cent., being less than that of the ten years ending 1831, which was 15 per cent.

The number of houses in England is—Inhabited, 2,753,295; uninhabited, 162,756; building, 25,882. The number in Wales, inhabited, 188,196; uninhabited, 10,133; building, 1,769. In Scotland, inhabited, 503,357; uninhabited, 24,307; building, 2,760. In the islands of the British Seas, 19,159 inhabited; 865 uninhabited; and 220 building. Grand totals for the whole of Great Britain, 3,464,007 inhabited, 198,061 uninhabited, 30,631 building—altogether, 3,692,679 houses.

DESCRIPTION OF ENGLAND.

The ancient kingdom of England, inclusive of Wales, forming geographically the principal division of the island of Great Britain, and politically the chief division of the United Kingdom—the country in which, it is no boast to say, the arts and institutions of social life have made the greatest advance they have ever done in any part of the world—enjoys a situation which has unquestionably tended much to make the country what it is, both politically and socially. The island of which it is the southern and larger portion, is protected from neighbouring countries by a sea of sufficient breadth in most parts, and sufficiently uncertain in its condition, to throw almost insuperable difficulty in the way of an invading force. Placed in a medium latitude, it is further saved by the surrounding ocean from those extremes of heat, cold, and aridity, to which continental countries in both higher and lower parallels are often subject. While there are some districts, chiefly in the west and north, in which an uneven surface prevails, the country may be generally described as of a level and fertile character. Almost everywhere, the eye rests upon the evidences of a long-enduring cultivation, in rich corn-fields and meadows, surrounded by well-grown hedges and rows of trees; the elm-surrounded Gothic parish church, the clean honey-suckled village, and the well-wooded park connected with the residence of the noble and gentleman, being other notable features in the landscape. When we turn from merely rural scenes, we see not less striking evidences of an advanced civilization, in frequent brick towns and "towered cities," generally overhung by clouds of smoke resulting from the coal everywhere used for domestic, if not also for manufacturing purposes. The peculiar features of some of these cities—Liverpool, Hull, and Bristol, vast depôts of mercantile shipping; Manchester and Birmingham, sites of extensive manufactures; London, in itself a superb port, the seat of the government and the residence of a class of unprecedented wealth and splendour—will be more particularly adverted to in the sequel.

England is situated between 50° and 55° 45′ north latitude, and 6° west and 1° 50′ east longitude, from Greenwich Observatory. On the north, the only direction in which it is not surrounded by the sea, it is divided from Scotland by a series of rivers and a chain of mountains. The greatest length, from Lizard Point in Cornwall to Berwick-upon-Tweed, is 400 miles; and the greatest breadth, from St. David's Head in Pembrokeshire to the east of Essex, is 300 miles. The area has been variously estimated at 50,387 and 57,960 square miles; it has also been estimated at 37,784,400 acres, of which only about a fourth part is said to be uncultivated.

England is divided into fifty-two counties, forty of which form England Proper, while twelve belong to Wales. They may be thus enumerated:—*Southern Counties*—Cornwall, Devon, Somerset, Dorset, Wilts,

Hampshire, Berkshire, Sussex, Surrey, and Kent. *Midland Southern Counties*—Middlesex, Hertfordshire, Bedfordshire, Buckinghamshire, Oxfordshire, Gloucestershire, Cambridgeshire, Huntingdonshire, Northamptonshire, Warwickshire, and Worcestershire. *Midland Northern Counties*—Rutlandshire, Leicestershire, Staffordshire, Nottinghamshire, and Derbyshire. *Eastern Counties*—Essex, Suffolk, Norfolk, and Lincolnshire. *Counties bordering on Wales*—Monmouth, Herefordshire, Shropshire, and Cheshire. *Northern Counties*—Lancashire, Westmoreland, Cumberland, York, Durham, and Northumberland. *Counties in South Wales*—Glamorganshire, Brecknockshire, Caermarthenshire, Pembrokeshire, Cardiganshire, and Radnorshire. *Counties in North Wales*—Montgomeryshire, Merionethshire, Flintshire, Denbighshire, Caernarvonshire, and Anglesea. The capital city is LONDON, which is also the metropolis of the United Kingdom. The counties are subdivided into hundreds, wapentakes, tithings, &c., the whole containing 25 cities (inclusive of London), and 172 boroughs. For ecclesiastical purposes, the country is divided into 11,077 parishes; the largest number in any county being 475, in Somersetshire, and the smallest 32, in the county of Westmoreland.

Owing to the limited extent and insular position of England, it contains no rivers comparable in magnitude to those of various continental countries. There are, nevertheless, some fine navigable streams, as the Thames, Medway, Humber, and Tyne, on the east side of the island, and the Mersey and Severn on the west side. The Trent, Ouse, Tees, Wear, Dee, Avon, and Derwent, are minor, but not inconsiderable rivers, besides which there are many of inferior importance. England contains no large lakes; but those of Cumberland, Westmoreland, and Lancashire, though of small size, are celebrated for the picturesque scenery by which they are surrounded.

Wales and the west side of England generally are mountainous. The chief ranges of mountains in this district have been classed under three heads—the *Devonian Range*, stretching from Somersetshire, through Devon, into Cornwall, and terminating with the promontory of the Land's End; the *Cambrian Range*, extending from the Bristol Channel through Wales; and the *Northern* or *Cumbrian Range*, stretching from Derbyshire, through Cumberland, and passing into Scotland. None of the individual hills exceed 3000 feet in height, except a few in Wales; the highest being Snowdon in Caernarvonshire (3571 feet). In the central and eastern parts of England (south of Yorkshire), there are a few ill-defined ranges of swelling eminences, but none which reach the altitude of 1000 feet. Besides Snowdon, the principal eminences in England are David (3427 feet), and Llewellen (3469), both in Wales; Skafell (3166), Skiddaw (3022), and Saddleback (2787), in Cumberland; and Helvellyn (3055), in Westmoreland. The loftiest points in the Devonian range are not more than from 1000 to 1200 feet in height.

GEOLOGICAL STRUCTURE.—SOIL.—CLIMATE.

The surface of England includes specimens of the whole extent of the series of rocks, from the primary, which are found in the ranges of mountains on the west, to the lowest of the tertiary, which compose several districts in the south-east; strata intermediate to these divisions being found in succession, in proceeding from the west and north towards the east and south.

In Cornwall and Devonshire, eminences of granite, serpentine, and felspar porphyry, occur, while the slopes resting on them are composed of different kinds of slate. The granite of this district is extensively used for paving in London, though considered less hard and durable than that brought from Scotland. The Welsh mountains are composed chiefly of varieties of slate, with some intermixture of volcanic rocks, as basalt and trap; while a rich coal-field, one hundred miles in length and from five to ten in breadth, rests upon their southern verge, extending from Glamorgan into Pembrokeshire, being the largest coal-field in Great Britain. The northern range of mountains is also chiefly composed of slate rocks, there being only one mountain of granite near Shap in Westmoreland.

Between these ranges of mountains and a line drawn from Exmouth, through Bath, Gloucester, Leicester, Nottingham, and Tadcaster, to Stockton-upon-Tees, the surface is composed of the lower secondary strata, including rich beds of coal, the existence of which in this situation is mainly what has enabled England to become the first manufacturing country in the world. The eastern parts of the counties of Durham and Northumberland, from the Tees northward to Berwick, form a peculiarly valuable coal-field, of numerous beds, from which the metropolis and other cities in the east of England and elsewhere are supplied with this important mineral. Another coal-field of great value, and that upon which the manufactures of Manchester depend, extends northwards from Macclesfield to Oldham, and thence westwards to Prescot near Liverpool. A coal-field near Wolverhampton, in Staffordshire, is the most valuable in the centre of England: upon it depend the extensive metallic manufactures of Birmingham.

To the east of the line drawn from Exmouth to Bath and thence by Gloucester, Leicester, and Tadcaster, to Stockton-upon-Tees, we find the upper rocks of the secondary formation, presenting in succession red sandstone and red marl, lias limestone and clay, oolitic limestone, green sand with clay, and finally chalk. Connected with the red marl, great strata of rock-salt are found; these are extensively dug in Cheshire and Worcestershire for domestic use. Lias, which extends from Lyme in Dorsetshire to Whitby in Yorkshire, is remarkable for the remains which it presents of the large saurian reptiles. Beds of oolite limestone, so called from the small egg-like globules contained in it, cover the southern part of Gloucestershire, and a great part of Oxfordshire, Northamptonshire, Rutlandshire, and the eastern side of Lincolnshire. The Portland stone, so extensively used for building, and which is quarried in the Isle of Portland, belongs to this class of rocks. The chalk exists everywhere to the south-east of a line commencing near Dorchester on the south coast, and passing through Wilts, Berks, Norfolk, and so on to Flamborough Head—excepting in Sussex and Kent, where it has been carried off by denudation, exposing a peculiar formation called the *wealden*, and in the bed of the Thames near London, and one or two other places, where tertiary beds of clay occur.

Tin-ore, containing about three parts metal out of four, is found in thick veins or vertical beds in the granite of Cornwall, where it has been wrought since before the conquest of the country by the Romans. Copper-ore is also found extensively in that district, generally in continuation of veins, which, in the upper parts, have been composed of tin-ore; and in several of the same veins, lead, zinc, and antimony are found. A mountain of copper-ore, named Parys Mountain, has long been wrought in the Isle of Anglesea, but is now supposed to be nearly exhausted. Next in importance to coal, as a mineral product, is iron, which is extensively diffused throughout England, though chiefly wrought in the neighbourhood of coal, on account of that fuel being required for smelting it. In 1839, this valuable metal was produced in South Wales to the amount of 380,000 tons. The chief other districts where it is wrought are Staffordshire, Worcestershire, and Yorkshire; the entire produce in that year being a million of tons. In an account of the mineral productions of England, it would be improper to overlook its clay, so extensively used in

the manufacture of pottery (chiefly in Staffordshire), and in making bricks and tiles for building.

The great south-east division of England, in which a comparatively level surface prevails, exhibits a soil which is either chiefly chalky, or chiefly clayey, according to the character of the substratum. Interspersed are a few sandy tracts, of which Bagshot Heath may be cited as an example. In the mountainous districts, the usual light soil resulting from the early rocks prevails, excepting where, in the north, there has been a peaty admixture. Upon the whole, England may be said to possess a large proportion of good and productive soil. Probably not above one-ninth of the entire surface (Wales being included) is unsoceptible of tillage.

The climate of England is, as already mentioned, remarkable for its exemption from extremes of heat and cold. It displays an uncommon amount of variation within a narrow range. The average temperature in winter is about 42° of Fahrenheit; in summer, the day temperature is generally about 62°. It is only on rare occasions that the thermometer reaches 80°, or sinks below 20°. The neighbourhood of the sea, which partly accounts for this moderation, is also the cause why the climate of England is more humid than is usual in continental countries of similar latitude. Being inclined to cold and damp, it is more favourable to the growth than to the ripening of vegetable productions. It is certainly not unfavourable to either the physical or moral condition of the people. Perhaps even its uncertainty has been the subject of too much grumbling. On this point we may adduce the cheerful opinion of Charles II., as recorded by Sir William Temple. "I must needs," says Sir William, "add one thing more in favour of our climate, which I heard the king say, and I thought new and right, and truly like a king of England that loved and esteemed his own country: it was in reply to some of the company that were reviling our climate, and extolling those of Italy and Spain, or at least of France. He said he thought that was the best climate where he could be abroad in the air with pleasure, or at least without trouble and inconvenience, the most days of the year, and the most hours of the day; and *this he thought he could be in England more than in any other country in Europe.*" Devonshire and some adjacent districts on the southern coast enjoy a temperature which in winter is, at an average, two, three, four, and even in some instances five degrees above the rest; and these districts are therefore recommended for the residence of persons affected by pulmonary disease.

VEGETABLE PRODUCTIONS.—ANIMALS.

The most conspicuous feature in the botany of England is the fresh and luxuriant herbage, resulting from the humidity of the climate, and which, though apt to be overlooked by the natives from familiarity, never fails to strike the minds of foreigners with surprise.

Much of the surface was formerly under wood; but this has for ages been chiefly confined to particular forests, to the neighbourhood of great mansions, and the enclosures of fields. Several large royal forests still exist in England, the most considerable being New Forest in Hampshire (66,942 acres), and Dean Forest in Gloucestershire (23,015 acres). That of Windsor, though famed from its situation and the poetry of Pope, is much smaller, being only 4402 acres. These were anciently the scenes of courtly sport, but are now in part reduced to cultivation, or reserved for the production of timber to be used for the public service. The *parks* around the seats of the nobility and gentry are a peculiar and most inviting feature of the English landscape. A mixture of green open glades with masses of old well-grown timber, they are scenes of great sylvan beauty; while the existence of so much pleasure-reserved ground in a country where nearly every acre would be profitable under tillage, conveys a strong impression of the opulence of England. The principal trees are the oak, elm, beech, ash, chestnut, sycamore, poplar, and willow. The vine was at one time extensively cultivated in southern England, but is now seen only in a few detached places.

The leading grain in England is wheat; barley, oats, and rye, being in a great measure local to the less favoured districts. The turnip and potato are almost everywhere cultivated; and peas, beans, and clover, are extensively diffused. Hops are produced in the counties of Surrey, Worcester, and Hereford. Hemp, flax, and some other useful productions of the soil, are less conspicuous. The principal fruit-trees are the apple, pear, cherry, and plum; but many others are cultivated under particularly careful circumstances. The English garden produces a great variety of pot-herbs, most of which have been introduced from the continent within the last three centuries.

Of the useful animals, England possesses a considerable variety. Her draught-horses are remarkable for their bulk, generally fine condition, and great strength. The race and riding-horse have been improved by the best blood of Arabia and Barbary. There are excellent breeds of both sheep and cattle; and the pig is also an animal in prime condition, and extensively reared. Some of the ancient wild animals, as the wolf, boar, and beaver, are now extinct; and other, as the stag and wild-ox, are very rare. The hare, partridge, and pheasant, are the chief game animals, grouse being only found, and that in small amount, in some of the northern wolds. Most of the smaller quadrupeds, birds, insects, &c., common in the same latitude, are found in England. The nightingale is said to be not heard farther north than Yorkshire. The rivers present trout, perch, &c., and the adjacent seas abound in herring, mackerel, sole, pilchard, and other edible fishes.

Agriculture is, in England, in a progressive state but is yet not nearly so far advanced as in the better parts of Scotland. Previous to the eighteenth century, no advance had been made from the most simple modes of tillage and husbandry. The chief improvements since then are thus enumerated in a popular work:—"The gradual introduction of a better system of rotation, since the publication of Tull's *Horseheeing Husbandry*, and other agricultural works, from 1700 to 1750; the improvement of live-stock, commenced by Bakewell about 1760; the raised-drill system of growing turnips, the use of lime, and the convertible husbandry, by Pringle, and more especially by Dawson, about 1765; the improved swing-plough, by Small, about 1790, and the improved threshing-machine, by Mickle, about 1795. The field culture of the potato, shortly after 1750; the introduction of the Swedish turnip, about 1790; of spring wheat, about 1795; of summer wheat, about 1800; and of mangel-wurzel more recently, have, with the introduction of other improved field-plants and improved breeds of animals, contributed to increase the products of agriculture; as the enclosing of common field lands and wastes, and the improvements of mosses and marshes, have contributed to increase the produce and salubrity of the general surface of the country."

Mr. M'Culloch calculates that twelve millions of acres are cultivated in England as follows:—

	Acres
Wheat,	3,800,000
Barley and rye,	900,000
Oats and beans,	3,000,000
Clover,	1,200,000
Roots (turnips, potatoes, &c.),	1,300,000
Hops and garden products,	150,000
Fallow,	1,650,000
	12,000,000

The value of the crops is estimated by the same writer

at £72,000,000. He also calculates 17,000,000 acres of pasture-land as producing £69,000,000.

The chief defects of the agricultural system of England are in the modes of tillage. Cumbrous machinery is employed to do what might be better done by a lighter and cheaper kind: thus, five horses, and even more, are sometimes seen at one plough, while the heaviest lands in Scotland require only two. The virtue of draining is scarcely dreamt of in many districts of England, while in Scotland it is in some places doubling the produce, besides improving the salubrity of the climate. English farmers are too little educated to be ready to adopt improved modes of agriculture; and, amongst the class of landlords, these have hitherto been too much overlooked.* It seems surprising, yet is quite true, that in one district of the island of Great Britain, expensive and unproductive modes, scarcely in the least better than those which prevailed during the wars of the Roses, will be followed, without the least suspicion that they are wrong, although other districts, which might be reached by a day's journey, present appearances of a reflecting skill and dexterity, the general diffusion of which would be attended with incalculable benefit to both landlords and tenants. It is gratifying, however, to know that this state of things is not likely to last much longer. The English nobility and gentry are now supporting an agricultural association, which is to proceed after the manner of the eminently useful Highland Society of Scotland, in promoting improvements in this important branch of the national industry. We may therefore hope, in another generation, to see the splendid soil of England turned to its full account.

THE PEOPLE—THEIR CHARACTER.

The constituent elements of the English population are to be traced in the history of the country. The first inhabitants were Britons, probably a mixed Celtic race, and who, during the time of the possession of the country by the Romans, must have been slightly changed by the admixture of that race. Upon a scattered population of Romanized Britons came the great wave of the Saxon invasion, in the fifth and sixth centuries. The Britons are usually said to have been driven to the west; but probably this was not so much the case as has been generally thought, for it is rarely that any invasion expels the mass of a people from the ground they have long occupied. After this, however, the predominant element of English society was undoubtedly Saxon, the Norman conquest only adding to it a French aristocracy, which little affected the great bulk of the population. The English, therefore, exclusive of the Welsh, who are Britons almost unchanged, may be regarded as in the main a Teutonic people, an admixture of British or Celtic entering into the composition always in less and less measure as we advance from Wales towards the eastern coasts, where the people are nearly pure Saxon.

According to an acute writer, "the Saxon Englishman is distinguished from other races by a stature rather low, owing chiefly to the neck and limbs being short, by the trunk and vital system being large, and the complexion, irides,† and hair light; and by the face being broad, the forehead large, and the upper and back part of the head round, and rather small. In his walk, the Englishman [understanding by this name the Saxon Englishman] rolls, as it were, on his centre. This is caused by the breadth of the trunk, and the comparative weakness of the limbs. The broader muscles, therefore, of the former, aid progression by a sort of rolling motion, throwing forward first one side and then another. . . . The mental faculties of the Englishman are not absolutely of the highest order; but the absence of passion gives them relatively a great increase, and leaves a mental character equally remarkable for its simplicity and its practical worth. The most striking of those points in English character, which may be called fundamental, are *cool observation, unparalleled single-mindedness*, and *patient perseverance*. This character is remarkably homogeneous.

"The cool observation of the Englishman is the foundation of some other subordinate, but yet important points in his character. One of the most remarkable of these, is that real curiosity, but absence of wonder, which makes the *nil admirari* a maxim of English society. It is greatly associated, also, with that reserve for which the English are not less remarkable.

"The single-mindedness of the Englishman is the foundation of that sincerity and bluntness which are perhaps his chief characteristics; which fit him so well for the business of life, and on which his commercial character depends; which make him hate (if he can hate any thing) all crookedness of procedure, and which alarm him even at the insincerities and compliances of politeness.

"The perseverance of the Englishman is the foundation of that habitude which guides so many of his own actions, and that custom in which he participates with all his neighbours. It is this which makes universal cant, as it has been profanely termed,* not reasoning, the basis of his morals; and precedent, not justice, the basis of his jurisprudence. But it is this also which, when his rights are outraged, produces that grumbling which, when distinctly heard, effectually protects them, and it is this which creates that public spirit, to which on great emergencies, he rises with all his fellow-countrymen, and in which he persists until its results astonish even the nations around him.

"Now, a little reflection will show, that of the three fundamental qualities I have mentioned, the first seeming may easily be less amiable than the final result shall be useful. To a stranger of differently constructed mind, the cold observation, and, in particular, the slowness and reserve which must accompany it, may seem unsociable; but they are inseparable from such a construction of mind, and they indicate not pride, but that respect for his feelings which the possessor thinks them entitled to, and which he would not violate in others. The dignity, therefore, which in this case the Englishman feels, is not *hauteur*; and he is as rarely insolent to those who are below, as timid to those who are above him.

"In regard to the absence of passion from the English mind, it is this which forbids one to be charmed with music, to laugh at comedy, to cry at tragedy, to show any symptom of joy or sorrow in the accidents of real life; which has no accurate notion of grief or wretchedness, and cannot attach any sort of meaning to the word ecstacy; and which, for all these reasons, has a perfect perception of whatever is ridiculous. Hence it is, that in his domestic, his social, and his public relations, it is perhaps less affection than duty that guides the conduct of an Englishman; and, if any one question the moral grandeur which this sentiment may attain, let him call to mind the example of it, which, just before the victory of Trafalgar, was given by Nelson in the simple and sublime communication to his fleet—'England expects every man to do his *duty!*' Which is the instance that equals this even in the forged records of Roman glory? Happily, too, the excess of hatred is as little known

* We have been assured that, in some districts, where the stranger is surprised to see the flail still in operation, the farmers and landlords are not unaware of the superiority of the thrashing-machine; but, having only the alternative of supporting the labouring class by this means, or in the condition of paupers, they prefer the former. It is needless to remark, that this is only a misapplication of the powers of the labouring class, which can only tend to increase poverty, and which we may hope to see in time abandoned.

† Plural of iris, the coloured part of the eye, surrounding the pupil.

* The word must not here be understood as implying hypocrisy, of which the Saxon temperament is very innocent.

the Englishman as excess of love; and revenge is abhorrent to his nature. Even in the pugiliatic combat he shakes hands with his antagonist before he begins; he scorns to strike him when he is down; and, whether vanquished or victor, he leaves his antagonist neither cast down nor triumphant.

"The extraordinary value of such a character is obvious enough. British liberty and British commerce are its results: neither the Scottish nor Irish mind would have attained them."*

In this sketch, though clever and forcible, some conspicuous features of the social character of the English are overlooked. The domesticity of the Englishman's mode of life is very remarkable, when taken in contrast with the lounging, open-air existence of continental nations. The Englishman delights in his home, and spends much of his time in it—a result to which the nature of the climate undoubtedly contributes. He appreciates his home very highly, calls his house his castle, and prides himself on its being inviolable even by the emissaries of the law. The members of his family, his wife, his sons and daughters, are taken along by him in most of his recreations and pleasures. The conjugal tie is deemed peculiarly sacred, insomuch that the slightest dishonour offered to it is universally resented. It cannot be said, however, that the affections of kindred are much recognised in England beyond the nearest class of relations.

The strong sense of rectitude which animates the Englishman is conspicuous in his love of what he calls *fair play*, which he carries even into those coarse amusements, boxing, cock-fighting, dog-fighting, &c., a love of which (now fast declining) forms one of the less amiable traits of the national character. His benevolence shines in the liberality of the legal provision for the poor, and in the numberless charitable institutions of all kinds which are supported in the country, as well as in the readiness which the nation has always displayed to hold out a hand of succour to distress in other quarters of the world. Cleanliness of person and household, and a love of comfort both in food and in domestic accommodation, distinguish the people at large. In all personal and domestic circumstances, the substantial is kept strongly in view, even while the ostensible object is ornament. The aristocratic institutions of the country have mixed, with the sturdy independence of the English character, a considerable reverence for external and accidental distinctions, and created a disposition, pervading almost all classes, to hold forth appearances rather above than below their means. For the same reason, as well as that abstract truths are not readily apprehended by the English intellect, there is a strong and general disposition to cling to ancient practices and forms in both government and law. The rural tenantry and the tradesmen of the smaller towns are generally subservient to the landed classes; and it is chiefly in large towns that new political dogmas find any warm advocacy.

Horse-racing and field-sports are the chief amusements of the nobility and gentry, and are practised upon a scale so extensive, and with apparatus so perfect in all its parts, including a breed of horses of the highest excellence, that they would probably be considered by a foreigner as amongst the most remarkable features of English life. Amongst the upper and middle classes generally, the pleasures of the table are much, perhaps too much, cultivated; dinner, in particular, being generally followed by an abundance of the wines of Portugal, Madeira, and Germany. The lower classes also live, in general, on substantial fare; their favourite beverages are ale and porter; while quoits, cricket, and ninepins, may be described as their most common amusements.

* Blackwood's Magazine, 1829.

PROGRESS OF POPULATION.—HEALTH AND LONGEVITY.

The population of England in the time of the Plantagenet sovereigns, is believed to have been little more than two millions. It has been estimated at 5,500,000 in 1696. The progress during the greater part of the eighteenth century was slow; the amount in 1760 is supposed to have been about 6,500,000. In 1801, for the first time, a regular census was taken; and this has been repeated once in ten years ever since, giving the following results:—

1801,	-	8,872,980	1821,	-	11,978,875
1811,	-	10,150,015	1831,	-	13,894,569

The census to be taken during he year in which this sheet is published, will probably give not less than 16,000,000, being nearly a doubling since the beginning of the present century. The rapid advance of our population is placed in a striking light, when we consider that, for the United Kingdom, it is nearly a thousand per day. Within the last ten years, emigration has been proceeding on a scale of unprecedented magnitude; yet, even in the years during which it has been most active, it has not been sufficient to drain the country at one-third of the rate at which its population has been increased by new births. This rapid increase of numbers clearly shows that, whatever partial evils there may be in the condition of the people, the country must upon the whole have enjoyed for forty years a high degree of prosperity; for it is quite insupposable that, with stationary resources, so many new mouths could have been fed, unless there had been, what certainly there has *not* been, a large and general deterioration in the style of living. It is to be remarked, however, that an immigration to a great extent from Ireland has been going on for about twenty years, and that generally the Irish settlers continue in England to live in a style little superior to that which they followed in their own country.

The increased population has chiefly taken place in the manufacturing towns. It was calculated by Mr. M'Culloch, in 1831, that nearly a third of the people live in towns of above 10,000 inhabitants. Most of the large cities have experienced a rapid advance of population within the last twenty years. These circumstances serve to show that it is the development of the manufacturing, and not of the agricultural energies of the country, which has mainly tended to increase the population. In 1831, it was ascertained that the total number of persons, above twenty years of age, engaged in any kind of business or professional employment, was 3,394,690. Of these, 1,075,912 were engaged in agriculture; 1,327,727 in trade and manufactures; and 991,051 in other pursuits. Of the last number, 185,187 were capitalists, bankers, and professional and other educated men. In this part of the account we also find the army and navy, and male servants. "It may thus be seen," says an intelligent writer, "how very small is the number of persons arrived at maturity, who are not employed in some one or other of the occupations whereby the sum of the national wealth or convenience is advanced."

With regard to the rate of mortality in England, no certain conclusions were in the hands of the public till the commencement of a general registry of births, marriages, and deaths, in 1836–7. In the first year of the operation of this system, the burials were 335,956, which, if we suppose the population to have then been fifteen millions and a half, would give 1 in 46 per annum as the rate of mortality for the whole country, being considerably more than previous imperfect calculations had made it. There are considerable local variations in the rate of mortality, in accordance with peculiar circumstances. In the last half of the year 1837, the deaths out of 3,553,161 persons, living in large cities, were 47,953; and out of 3,500,751 persons living chiefly in rural situations, only 34,074, or as nearly 34 to 47 For

this so much greater mortality in cities, we must look, first to that custom which prevails of retiring in old age and sickness from country to town, and, secondly, to the filth, deficient ventilation, destitution, and vicious habits of life, which prevail in large towns. It is remarkable that London is healthier than most of the other large towns. The proportion who died at 70 out of 1000 persons, was in London 104; but in Birmingham it was 81, in Leeds 79, and in Liverpool and Manchester only 63.

Out of 1000 deaths in the counties of Dorset, Devon, and Wilts, and in Wales, 180 are of children under one year; but in Leeds and its neighbourhood, in the mining districts of Staffordshire and Shropshire, and in the fenny lowlands of Lincoln, Cambridge, and Huntingdonshire, the number was 270, giving token of a great local discrepancy in the sanitory condition of the English population. After deducting the diseases of infancy, the most fatal maladies in England are consumption, fever, and dysentery. One-eighth of the whole deaths, subject to the above deductions, are ascribed to the first of these diseases.

REMARKABLE NATURAL SCENERY—NATURAL CURIOSITIES.

The natural scenery of England is generally of a pleasing rather than a grand or picturesque character; yet there are some portions of the country which are considered attractive on account of their romantic beauty. We shall notice the chief of these.

The Cumberland Lake Scenery.—The south-west part of the county of Cumberland and the north-west part of Westmoreland, comprehend a range of lofty mountains—Skiddaw, Saddleback, Helvellyn, and some others of scarcely less note—amidst which lie the lakes for which this district of England has long been celebrated. The largest of these are Ullswater, Thirlmere, Derwentwater, and Bassenthwaite; but some of less size, as Buttermere, Crummockwater, Loweswater, Ennerdale, Wastwater, and Devock-lake, are scarcely less admired. The vales or passes amongst the hills likewise contain much beautiful scenery of a wild character, although perhaps only traversed by a brawling mountain rill.

The combination of alpine wildness and grandeur, with the soft scenery which reposes in clothed slope and mirror-like lake at the bottoms of the hills, is what gives the Cumberland scenery its principal charm. Ullswater, which extends into Westmoreland, is thought to possess the greatest beauty: it is about nine miles in length, but nowhere more than one in breadth. Derwentwater (often termed Keswick Lake, from its vicinity to the town of Keswick), which measures three miles in length by one

Derwentwater or Keswick Lake.

and a half in breadth, is only inferior to Ullswater. Mrs. Radcliffe, the eminent novelist, describes it as having peculiar charms, both from beauty and wildness. "The whole is seen at one glance, expanding within an amphitheatre of mountains, rocky but not vast, broken into many fantastic shapes. The precipices seldom overhang the water, but are ranged at some distance; and the shores swell with woody eminences, or sink into green pastoral margins. The bosom of the lake is spotted by several small but well-wooded islands."

Amongst the *passes*, that of Borrowdale is the most remarkable: It is a narrow chasm opening from the centre of the amphitheatre which terminates the expanse of Derwentwater, and traversed by the vehement little stream of the same name. Near the entrance of the pass is a detached mountain called Castle-Crag, with a peaceful village reposing at its foot; and opposite to Castle-Crag is the *Bowderstone*, a huge mass of rock, which has apparently fallen from the neighbouring cliffs, and round whose base the road is made to wind. It is computed that this enormous boulder is not less than 1800 tons in weight.

The lake scenery of Cumberland has by its beauty attracted a great number of permanent residents, whose villas enter pleasingly into its landscapes, and amongst whom the present age has seen several eminent literary men—Southey, Wordsworth, &c. It also attracts an immense number of tourists from all parts of the kingdom.

The district usually called *the Lakes* may be said also to comprehend a small northern and nearly detached portion of Lancashire, where Windermere and Coniston Water are sheets rivalling in extent and beauty those of Cumberland.

The Derbyshire Peak Scenery.—The termination of the great northern range in the north of Derbyshire, presents, in that district, a collection of rugged hills and narrow valleys, amidst which some of the most romantic scenery in England is to be found. A particular portion of it, near the village of Castleton, is termed the Peak Scenery, from a particular eminence or peak which attracts more than usual attention.

The *Peak* is approached through a rude and savage pass, named *Winyats* (*q. d.* gates of the winds), flanked with precipices 1000 feet high. It is a limestone mountain, and perforated, as mountains of that kind of rock often are, with an immense cave. On the top are perched the remains of a castle, once the residence of a family descended from William Peveril, a natural son of the Conqueror. In the precipice below, above 600 feet from the top, is the entrance of the cave, a flattish Gothic arch,

Entrance to the Peak Cavern.

120 feet wide and 46 in height. Within this arch the cavern recedes about 90 feet. Here a company of twine-makers pursue their humble trade. At the extremity of the first cave, which alone enjoys any of the light of day, a low and narrow arch leads into a spacious opening, called "the Bell-house," whence a path leads to the "First Water." This is a lake 42 feet in breadth, passing below a massive arch of rocks, in some places not more than 20 inches above the surface of the water. Laying himself flat along the bottom of a small canoe, the visiter with his guide shoots through below the depending rocks into an opening 220 feet in length, 200 in breadth, and 121 in height. At the further extremity of this spacious cavern, the stream which flows along the

bottom forms itself into what is called "the Second Water," near the end of which is a pile of rocks subjected to a perpetual copious dripping from the roof, and called "Roger Rain's House." Other passages and expansions succeed, till the cave ceases to be passable at the distance of 2300 feet from the opening. On returning from his torch-lit adventure to the mouth of the cave, the visiter usually experiences a singular impression of novelty and delight from beholding again the surface of the daylight world.

The scenery adjacent to the neighbouring town of Buxton is also much celebrated. One of the most noted objects is *Elden's Hole*, a perpendicular opening, down which a line has been dropped to the extent of 2652 feet without finding the bottom. *Poole's Hole* is a cave remarkable for its magnificent stalactites. A succession of beautiful valleys, situated amidst rugged mountains, leads to the romantic one of *Matlock*, where the banks of the Derwent are bordered by extensive woods, interspersed with the boldest and most varied forms of rock. Of a wilder character is the celebrated *Dovedale*, where the River Dove traverses a pass of two miles in length, and of the most striking character. The sides of this short valley are chiefly composed of rocks of gray limestone, which, in their abrupt and towering ascent, assume innumerable fantastic forms—spires, pyramids, &c.—and are clothed with yew-trees, the mountain-ash, and numerous mosses and lichens.

The Isle of Wight.—This island, situated off the coast of Hampshire, and measuring twenty-three miles by about thirteen, is celebrated both for its mild climate and its beautiful scenery. From the high open downs formed by a range of chalk hills in its centre, some delightful views, mingling the bold objects of the coast line with the sail-studded English Channel, are obtained. The south shore is the most noted for its romantic objects, the most remarkable of which is at *Undercliff*. Here a great chalk cliff has at one time been presented to the sea; but, afterwards undermined by the action of the waves, a large portion of it has fallen forward in vast fragments, leaving a new cliff at the distance of about half a mile from the shore. In the interval between the beach and the cliff, the fragments are scattered in confusion, many of them forming eminences of the most picturesque forms, while the intermediate spaces afford room for cottages and villas, and even at one place for a small rising town, nestling amidst the most beautiful shrubbery, natural and artificial. This district, when viewed from the sea, appears a series of gigantic steps rising from the beach towards a great perpendicular wall. The cliff in several places opens in vast ravines, locally termed *chines*, which are usually clothed with a picturesque vegetation, and the most admired of which are those of Shanklin and Blackgang. Newport, the capital, is situated in a beautiful valley in the interior, adjoining the picturesque old castle of Carisbrooke. At the western extremity of the island are the celebrated *Needles*, a cluster of chalk rocks rising like pillars above the waves.

The Scenery of Wales.—Wales has already been described as a mountainous region, the chief peaks of which somewhat exceed 3000 feet in height. It is visited by tourists from all parts of the kingdom, on account of the picturesque scenery with which it abounds, particularly in the northern district, or *North Wales*. Its hollows or vales contain none of those beautiful expanses of water which mix such softness with the grandeur of the Cumbrian scenery, but are traversed by impetuous rivers and torrents, according with the precipitous and savage character of the landscape. The vales of North Wales are deeper and narrower than those of South Wales; these expand in many instances into broad plains, affording scope for the operations of the agriculturist, and for the building of towns and villages.

A range of hills, of which *Snowdon* is the highest (3570 feet), traverses North Wales from south to north, terminating at Beaumaris Bay in the tremendous steep of *Penmanmawr*, whose hanging fragments threaten to bury him who travels by the difficult path which has been formed along its almost perpendicular sides. This hilly district comprehends a few *tarns*, or mountain lakelets, full of delicious fish. The general bleakness is delightfully relieved by the intervening vales, the largest of which is that of Clywd in Denbighshire, twenty miles long by about four or five in breadth, and presenting a brilliant picture of fertility. Among the lesser vales, the most famed for beauty is that of *Llangollen*, "where the Dee, winding through cultivated and pastoral scenes, presents at every step a varying landscape." *Festiniog*, in which a number of streams unite to form a little river, amidst verdant and wooded scenes, is also celebrated by tourists.

Cheese Wring and Logging Stones of Cornwall.—Upon a hill north of Liskeard, the slopes of which are strewed with granite boulders, stands the curious pile called the *Cheese Wring*, composed of five flat round pieces of the same rock, laid one above another, the largest towards the top, so that the whole forms a kind of inverted cone, to the height of fifteen feet. Dr. Macculloch, the eminent geologist, explains the formation of this strange object as solely owing to natural causes. *Logging Stones*, of which there are several in the same county, are in like manner explained. The largest is one situated upon a cliffy promonotory near the Land's End. It is a mass 17 feet in length, of irregular form, and believed to be about 90 tons in weight, resting by a slight protuberance upon the upper surface of the cliff, and so nicely poised, that a push from the hand, or even the force of the wind, causes it to vibrate. It appears that these logging stones are simply prismatic masses of the rock, which have chanced to be left in their present situation after adjoining masses of a similar character had been removed.

ANTIQUITIES.

Perhaps the earliest objects of antiquity in England are the barrows or *tumuli* with which the Britons, like so many other uncivilized nations, were accustomed to cover the remains of the dead. Several specimens of these still exist.

Druidical Remains rank perhaps next in point of antiquity. The most simple of these are *Cromlechs*, of which an unusual number is found in the island of Anglesea, once the chief seat of the Druids, who were the priests of British heathenism. A cromlech consists of a large slab of stone, placed flatwise, or in a sloping position upon two upright ones. It seems to have formed an altar for human sacrifices. *Druidical circles* are more complicated. They usually consist of circles of huge stones placed on end, with in some instances connected lines or rows of similar stones, the whole forming objects at once rude and imposing. It is believed that they were the temples of the Druids. The most remarkable Druidical circle is that of *Abury*, six miles from Marlborough, in Wiltshire: there is an outer circle, 1400 feet in diameter, composed of stones generally about 16 feet in height, with a distance of 27 between every two. There are small concentric circles within the large one, and in the centre of all is a cromlech or altar for human sacrifices, composed of one long flat stone, supported by two upright ones. Two straight avenues of approach, about a mile in length, were composed of similar blocks, and on the outside of the outermost circle there was a *vallum* or bank, the inner slope of which was perhaps a place for spectators. From the encroachments and carelessness of the neighbouring inhabitants during a long course of ages, this curious relic of the British people is much dilapidated. Another Druidical circle of great note is that of *Stonehenge*, upon Salisbury Plain, a district also presenting many tumuli and other vestiges of the Bri

Remains of Stonehenge.

tons. The Stonehenge temple, in its perfection, consisted of 140 stones, arranged in two concentric circles, the outermost 108 feet in diameter, with similar stones laid flatwise along the tops of the upright stones. The blocks which remain are from eighteen to twenty feet high, and about seven feet broad. Within the inner circle are two oval ranges, supposed to have formed the *admytum* or vell, and which consist of stones about thirty feet in height. The remains of this stupendous temple, ruined and shattered as they are, still produce a sensation of awe upon the mind of the beholder.

Roman Remains are now rare and nearly obliterated. The roads formed by this people have in some instances been changed into our present comparatively broad and well-formed ways; in other cases, slight traces of their original pavement, which generally consisted of large stones forming a causeway, are to be found. Between Newcastle and Carlisle are the remains of the two walls built respectively by the Emperors Adrian and Severus, in 120 and 210, to keep out the northern barbarians: the first being a high mound of earth, and the second a rampart of stone, 68½ miles long, running parallel to the first, on the outside. Remains of Roman camps, bridges, villas, baths, &c., also exist in various parts of England. All the towns, the names of which terminate in *chester* or *ceater*, are considered as having been originally Roman stations. Near St. Albans are the remains of the walls which once surrounded the Roman town of *Verulamium*, the site of the town itself having long been subjected to the plough.

Several of the small churches built soon after the introduction of Christianity still exist, and continue to be used as parish churches. The larger churches connected with monastic establishments, and the cathedrals, which were the seats of bishops, took their rise at a later period, chiefly during the twelfth and thirteenth centuries. This was a time when an enthusiasm existed for founding and endowing monasteries and churches. To it we are indebted for many superb minsters, the solemn beauty

Glastonbury Abbey.

of which continues to be a proud possession of our land. Westminster Abbey, York Minster, and the cathedrals of Winchester, Lincoln, Gloucester, Canterbury, Lichfield, and Salisbury, may be instanced as particularly august specimens of the Gothic style in which all ecclesiastical structures were then built. There are also many ruinous remains of the great abbacies of the middle ages: those of Tintern, near Monmouth, Glastonbury, near Wells, and Bury St. Edmund's, are of famed beauty. A kindred class of antique structures exist in what are called *crosses*, which consist generally of an elegant tapering Gothic erection, with a small shrine below, and were in most instances erected to hallow the spot on which the remains of venerated persons rested on their way to the tomb.

Caernarvon Castle.

Of the huge castles built by the Norman nobility and by the sovereigns during the first few centuries after the conquest, many specimens still exist, but few which are not in ruins. The Tower of London, built by the Conqueror himself, is an entire and most superb example of this class of structures. Conway and Caernarvon Castles, which, with several others, were raised to overawe the then independent principality of Wales, are also noble specimens. Others may be found in the north, as Lancaster, Carlisle, Newcastle, and Rnghy. They usually consist of a great square tower, with ronges of lesser towers, and the whole surrounded by thick and lofty walls, beneath which there was generally a moat or wet ditch. Dover Castle, placed on the top of a lofty cliff overlooking the English Channel, and still kept in good order, is a peculiarly interesting specimen of the Norman fortress.

MANSIONS.

England abounds in mansions in various styles, the seats of her nobility and gentry. Some of these reach a high degree of splendour, both in architecture and internal furnishing, not to speak of the delightful sylvan domains by which they are generally surrounded.

A certain class of English mansions may be described as engrafted upon the fortresses of the middle ages, or upon the priories and abbeys disused at the Reformation. *Warwick Castle*, the seat of the Earl of Warwick, situated upon a rock forty feet above the River Avon, and *Alnwick Castle*, in Northumberland, the seat of the Duke of Northumberland, are splendid examples of the first class of edifices. The area of the latter building is divided into three courts, entered through gateways formed in lofty towers. The keep, or citadel, is of vast magnitude, and acquires some peculiar points of architectural beauty from 'fair semicircular towers,' which protect and adorn it on every side." *Newstead Abbey*, in Nottinghamshire, the seat of the late Lord Byron and of his ancestors, may be instanced as a beautiful and impressive example of the domestic mansion founded upon the remains of a monastic building.

There is a class of old mansions which appear to be peculiar to England, and are usually called *Halls*. They date in many instances from the sixteenth century, and may be supposed to have been the favourite form of domestic architecture in the days of the first Tudors. *Haddon Hall*, near Derby, belonging to the Duke of Rutland

is an unusually handsome specimen of the class. They generally present a front, of irregular form, advancing into prominent bows with many windows, and constructed of brick upon a fantastically shaped framework of timber, the exterior of which is left exposed and painted. A variety of angular projections break the line of the roof, and give occasion to much carved wood-work. In the interior there is always a goodly hall of oak, with a diced floor, a huge set of oaken tables, and a spacious fire-place. Mr. Nash has published a beautiful work, containing views and descriptions of the most remarkable of these charming old mansions, so rich in old-world associations.

Another large class of English mansions are of a style which prevailed in the seventeenth century, and which comprehends many substantial as well as decorative features. Elegant fronts of polished stone, with traces of turreting, ornamented square windows, and tall angular chimney-stalks, strike an untechnical spectator as the principal features of this style, usually called Elizabethan. *Holland House*, Kensington, and *Theobalds*, the seat of the celebrated Secretary Cecil, present apt examples.

The houses built in the last century were chiefly in the Grecian style, more or less pure. Some of the productions of Mr. Adam present beautiful examples—for instance, *Keddlestone House*, the residence of Lord Scarsdale, near Derby, the front of which is a line of 360 feet, comprehending a central and two lateral masses connected by low corridors, and universally admired for its classic purity and grace. *Chatsworth*, the seat of the Duke of Devonshire, near Derby, is another magnificent mansion of this class.

Within the last fifty years, houses have been built in various styles, imitative of modes long ago fashionable. The castellated, the Elizabethan, and the Grecian, have all had their admirers. It is also common now-a-days to build houses from the foundation in the manner of those Gothic priories and abbeys which were originally designed for purposes so different.

Eaton Hall, the seat of the Marquis of Westminster, situated near Chester, may be considered as a prime example of the modern Gothic. It comprises, besides other apartments, an entrance-hall, paved with variegated marbles, a music-gallery, adorned with two fine pictures by West, a saloon, decorated with some beautiful specimens of stained glass, and a library. This magnificent mansion is much visited by strangers on account of its architectural beauty, its splendid furniture, and the vast number of interesting objects assembled in it.

CITIES, TOWNS, &c.

It has already been seen that a large part of the population of England is collected in cities and towns of considerable size. Some of these may be classed under the separate heads of manufacturing and commercial towns, while others are either university towns, naval stations, cathedral towns, or towns for summer recreation or the residence of persons in independent circumstances. The cities and towns of England are of great number, and, though often of plain exterior, include an immense amount of wealth. The prevalence of brick in domestic buildings, and of the smoke arising from coal fires, gives a peculiar character to English towns. In all, however, there are numerous churches and other public edifices, and in some there are many streets built of stone.

For an account of the capital of England, which unites the manufacturing, commercial, educational, and leisurely characters in one, we must refer to a separate sheet, following the present.

Manufacturing Towns.

At the head of these stands *Manchester*, the chief seat of the principal manufacture of England—that of cotton. This town is situated on the river Irwell, in the south-east district of Lancashire, at the distance of 182 miles from London. Inclusive of Salford, a separate municipality on the other side of the Irwell, and also comprehending a few connected villages, Manchester contained in 1831 a population of 270,398, now probably increased to 350,000. The ground on which it stands is a perfect level, and, from whatever side it is approached, its crowd of spires, towers, manufactories, and warehouses, appears mingling with the smoke that hangs over it. The older part of the town clusters round the collegiate church, an elegant and spacious structure of the time of Henry VII., or extends in ancient street called Deansgate. The busiest commercial street is Market Street, and the most elegant is Mosley Street. The town contains most of the usual public buildings to be found in one of its size—a town-hall, infirmary, prison, exchange, &c., besides several institutions of a literary and scientific character; and several of these buildings, particularly the two first, are of remarkable elegance. A botanic garden, about a mile from the outskirts of the town, is a great ornament, and forms a most delightful as well as instructive place of recreation. There is also a zoological garden.

The factories of Manchester exceed a hundred and twenty in number: they employ between thirty and forty thousand persons, and steam enginery equal in power to five thousand horses. About four-fifths of the cotton manufacture of the kingdom centres in Lancashire, and of this a large proportion is confined to Manchester. The woollen, linen, and silk trade, particularly the last, and many smaller manufactures, as of hats, pins, umbrellas, &c., are also carried on to a large extent in this town. It may be added, that the making of machinery has of late years become a thriving trade in Manchester.

Manchester is connected with its port, Liverpool, by a railway, and by means of the Irwell and numerous canals, it transports and receives goods to and from other parts of the kingdom. (See article CANALS AND RAILWAYS.)

The above may be considered as an outline of this great seat of manufacturing and commercial industry Fully to describe the bustle of wagons and human beings on its streets, to detail the vast mercantile transactions in which it is engaged, or describe its numerous factories and workshops of various kinds, would require a separate volume. In the way of details, we can only afford room for a description of two or three working establishments, which we find in a neat local volume, entitled *Manchester as it is*:—

"Many of the mills are immense buildings, raised to the height of six, seven, and eight stories, erected at an expense of many thousands of pounds, and filled with machinery costing as many more. The capital sunk in a single mill will sometimes be £50,000, and frequently is as much as £100,000. Some of the mills contain nearly 2000 hands. A visit to one of the largest mills, if an introduction can be procured, is a gratifying treat. The rooms are kept in the most perfect state of cleanliness, and the strictest order and regularity prevail. Every operation is performed by rule, and the subdivision of labour is carried out in the most minute manner. The mills and factories are of various sorts, namely, cotton spinning-mills, silk spinning-mills, woollen spinning-mills and factories, small-ware factories, and power-loom weaving factories.

"Among the cotton mills, one of extraordinary extent, belonging to Messrs. Birley & Co., is situated in the suburb called Chorlton-upon-Medlock. It consists of a group of buildings, upon which, including machinery, several hundred thousand pounds have been sunk. The number of hands employed by this firm is 1600, whose wages annually amount to the sum of £40,000. The amount of moving power is equivalent to the labour of 397 horses. The number of spindles in the mills is

about 80,000. The annual consumption of raw cotton is about 4,000,000 lbs. weight! The annual consumption of coal is 8000 tons. It will perhaps excite surprise in a person unacquainted with the nature of machinery, when informed that the annual consumption of oil, for the purpose of oiling the machinery, is about 5000 gallons; and the consumption of tallow, for the same purpose, 50 cwt. The annual cost of gas is £600. One room alone, belonging to this firm, contains upwards of 600 power-looms. Besides the hands engaged in the cotton department, the following description of mechanics are employed in this mill:—Millwrights, mechanics, joiners, bricklayers, plumbers, painters, moulders, turners, and smiths.

"The establishment in which the fabric is manufactured for waterproof clothing, such as '*Mackintosh Cloaks*,' belongs to Messrs. Birley & Co., and is a part of their concern. The number of hands employed in this business varies from 200 to 600. The immense amount of 250,000 lbs. weight of Indian rubber is annually consumed in the process of manufacture, to dissolve which 100,000 gallons of spirits are employed.

"In the establishments called small-ware mills, of which there are several in Manchester, the articles of cotton, worsted, and silk tapes, are very extensively manufactured. To trace the various processes a piece of tape passes through, and the various employments it affords, before it comes into the market, is a very curious and interesting occupation. Beginning, then, with the first commercial operations—The cotton used in the manufacture of tapes, having been warehoused in Liverpool, is sold on account of the importer, and bought to the order of the manufacturer by cotton brokers. It is conveyed by canal or railway to Manchester; and when delivered at the works of the purchaser, is weighed, assorted, mixed, and spread, with a view to obtain equality in the staple. It is then taken to the willowing-machine to be opened and rendered floculent. Thence it is transferred to the blowing-machine, which cleanses it from dust and makes it feathery. Attached to the blower is a lapping apparatus, by which the cotton is taken up and laid in a continuous fleece upon a roller, in order that it may be conveniently carried to the carding-engine, there to be made into a fleece of the most equable texture possible; thence it is handed to the drawing-frame, where it is blended with the production of all the carding-engines connected with the particular set or system to which it belongs. It is next passed through the slubbing-frame, afterwards through the jack or roving-frame, and then through the throstle or spinning-frame, upon which it is made into yarn or twist. From the throstle, the yarn, if intended for warp, is forwarded to the winding-frame, but if intended for weft, to the reeler; afterwards, that which is wound is delivered to the warper, that which is reeled, to the pin-winder. The weaver next operates upon it, passes it through the loom, rubs up the tape, and consigns it to the taker-in, who examines the fabric, and transfers it to the putter-out, who sends it to the bleacher. When bleached, it is handed to the scraper, whose business it is to take out the creases, and open the tape, by running it under and over iron-scrapers. This having been done, the piece is put through the callender, when it is pressed between hot bowls, and rendered smooth and glossy. It is next taken to the lapping department, where it is neatly folded by young women, after which the maker-up forms the pieces into parcels, containing the required quantity, and places them in a powerful press to make them compact. He next papers them, and sends them to the warehouse for sale.

"Some idea of the extent to which this manufacture is carried on in Manchester, may be formed from the fact, that, at the works of Messrs. Wood and Westheads, upwards of 1,240,000 yards of goods, not exceeding three inches in width, and composed partly or entirely of cotton, linen, silk, or worsted, are woven in *one week* or upwards of 35,227 *miles* in *one year*.

"One of the principal establishments in the department of steam-engine making and engineering, is that belonging to William Fairbairn, Esq., situate in Canal street, Great Ancoats street. To persons unacquainted with the nature of working in iron, an admission into these works affords perhaps the most gratifying spectacle which the town can present of its manufactures in this metal. Consequently, almost every person of distinction visiting the town, contrives to procure an introduction to the proprietor before leaving it. In this establishment the *heaviest* description of machinery is manufactured, including steam-engines, water-wheels, locomotive engines, and mill-gearing. There are from 550 to 600 hands employed in the various departments; and a walk through the extensive premises, in which this great number of men are busily at work, affords a specimen of industry, and an example of practical science, which can scarcely be surpassed. In every direction of the works the utmost *system* prevails, and each mechanic appears to have his peculiar description of work assigned, with the utmost economical subdivision of labour. All is activity, yet without confusion. Smiths, strikers, moulders, millwrights, mechanics, boiler-makers, pattern-makers, appear to attend to their respective employments with as much regularity as the working of the machinery they assist to construct.

"In one department mechanics are employed in building those mighty machines which have augmented so immensely the manufacturing interests of Great Britain, namely steam-engines. All sizes and dimensions are frequently under hand, from the diminutive size of 8 horses' power, to the enormous magnitude of 400 horses power. One of this latter size contains the vast amount of 200 tons or upwards of metal, and is worth, in round numbers, from £5000 to £6000.

"The process of casting metal is conducted here on a very large scale. Castings of 12 tons weight are by no means uncommon: the beam of a 300 horses' power steam-engine weighs that amount. Fly-wheels for engines, and water-wheels, though not cast entire, are immense specimens of heavy castings. A fly-wheel, for an engine of 100 horses' power, measures in diameter 26 feet, and weighs about 35 tons. In this establishment some of the largest water-wheels ever manufactured, and the heaviest mill-gearing, have been constructed; one water-wheel, for instance, measuring 62 feet in diameter. The average weekly consumption of metal in these works, in the process of manufacturing, owing to the quantity of wrought-iron used, and the immense bulk of the castings, is 60 tons or upwards, or 3120 tons annually.

"This extensive concern forwards its manufactures to all parts of the world. The stranger is told, on inquiry, that *this* article is for Calcutta, *that* for the West Indies; this for St. Petersburgh, that for New South Wales: and there are, besides, men belonging to it *located* in various parts of Europe, who are employed, under the direction of Mr. Fairbairn, in superintending the erection of work manufactured on these premises."

Leeds, the chief town for the manufacture of cloths, is situated in the West Riding of Yorkshire, on a slope gently rising from the river Aire, at a distance of 191 miles from London. It contains a few streets of handsome houses, but as in many other English manufacturing towns, utility appears to be more in contemplation than ornament or elegance. The population in 1831 was 123,393. There are some goodly public structures, as a court-house, commercial buildings, theatre, &c., and the town enjoys the benefits of a literary and philosophical society, an institution for the promotion of the fine arts, and several public libraries.

Leeds is the centre of a large district devoted to the

mixing of mixed and white cloths. Cloths of light fabrics, and blankets and carpets, are also made here in considerable quantity; but the mixed and white cloths form the staple of the business of the district. The mode in which these are sold in Leeds, gives occasion for the existence of two public buildings of a most peculiar nature. They are called respectively the Mixed Cloth Hall and the White Cloth Hall. A description of the former, from a popular work, will convey an idea of both. "The Mixed Cloth Hall was erected in 1758, at the general expense of the merchants. It is a quadrangular edifice, surrounding a large open area, from which it receives the light abundantly, by a great number of lofty windows; it is 128 yards in length and 66 in breadth, divided in the interior into six departments, or covered streets, each including two rows of stands, amounting in number to 1800, held as freehold property by various manufacturers, every stand being marked with the name of the proprietor. This hall is exclusively appropriated to the use of persons who have served regular apprenticeship to the trade or mystery of making coloured cloths. The markets are held on Tuesdays and Saturdays, and only for an hour and a half each day, at which period alone sales can take place. The market-bell rings at six o'clock in the morning in summer, and at seven in winter, when the markets are speedily filled, the benches covered with cloths, and the proprietors respectively take their stands: the bell ceasing, the buyers enter, and proceed with secrecy, silence, and expedition, to bargain for the cloth they may require; and business is thus summarily transacted, often involving an exchange of property to a vast amount. When the time for selling is terminated, the bell again rings, and any merchant staying in the hall, after it has ceased, becomes liable to a penalty. The hall is under the management of fifteen trustees, who hold their meetings in an octagonal building, erected near the entrance to this hall."

Huddersfield, *Wakefield*, *Saddleworth*, *Halifax* and *Bradford*, all in Yorkshire, and *Rochdale* in Lancashire, are other towns noted for their concern in the cloth manufacture, but of inferior population, and not distinguished by any remarkable features. *Axminster*, *Kidderminster*, *Ashton*, and *Wilton*, are the chief seats of the carpet manufacture. *Bradford*, in Wiltshire, is distinguished for superfine cloths.

Birmingham, the chief town in the kingdom engaged in metallic manufactures, is situated in Warwickshire, at the distance of 109 miles from London. The lower part of the town consists chiefly of old buildings, is crowded with workshops and warehouses, and is inhabited principally by manufacturers; but the upper part has a superior appearance, consisting of new and regular streets, and containing a number of elegant buildings. Among the public buildings, the town-hall calls for particular notice, being a magnificent structure of the Corinthian order, in the proportions of the temple of Jupiter Stator at Rome. The population of Birmingham in 1831 was 146,986, being all, except a small fraction, engaged in trade and manufactures.

Among the principal manufactures are buttons, in immense variety, buckles, cloak-pins, and snuff-boxes; toys, trinkets, and jewellery; polished steel watch-chains, corkscrews, &c.; plated goods for the dining and tea-table, now in the way of being superseded by similar goods of mixed metal; japanned and enamelled articles; brass work of every description; swords and fire-arms; medals and coins of various kinds; copying machines and pneumatic apparatus; grates, fire-irons, gas-light burners, nails, and steel-pens. Besides almost every metallic article which can be considered as curious, useful, or ornamental, cut crystal is produced to a large extent, while certain branches of the cotton trade connected with hardware, as the making of the cloth for umbrellas, braces, girths, &c., have also fixed themselves here, in order to facilitate the preparation of those articles.

The operations of the Birmingham manufactures are carried on chiefly by means of foundries, rolling mills, die-stamping machines, and turning-lathes. From the foundries proceed all heavy iron goods, and even a considerable quantity of small wares, though the work required in trimming these articles after they leave the sand causes a constant tendency towards the use of the die-stamp in preference. By the latter machine, not only are buttons and other small articles produced, but likewise complicated decorative articles of many various kinds, to which it might be supposed that the process was inapplicable. The rolling mill is a ponderous engine, for pressing out ingots of metal into sheets of requisite thinness. The lathe, a conspicuous machine in the workshops of Birmingham, is used for the preparation of articles of correctly circular, and also of oval form. It is usually driven by steam; and in many instances this power is not generated in the premises of those who use it, but is obtained for a rent from some engine kept by a different individual in the neighbourhood.

To give an idea of the extent of some branches of trade, and the activity of some kinds of machinery at Birmingham, it may be stated that, at the pin-works, some years ago, 12,000 pins could be cut and pointed, and 50,000 pin-heads made from the wire, in an hour; that there is a coining-mill which produces between thirty and forty thousand pieces of coin in the same time; and that, from 1805 to 1818, 5,000,000 stands of arms were made for public and private service. The making of steel-pens, which, before 1821, was scarcely known, is now a great manufacture. Probably not less than 10,000,000 are made annually. There is one individual in the trade who employs 250 persons, and consumes every year upwards of forty tons of metal. The article was originally sold at the rate of one shilling each pen; and now, from improvements and facilities in the manufacture, 144 are sold at the same money.

Sheffield, in the West Riding of Yorkshire, ranks only second to Birmingham as a seat of metallic manufactures. It is a town of above 100,000 inhabitants, great part of whom are engaged in the business for which Sheffield is remarkable. The situation of the town, upon a swelling piece of ground near the confluence of the Sheaf and Don, gives it health and cleanliness, but only the newer streets and suburban villas are neat, and the town is constantly involved in the smoke arising from the manufactories. A music hall, post-office, and medical hall, together with a building called the cutler's hall, in which the members of that trade meet for an annual banquet, are the chief public buildings boasting of any elegance of exterior.

Sheffield was famous in the middle ages for producing knives and arrow heads. From such small beginnings, it advanced in the course of ages to its present distinction. An immense quantity of knives, scissors, implements of husbandry, and surgical and mathematical instruments, is now made in it. The manufacture of plate, and of goods in imitation of it, as also of carpenters' tools, printing types, hair-cloth, and many other articles, is carried on to an immense extent. The manufactures of Sheffield have the peculiarity of being chiefly in the hands of men of moderate capital and limited business, though there are also a few houses which engross a vast quantity of the principal trade. The establishments for the grinding and polishing of cutlery are among the most striking objects of curiosity to a stranger; and the show-room of the Messrs. Rogers, cutlers to the late king, is a splendid museum, where all the local manufactures may be seen, of the best quality, and in the finest order

Coventry, an ancient city in Warwickshire, 91 miles from London, is a great seat of the manufacture of ribbons, and also of watches. Some other manufactures, carried on to a great extent in the last century, including gauzes and calimancoes, have declined, leaving these alone flourishing. The population in 1831 was 27,070, all except a small portion being engaged in trade and manufactures.

Coventry is an ancient town of note, and contains, besides some good modern public buildings, an old church of remarkable beauty as a specimen of Gothic architecture, and a very curious old hall (St. Mary's Hall), used for festive purposes, having a grotesquely carved oak roof, and a piece of tapestry, wrought in 1450, measuring 30 feet by 10, and containing 80 figures. The town was remarkable in early ages for the performance of the grotesque religious dramas called Mysteries, and for the shows and pageants which took place in celebration of the visits of royal personages. One pageant of an extraordinary character has been performed annually ever since the reign of Charles II. It is designed to commemorate a real or imaginary incident, which is thus related: Leofric, Earl of Mercia, who possessed the property of the tolls and services of Coventry, exacted his dues so rigidly, that the inhabitants were greatly aggrieved, and at length Godiva, his pious wife, became their advocate. The earl, wearied by her solicitations, promised to grant her request, if she would ride naked through the town at mid-day. His terms, according to the legend, were accepted, and the countess rode through the town with no covering but her flowing tresses. It is added, that she had modestly commanded every person to keep within doors and away from the windows, on pain of death, but that one person could not forbear taking a glance, and lost his life for his curiosity. The procession commemorative of this occurrence includes the whole of the officials of the corporation, besides a female of easy purchase, who rides in a dress of linen closely fitted to her limbs and coloured like them. The curious person who stole the glance is called *Peeping Tom*, and a wooden image of him is to be seen on a house in the city.

Derby, the capital of Derbyshire, is an ancient but now considerably modernized town, situated on a pleasant slope and irregular ground, on the south side of the vale of the Derwent, a river tributary to the Trent, pursuing a winding course through the county, and of great value in moving mill-machinery. Derby is the centre of one of the most productive and industrious districts in England, particularly as respects the manufacture of iron and other minerals. In the town and its neighbourhood there are large manufactories of lace, galloons, broad silks, silk hosiery, china, marble, jewellery, &c.; several extensive mills and manufactories have been built within these few years, and the machinery is equal to that of any other part of the kingdom. The town is irregularly built, and excepting some new erections in the corn-market, an infirmary, and an old church, with an elegant and conspicuous tower, it owns no public building worthy of remark. Though placed in the midst of a stone district, the houses are as usual built of brick. Within these two years, Derby has come prominently into notice by being on the line of the extended series of railways from Durham and Yorkshire to London, and the station here is of magnificent proportions: the distance from London, 126 miles, is performed by railway in about seven hours. In 1840, the town received from Mr. Joseph Strutt the munificent gift of a pleasure-ground, eleven acres in extent, and called by him the Arboretum. It is replenished with walks, seats, and every way fitted up for promenading and recreation; it is opened freely two days in the week to all classes, and on other days is accessible upon payment of a small fee. The population of Derby, in 1831, amounted to 23,627.

Carlisle, which in early times was distinguished as a bulwark against the invasions of the Scottish armies, and as a cathedral city, has latterly acquired some note as a seat of manufactures, particularly in the department of cotton-spinning, calico-printing, and the weaving of ginghams, &c. The establishment of a railway communication with Newcastle has within the last few years added to its mercantile prosperity, by rendering it an entrepôt for produce passing from the west coast and from Ireland to the populous counties of Durham and Northumberland. Population, 20,006.

Commercial Towns.

At the head of this class stands *Liverpool*, next to London the greatest port in the empire. It is situated in Lancashire, on the east bank of the estuary of the Mersey, at the distance of 30 miles from Manchester, and 204 from London. The town extends for about three miles along the Mersey, and rather more than one mile inland, the situation enjoying a slight slope towards the river. On the side next the country, the town extends into numerous suburban districts, comprehending many villas, the residences of the more wealthy citizens. Liverpool, in 1831, contained 165,175 inhabitants; but, inclusive of the immediate environs, and the persons engaged in navigation, the whole number in 1835 was believed to be not less than 220,000. Its rise has been surprisingly rapid. In the reign of Elizabeth, it was only a small village; in 1700, there were about 5000 inhabitants; in 1760, 26,000; and, in 1801, 77,653.

Liverpool is the grand medium through which the trade of England with Ireland and America is carried on; and a vast quantity of business is transacted by its merchants with the ports of the Mediterranean, East Indies and other parts of the world. The leading article of import is the cotton so extensively used in the manufactures of Lancashire, of which, in 1830, out of 793,695 bales imported into England, 703,200 were brought into Liverpool. The rural produce of Ireland, cattle, bacon, poultry, eggs, &c., forms the import next in amount, the value in 1832 being about four and a half millions sterling. The duties paid at the custom-house of Liverpool, in 1837, were £4,351,496, being about a fifth of those paid throughout the whole kingdom. In the same year, the vessels entered inwards exclusive of those concerned in the fisheries and coasting trade, were—British, 1685, foreign, 985; in all, 2670. Those entered outwards were—British, 1735; foreign, 1012; in all, 2747. But when the fisheries and coasting trade are included, the number of British vessels entering Liverpool that year reaches the amazing number of 10,281, each being upon an average of 200 tons. Liverpool is the great outlet for the goods manufactured in Lancashire and Yorkshire for sale in America. It is stated that one mercantile house in the American trade, has in one year shipped and received goods to the amount of a million. In connection with the commerce carried on with the United States, there is a large transit of passengers. This was formerly carried on by means of a periodical series of well-appointed and quick-sailing vessels, usually termed *liners*; but for three years past, it has been conducted by means of steam-vessels. There are also steam vessels conveying passengers, daily, to and from Dublin, Glasgow, and several Welsh ports, and only a little less frequently to other Irish harbours, and to several ports in the south-west division of England.

The town, thus so extensively concerned in that commerce from which England derives its chief glory, presents many external features not unworthy of its mercantile character. Of these the chief is the *Docks*, a magnificent series of deep-water harbours, extending along the whole front of the town. They are eleven in number, with an aggregate superficies of 111 acres, and

eight miles of quays! In the year ending June 24, 1840, the dues paid by vessels entering and leaving them was £197,477, 18s. 6d. The sight of these docks, bristling with numberless masts, and a scene of constant bustle from loading and unloading, fills a stranger with astonishment.

The town contains several handsome streets, the chief being Castle street and Dale street. The Town-hall and Exchange buildings form an elegant and impressive assemblage of objects, having a bronze group in the intermediate court, commemorative of the death of Lord Nelson. The Custom-house is, as might be expected, a conspicuous edifice, but in a heavy style of architecture. The other public buildings—the Corn-Exchange, Lyceum, Athenæum, Wellington Rooms, Infirmary, &c., are goodly structures. There are upwards of twenty churches belonging to the establishment, many of them of much architectural beauty; a greater number of chapels belonging to various denominations of dissenters; with four Roman Catholic chapels, a meeting-house for quakers, and a Jews' synagogue. The charitable institutions are numerous and well conducted. About 1500 patients are admitted annually into the Infirmary. The Blue-Coat Hospital maintains and educates about 200 boys and girls. The school for the blind is on a most extensive scale. A handsome and spacious theatre, and a circus, are open during great part of the year. At the Royal Liverpool Institution, public lectures are given; and attached to it is a philosophical apparatus and a museum of natural curiosities. A botanic garden was established in 1801, at an expense of about £10,000. There is also a mechanics' institution of unusual extent and elegance, having been erected at an expense of £11,000. It includes schools for the young, as well as for the adolescent; and in the amount of its funds, and variety of the branches of knowledge taught, the establishment may be described as a kind of university for the middle and working classes of Liverpool. Among the remarkable objects connected with the town, the ornamental Cemetery of St. James's, formed out of an old stone quarry, is worthy of particular notice. It contains a statue of Mr. Huskisson, who was interred in it. The Manchester and Liverpool Railway is noticed elsewhere.

Bristol, a large sea-port town, is situated partly in the county of Somerset, and partly in that of Gloucester, at the junction of the rivers Avon and Frome, and about ten miles from the junction of the former (which is navigable) with the Bristol Channel. It is one of a few English towns which possess the dubiously acknowledged privilege of being counties in themselves, and it is also the cathedral city for the diocese of Bristol. Bristol is an ancient town, and has long enjoyed distinction as a sea-port. Previous to the rise of Liverpool, to which it is now greatly inferior, it was the chief port of the west of England. It still possesses considerable trade, and has further of late years become the seat of some active and thriving manufactures. In 1837, 386 ships, of 76,957 tons burden, entered the harbour from foreign ports, besides 632 from Ireland; and in the same year, the customs duties collected were £1,153,109. Sugar, rum, and tea, are the chief foreign imports, while the chief exports are the native manufactures, and cotton, woollen, and linen goods. The chief native manufactures are soap, glass bottles, various metallic wares, drugs, dyes, and soda. It is honourable to Bristol that, as in its ancient days of supereminency as a port, it sent out the first English vessel across the Atlantic (that of Cabot, which discovered North America), so, in these days, it was the first to establish a communication by steam with the same continent. This was done in 1838, when the Great Western performed its first voyage. The population of Bristol, in 1831, was 117,016.

Bristol is a well-built town, containing many spacious streets and squares, and extending into several beautiful suburban villages, as Clifton, Kingsdown, and St. Michael's, where the residences of the wealthiest citizens are placed. The city contains many public structures of an interesting character. The cathedral is a fine old specimen of the Gothic architecture, and the Church of St. Mary Redcliffe is considered one of the most beautiful in England. The "floating harbour," formed out of the ancient beds of the two rivers, and surrounded by an immense extent of quay, is a most impressive object: the cost of its construction was not much less than £700,000. The Guildhall, Jail, Commercial Rooms, and Institution (which contains a library, hall for lectures, &c.), are other public buildings of an elegant appearance. Clifton, being the site of a well-known hot well, contains a suit of baths and pump-rooms.

Newcastle-on-Tyne.—This ancient and prosperous seat of commerce occupies a somewhat incommodious situation on the left or north bank of the Tyne, at the distance of about ten miles from the sea. It is locally in the county of Northumberland, and by means of a bridge across the Tyne is connected with the populous borough of Gateshead, in the county of Durham. It owes the

Newcastle-on-Tyne.

origin of its name to Robert, the eldest son of William the Conqueror, who erected a fortress on the high bluff which here overhangs the river, and gave it the name of Newcastle. For ages the town was surrounded by strong walls, as a protection against invading Scottish armies: these, however, have disappeared, and in modern times the town has spread over the irregular acclivities and upland which border the river. The old fort or castle still exists, also the ancient Gothic Church of St. Nicholas, whose elegant turret is conspicuous at a considerable distance. The main cause of the increasing importance of Newcastle is its fortunate situation in the midst of the great coal-field of Northumberland and Durham, the produce of which finds a ready outlet by the Tyne. The plentifulness of coal has led to the establishment of numerous manufactures, among which are numbered cast and wrought iron, machinery, lead, glass, chemical productions, pottery, soap, and glue. The number of vessels, British and foreign, which entered the port in 1838, was 1835, with a burden of 242,004 tons. The gross receipts at the custom-house for the same year were £379,360. The older parts of the town near the river exhibit a busy scene of industry; here are crowded together ship and boat-building yards, wharfs for vessels, iron founderies and machine manufactories, and all the usual works connected with a great sea-port. The streets in this quarter are dirty and smoky, but other parts of the town are of great elegance. Since 1834, by the extraordinary energy and taste of Mr. Richard Grainger, a speculating architect, a large portion of the town has been taken down and rebuilt with handsome stone houses, amidst which are various public buildings, including a theatre, an exchange, extensive markets, &c. Newcastle must be considered the metropolis of a rich and populous district, including Tynemouth, North and South Shields (all at the mouth of the Tyne), Sunderland, Durham, and Gateshead; and with these it is intimately connected by means of the river, railways as

otherwise. At Shields and Sunderland are the great depôts of shipping in the coal and other trades. Besides its remarkable manufacturing and commercial industry, Newcastle is distinguished for its philosophical and literary institutions, no other town of its kind possessing so many inhabitants of cultivated taste. In 1831, including the population of Gateshead, which was 15,177, Newcastle and its suburbs had a population of 68,790; but at present it is estimated at 100,000.

Hull (properly Kingston-upon-Hull) is situated at the confluence of the River Hull with the estuary of the Humber, in the East Riding of Yorkshire, of which district it is the principal town. It commands an extraordinary amount of inland navigation, not only by means of the Trent, Ouse, Derwent, and other branches of the Humber, but by means of canals connecting with those streams, and penetrating to the very heart of England. It is the principal outlet for the manufactures of York and Lancashire towards the continent of Europe, the chief seat of the northern whale fishery, and one of the most important stations for steam-navigation in the island, having packets of that kind voyaging not only to London, Newcastle, Leith, and Aberdeen, besides many inland places in its own district, but to Rotterdam, Hamburgh, and occasionally to some of the ports in what is more particularly called the north of Europe. Hull was a noted port so early as the reign of Edward I.; and in the seventeenth century it was a great state depôt for arms, on which account the possession of it in the time of the civil war became an object of much importance. The refusal of its governor, Sir John Hotham, to give it up at that time to Charles I., or even to admit his majesty within the gates, is a conspicuous incident in English history. For some years, owing to various circumstances, some branches of the commerce of the port have experienced a decline rather than an advance; but it is still a town of large trade. In 1829, 579 vessels, of 72,248 aggregate tonnage, belonged to Hull. For the accommodation of the shipping there is a splendid range of docks, presenting an amount of quayage said to measure 60,000 square yards, and with all the suitable accommodations for storing a vast quantity of merchandise. The population of the town is about 50,000.

Chester is one of the less important and less populous of the commercial towns of England. Such importance, however, as it possesses as a commercial town, is enhanced by its being a county town and cathedral city, and the residence of a considerable number of persons in independent circumstances. It is also remarkable for its antiquity and its historical associations, as well as for some local features of an unusual kind.

It is situated within a bend of the Dee, a few miles from the point where that river joins an estuary branching from the Irish Channel. The two principal streets cross each other at right-angles, and the town is still surrounded by the massive walls which were originally designed to protect it from warlike aggression, but are now only useful as an agreeable promenade, from which some pleasant views of the surrounding country may be obtained. The streets are formed in hollows dug out of rock, so that the lowest floor of each house is under the level of the ground behind, though looking out upon the carriage-way in front. The paths for passengers are not here, as is usually the case, formed in lateral lines along the streets, but in a piazza running along the front of what in England is called the *first*, and in Scotland more correctly the *second* floor, of the houses. These piazzas, called in Chester *the Rows*, are accessible from the street by stairs at convenient distances. There are numerous shops entered from them, and they in some places still retain the massive wooden balustrades with which all were originally furnished, but for which, in other places, light iron railings have been substituted. Where the houses and balustrades are old the effect is very curious and striking, and apt to awaken ideas of ancient usages and habits long passed away. The Cathedral of Chester contains some curious ancient architecture. The Castle is a splendid modern building, on the site of the powerful fortress which was once of such importance as a check upon the Welsh: it contains the county court-house, jail, &c. The principal other buildings are the Halls built by the merchants to serve as marts, of which there are three, besides the Exchange. The bridge across the Dee is a remarkable object, being of one arch, with a span of 200 feet: it cost £40,000.

Chester was an important station of the Romans, from whom it derived the cross form of its two principal streets, and of whom many relics have from time to time been dug up. It retained its importance during Saxon and Norman times, and in the thirteenth and fourteenth centuries was a flourishing city, with a large maritime trade. It then declined, in consequence of natural obstructions to the navigation of the river. From the year 1328 downwards, it was remarkable for the annual performance of a peculiar class of theatrical representations, similar to those performed at Coventry, and termed Mysteries. To modern taste these would seem the most gross burlesque of sacred subjects; but so convinced were the clergy of those days of their edifying qualities, that a thousand days of pardon from the pope, and forty from the Bishop of Chester, were granted to all who attended them. After a long period of declension, the trade of Chester was revived by the cutting of a new channel for the river, whereby vessels of 600 tons burden were enabled to come to the quays near the town. The commerce, with the exception of a few ships which visit Spain, Portugal, the Mediterranean, and the Baltic, is chiefly confined to Ireland, whence an immense quantity of linen, hemp, flax, skins, and provisions, is imported. The exports of Chester are cheese (the staple production of the county), lead, coal, calamine, copper-plates, and cast-iron. Ship-building is carried on to a considerable extent, and there are some manufactures of inferior consequence. The population of Chester in 1831 was 21,363.

Southampton is an ancient but considerably modernized town, the capital of Hampshire, and, next to Portsmouth and Plymouth, may be considered the chief outport on the south coast. It enjoys a situation at once pleasant and convenient, in a vale adjoining to the bay bearing its own name. In modern times, the town has been greatly improved and increased by the erection of lines of handsome streets in the environs, the residence of a respectable and leisurely population. Among the attractions of the neighbourhood, are those of the New Forest, which almost adjoins the town, and a beach forming a pleasant bathing-place in summer: few sea-side towns are more salubrious or agreeable. With the Isle of Wight, at a few miles' distance, there is a constant communication by steamboats. The South-Western Railway, which terminates near the shore of the bay, has greatly advanced the interests of the town, by making it a depôt of traffic in connection with the metropolis; and there are now constructing, at a great cost, large wet-docks and wharfs for shipping. A considerable trade is already carried on with foreign countries, and the port is a main point of communication between England and Guernsey, Jersey, and Havre, in which, and some other respects, it is a rising rival of the neighbouring town of Portsmouth. The population in 1831 was 19,324.

University Cities.

Oxford, the chief of this limited class of cities, is the principal town in Oxfordshire, and is situated in a valley at the confluence of the Isis and Cherwell, at the distance of 58 miles from London. Besides being the seat of the celebrated university named from it, it is the seat of an episcopal see. Containing twenty colleges and five

"halls," a cathedral, and thirteen elegant parish churches, besides the Radcliffe Library, the University Theatre, and several other elegant public buildings, all condensed into a small space, amidst streets, some of which are straight and elegant, while none except a few of an obscure character are mean, Oxford appears to a stranger as beautiful externally as its historic character renders it venerable. The High Street, in which several colleges are situated, is generally acknowledged to be one of the finest streets in the world. The origin of the university is usually attributed, but upon no certain authority, to King Alfred. Oxford has certainly, however, been a famed seat of learning since the twelfth century. Each college and hall has its own students and teachers, revenues and regulations; yet they are all united under the government of one university. The officers by whom the university is immediately governed, are the chancellor, high steward, vice-chancellor, and two proctors. In addition to the private officers in each college and hall, who see that due order and discipline are preserved, and all the liberal sciences taught, there are twenty-three public professors of the several arts and sciences. In 1829, there were 5009 members on the books, one-third of whom, in their capacities as fellows, &c., were maintained by the revenues. The students wear a peculiar dress, varied according to their status in the college. They all live within the precincts of their respective colleges.

Cambridge is the chief town in Cambridgeshire, and is situated on the Cam, at the distance of 50 miles from London. It is also an elegant city, though less so than Oxford. The university has no certain date before 1229: it comprehends seventeen colleges, which in most respects are similar to those of Oxford. King's College Chapel, built in the reign of Henry VI., is considered the most beautiful structure in either of the two university towns.

Naval Stations.

Portsmouth, the principal rendezvous of the British navy, is situated on the west side of the Isle of Portsea in Hampshire. To the west of the island is the bay called Portsmouth Harbour, excelling every other on the coast of England for its spaciousness, depth, and security. The obvious utility of this harbour in such a situation, caused it to be used at an early period as a station for shipping, and hence the rise of the town of Portsmouth on the narrow inlet by which it communicates with the English Channel. It is also to be observed, that the strait between the mouth of this harbour and the Isle of Wight, forms the celebrated roadstead of Spithead, which is capable of containing a thousand sail at anchor in the greatest security. The original or old town of Portsmouth, surrounded by ancient walls; the modern suburban towns of Portsea and Southsea, respectively situated to the north and south of the original town; and the town of Gosport, on the opposite side of the inlet to the harbour, may all be said to form one cluster of population, probably numboring not less than 40,000. The beach opposite Southsea being well adapted for sea-bathing, has caused that suburb or village to become a watering-place of some note.

The docks, arsenal, building-yards, and all the various other establishments concerned in the fitting out and safe keeping of the national shipping, render Portsmouth an object of wonder to all who see it for the first time. The Dockyard includes the great area of 100 acres. The Smithery is a vast building, where anchors are wrought, weighing from seventy to ninety hundredweight each. On the Anchor-Wharf hundreds of these useful implements are piled up, ready for immediate service. The Ropery, where the cordage for the vessels is prepared, is three stories high, 54 feet broad, and 1094 feet long. The Gun-Wharf is an immense arsenal, consisting of various ranges of buildings for the reception of naval and military stores, artillery, &c. The Small Armoury is capable of containing 25,000 stand of arms. There is a naval college, where a hundred scholars, in time of war, and seventy in time of peace, are taught; thirty, who are the children of officers, being maintained and educated at the public expense. During war, the number of persons employed in the various establishments connected with the public service at Portsmouth, has amounted to 5000. The principal buildings connected with the arsenal and dockyards, are the commissioner's house, the government house, the victualling office, the port-admiral's house, and the naval and military barracks. The promenade along the fortifications forms one of the most agreeable features of the town. Among objects of curiosity, we may specify the Victory, Nelson's flag-ship at Trafalgar; the Semapore Telegraph; and the house (No. 110, High street) in which the Duke of Buckingham was temporarily residing, when, in front of it, he was stabbed to death by Lieutenant Felton, in 1628. The church of Portsmouth is a spacious Gothic structure, with a comparatively modern tower, useful as a landmark to seamen. There are various charitable, literary, and scientific institutions connected with the town.

Plymouth is another important naval station, besides being a thriving commercial town. It is situated at the head of the spacious haven of Plymouth Sound, in Devonshire, on the east side of a tongue of land formed by the estuaries of the rivers Plym and Tamar, which here empty themselves into the sea. Essentially connected with Plymouth is *Devonport*, situated in the immediate neighbourhood, and properly an appendage of Plymouth, though of late years distinguished by a separate name. The united population, in 1831, was 75,534. Plymouth having gradually risen from the condition of a small fishing-town to its present size, most of the streets are irregular, and by no means elegant or commodious, but the new parts of the town are handsome, and are spreading rapidly.

Plymouth carries on a considerable trade in timber with North America and the Baltic, and a intercourse has been established with the West Indies. The coasting trade is chiefly with London, Newcastle, Newport, (in Wales), and Bristol. The chief imports are coal, culm, corn, wine, and timber.

It is as a naval and military station that the town is chiefly distinguished. Situated upon a capacious and secure nntural harbour, near the mouth of the English Channel, it is well adapted for this purpose, fleets having a ready exit from it upon any expedition towards the Mediterranean, the Indies, or America. The dock, which is situated at Devonport (formerly on that account called Plymouth Dock), extends along the bank of the Tamar, in a curve 3500 feet in length, with a width at the middle, where it is greatest, of 1600 feet, and at each extremity 1000, thus including an area of 96 acres. Of the fortifications connected with Plymouth, the most remarkable is the citadel, which was erected in the reign of Charles II. It is placed in a most commanding situation on the east end of the height called the *Hoe*, which shelters the town from the sea. It is exceedingly well fortified, and is constantly garrisoned. It contains the residence of the Governor of Plymouth, and barracks for five or six hundred troops. The Victualling Office, an important establishment, containing storehouses, granaries, baking-houses, and cellars for supplying the meat, bread, and liquors required to provision the vessels of the Royal Navy, occupies a splendid building in the adjacent township of East Stonehouse. The port of Plymouth is distinguished for its capacity, and the security which it affords in its several parts. It is capable of containing 2000 sail, and is one of the finest harbours in the world. It consists of three divisions or harbours—Sutton Pool,

immediately adjoining the town; Catwater, an extensive sheet, formed by the estuary of the Plym; and the harbour or bay of Hamoaze. At the mouth of these harbours, the great bay of Plymouth Sound forms an excellent roadstead, which is now completely secure by the erection of the breakwater across its entrance. This work is an insulated mole, or vast heap of stones, stretching across the entrance of the sound so far as to leave a passage for vessels at either end, and opposing a barrier to the heavy swell rolling in from the Atlantic. Its length is 1700 yards, the eastern extremity being about 60 fathoms to the eastward of St. Carlos's Rocks, and the western, 300 west of the Shovel Rock. The middle part is continued in a straight line 1,000 yards, and the two extremities incline towards the northern side of the straight part in an angle of about 120 degrees. This great work was begun, August 12, 1812. During its progress convincing proofs of its efficacy and utility were afforded. The expense of erecting the breakwater is estimated at £1,171,100. The Eddystone Lighthouse is an important appendage to the harbour, the entrance of which would, without this beacon, be extremely dangerous.

The public buildings of Plymouth are, the Customhouse, the Exchange, the Athenæum, the Public Library, the Theatre, the Classical and Mathematical School, the Mechanics' Institute, &c. Of the two parish churches, the most ancient is that of St. Andrew, built previously to 1291, a handsome building of the Gothic order; Charles's Church is also a Gothic structure. Among the charitable institutions, which are about thirty, are a workhouse, a public dispensary, an eye-infirmary, a lying-in charity, a public subscription school, almshouses, Bible societies, &c.

Towns of Residence and Recreation.

Bath.—This is reckoned the best built town in England, and is a favourite residence of the higher classes, either for recreation or in pursuit of health. It is situated in Somersetshire, at the distance of about 108 miles west from London, and lies in a valley divided by the River Avon. Though of great antiquity, the place came into notice and rose to importance in comparatively modern times, in consequence of possessing certain hot mineral springs, considered to be efficacious in the cure of different complaints. The water issues from the ground at a temperature of from 109° to 117° of Fahrenheit, and the quantity discharged daily from the various outlets is 184,320 gallons. The water has been analyzed, and is found to contain sulphate of lime, with considerably lesser proportions of muriate of soda, sulphate of soda, carbonic acid, and carbonate of lime, also a minute portion of silica and oxide of iron. It is stimulating in its properties, and is said to be most successful in cases of palsy, rheumatism, gout, and cutaneous diseases. Over the springs there are elegant pump-rooms and baths. The modern parts of the town are built as streets, crescents, and squares, the houses being of polished sandstone, and in some instances constructed with much taste. Living is expensive in the town during the fashionable season. The population in 1831 was 38,063.

Cheltenham competes with Bath as a fashionable resort for valetudinarians, real or imaginary. It is situated in Gloucestershire, 88 miles west from London, and 39½ north-east of Bath. The situation is exceedingly delightful, being remarkably well sheltered by the range of Cotteswold Hills on the north-east, and having an exposure to the south and west; it is on this account preferred to all other towns in England by persons from India and other hot climates. Besides being attractive from the salubrity and mildness of its climate, Cheltenham, like Bath, possesses mineral springs reckoned of value for medical purposes, but particularly for invalids with diseased livers. There are several springs, some of which are chalybeate, but their properties and strength are liable to variation. Cheltenham is laid out, in a very ornamental manner, with walks and pleasure-grounds, and may be described as perhaps the prettiest town of a small size in England. As in Bath, the expense of living is very great. The population of the parish in 1831 was 22,942, about one-half of whom belonged to the town.

Brighton, on the coast of Sussex, has risen into importance within the last sixty years, partly in consequence of a beach remarkably well adapted for sea-bathing, and partly from its attracting the regard of George Prince of Wales, who reared a marine palace here, in a Chinese style. The population in 1831 was 40,634. Brighton is an elegant and airy town, with much to render it agreeable as a place of residence for persons in affluent circumstances. The Steyne, a spacious and beautiful lawn, nearly surrounded by houses, the Marine Parade, and several terraces overlooking the sea, furnish delightful walks; while the Baths, Theatre, Assembly Rooms, &c., form additional attractions. There is a regular intercourse with Dieppe by steam-vessels. The Chain-Pier is a remarkable object: it was erected in 1823 at an expense of £30,000, and is 1134 feet long.

Among other towns of this class, we can only notice *Herne Bay*, *Margate* and *Ramsgate*, situated on the coast of Kent, and which may be considered as the chief places of summer recreation for the inhabitants of London, to and from which steamers ply daily. Herne Bay is a place of recent date, rising into notice, and possessing a pleasant open beach, with space for promenading. Margate is a town of a much earlier date, situated in an open part of a bold line of chalky cliffs, and consists of a confused cluster of streets, with some lines of building of a more airy description in the environs. The town is well supplied with shops, bazaars, and places of amusement during the bathing-season; it also possesses numerous respectable boarding-houses, where, on moderate terms, a person may reside for a short time in a very agreeable manner. At these houses, parties of pleasure are made up for the day, the expense of cars and refreshments during the excursion being defrayed by general contribution. Within a mile or two along the coast is another summer retreat called *Broadstairs*; and beyond it, at an equal distance, is Ramsgate. The chalk cliffs here, which are bold and precipitous, afford a high and salubrious position for the chief part of the town, and beneath there is a fine tract of sandy beach for the use of bathers. The harbour at Ramsgate is one of the best in England, and affords shelter to all kinds of vessels in the Downs.

Cathedral Towns.

Of this class of towns, besides those which have been already noticed under other heads, we can here only advert to three of more than usual importance.

Canterbury, the capital of Kent, is a city of great antiquity, having formed the seat of an ecclesiastical establishment to St. Augustine, the apostle of Christianity to Britain in the sixth century. In the tenth and eleventh centuries, the town derived great importance from the erection or extension of a cathedral, on a most extensive scale, and of the purest Gothic architecture. In 1162, the archiepiscopal see was bestowed on the famous Becket, who enjoyed it eight years, till the period of his murder in 1170, when his shrine became an object of extraordinary reverence, and brought pilgrims in thousands from all parts of the kingdom. The cathedral, which thus became celebrated, still exists, in a slightly altered and improved condition. Its form is that of a cross, with a central tower of unrivalled workmanship, reaching to a height of 236 feet. The size of the building is immense: the length inside, from east to west, being 514 feet; height of the vaulted roof, 80 feet; breadth of the nave and side aisles, 71 feet; and breadth of the

cross aisles, from north to south, 124 feet. The interior exhibits a number of interesting monuments of distinguished individuals. Altogether, the cathedral is a work of exceeding grandeur, and, with exquisite beauty of form, possesses a profound historical interest. The town of Canterbury is old, and, like most cathedral towns, is a dull and formal place of residence, with a proportion of genteel inhabitants. It is, however, neat and clean, and is surrounded by a fertile and pleasant tract of country. It has a number of large hotels and posting-houses, to accommodate the numerous travellers passing between the metropolis and Dover, the chief out-port for France. The distance from London is 56 miles, and from Dover 16. A railway which is now preparing between London and Dover, and which does not touch Canterbury, will, in all likelihood, completely ruin it as a posting-station. The only object of attraction in the town, besides the cathedral, is a pleasure-ground called the Danejohn, a corruption of the word donjon, such a building having once occupied the spot, in connection with the city walls. The area of the field is laid out with an avenue of trees, and is principally otherwise a grassy esplanade, open freely to all the inhabitants. In 1790, the field was presented by Mr. Alderman James Simmonds for the use and recreation of the inhabitants in all time coming, an act of generosity deserving the highest commendation. The population of Canterbury in 1831 was 14,463.

York.—This ancient city, considered as the second in the kingdom in dignity—the chief town of the county, and the cathedral city of the archiepiscopal diocese bearing its name—is situated at the confluence of the Rivers Foss and Ouse, in one of the richest and most extensive plains in England. Its population in 1831 was 25,359. York, whatever its first rise might be, was a city of the Romans, and occupied by Roman citizens as a *colony*. It was successively the seat of Adrain, Severus, and other emperors: Severus died here in the year 210. At the time of the Norman conquest, it was a city of considerable consequence. This eminence it retained for several centuries, but latterly it has sunk into a mere county and cathedral town, that is to say, a place where a considerable number of legal and ecclesiastical functionaries reside, and from which articles of necessity and luxury are diffused over a neighbouring rural district.

It is entered by four principal gates or bars, has six bridges, a cathedral, twenty-three churches, besides places of worship for various dissenting bodies; a guild-hall, county-hall, and other public buildings. The most remarkable object by many degrees is the Cathedral, or Minster, a most superb specimen of the Gothic architecture, measuring in length 524½ feet; in breadth across the transepts, 222 feet: the nave being in height 99, and the grand tower 213 feet. The various parts were built at different times between 1227 and 1377. The parts most admired are the east window and the screen dividing the choir from the body of the church. This window consists of upwards of 200 compartments of stained glass, containing representations of the Supreme Being, saints, and events recorded in Scripture. The screen is a piece of carved wood-work in a highly ornamental style. The chapter-house is also much admired: it is a magnificent structure, of an octagonal form, 63 feet in diameter and 68 feet in height. York Minster has, within the last few years, twice suffered severely from fire. The damage produced on the first occasion, namely, the destruction of the wooden work in the choir, was completely and successfully repaired; that which took place on the second occasion, and which consisted of the destruction of the interior of one of the smaller towers and the roof of the nave, is in the course of being also repaired.

York was at one time a commercial town of some importance, conducting trade by means of the River Ouse, which is navigable for vessels of 120 tons burden. It still possesses a few small manufactures.

Winchester, a town of great antiquity in Hampshire, at the distance of 62 miles from London, is situated in the bottom of a rich grassy vale, through which flows the Itchin, a small river which issues into the sea at Southampton. There was a town here before the Christian era, and it afterwards became the principal city of the Danish, Saxon, and Norman dynasties. It was the scene of Alfred and Canute's glories; and here, with innumerable princes, bishops, and abbots, they lie interred. Till the revolution, it continued a chief place of residence of the royal family; a palace built by the Stuarts is now used as a barrack for soldiers. In the reign of Edward III. (1366), Winchester became the episcopal see of the celebrated William of Wykeham, who greatly improved the cathedral, and instituted a college for the education of youth. The cathedral has undergone various mutations; but being lately repaired and cleaned, is now one of the finest structures of the kind in Britain. The splendid mausoleum of William of Wykeham, in one of its aisles, is an object of great interest. At a short distance from the cathedral are placed the venerable buildings composing the College of Wykeham, at which a number of young gentlemen are educated and prepared for the university. Another highly interesting object of antiquity is the Hospital of St. Cross, situated about a mile down the Itchin. Founded by Henry de Blois, Bishop of Winchester, and brother of King Stephen, in 1136, at St. Cross, is the most perfect specimen remaining in England of the conventual establishments of the middle ages, and affords a residence and means of subsistence to thirteen indigent old men. Winchester is composed of a variety of old streets, and seems among the least improved towns in England. Latterly it has been inspired with a little animation, by becoming a station on the line of the London and Southampton Railway. Population in 1831, 9212.

LONDON:

A DESCRIPTION OF AND GUIDE TO THE BRITISH METROPOLIS.

London, the capital of England and metropolis of the British empire, is situated on the banks of the Thames, in the counties of Middlesex and Surrey, and within a day's journey of the southern shore of Britain.* On the spot now occupied by the city, or more ancient part of the metropolis, which is on the left or northern bank of the Thames, a town had been built and possessed by the Romans eighteen centuries ago, and from that period it has constantly been the seat of an increasing and busy population. Its chief increase and improvement, however, have been since the great fire in 1666, which destroyed a large number of the old streets and public edifices.

The original city was fortified by a wall, which has long since been removed, to allow of an expansion into the adjacent fields; and as the number of houses and streets without the old line of wall has at length greatly exceeded those within, *the city*, as it is still named, is like a mere kernel in the mass. The extending city has in time formed a connection with various clusters of population in the neighbourhood, including Westminster on the west, and by means of bridges, Southwark and Lambeth on the south. The whole metropolis, reckoning by continuous lines of houses, extends to a length of nearly eight miles, by a breadth of from six to seven; and it is computed that the whole includes at least thirty-five square miles.

The following is the list of districts included within what is usually described as London, with their population in 1831:—London within the walls, 57,695; London without the walls, 67,878; city of Westminster, 202,080; out parishes within the bills of mortality, 761,348; parishes not within the bills of mortality, 293,567; Southwark, 91,501; total, 1,474,069. London within the walls contains ninety-eight parishes, most of which are very small in size, but at one time were very populous. The practice of living out of town, and of using the dwellings of the city for warehouses, has greatly lessened the population in latter times. Without the walls, there are eleven parishes, independently of the parishes in Westminster and Southwark. The largest and most populous of the suburban parishes is Marylebone. Adjoining the suburban though really town parishes, there are various country parishes, as Greenwich, Deptford, Camberwell, Clapham, Westham and Stratford, Hammersmith, Hampstead, &c., containing an aggregate population of 129,480; and adding this number to the above 1,474,069, there was within a compass of about eight miles round London, in 1831, a population of 1,584,042, which is probably now increased to nearly two millions. Within the last fifty years, London has doubled in extent, and at present is rapidly increasing on all sides, particularly on the north, west, and south. In no town in Great Britain are there to be seen so few empty houses. The total assessed rental of the metropolis in 1830 was £5,143,340, but the real rental was supposed not to be less than £7,000,000.

The increase of London to its present enormous size, has been promoted by certain highly favourable circumstances. First, it has for ages been the capital of England, and seat of the legislature and court; and, since the union with Scotland and Ireland, it has become a centre also for these parts of the United Kingdom. Being, therefore, a point of attraction for the nobility, landed gentry, and other families of opulence from all quarters, a vast increase of population to minister to the tastes and wants of these classes has been the result. While deriving immense advantages from this centralizing principle, London has been equally, if not yet more, indebted to its excellent situation on the banks of a great navigable river, and in a fine part of the country. As already mentioned, London proper, or the greater part of the town, stands on the left bank of the Thames, on ground rising very gently towards the north; and so even and regular in outline, that among the streets, with few exceptions, the ground is almost flat. On the south bank of the river, the ground is quite level, rather too much so; and on all sides the country appears very little diversified with hills, or any thing to interrupt the extension of the buildings. The Thames, that great source of wealth to the metropolis, is an object which generally excites a lively interest among strangers. It is a placid majestic stream, rising in the interior of the country at the distance of 138 miles above London, and entering the sea on the east coast about sixty miles below it. It comes flowing between low, fertile and village-clad banks, out of a richly ornamented country on the west, and arriving at the outmost houses of the metropolis, a short way above Westminster Abbey, it pursues a winding course between banks thickly clad with dwelling-houses, warehouses, manufactories, and wharfs, for a space of eight or nine miles, its breadth being here from a third to a quarter of a mile. The tides affect it for fifteen or sixteen miles above the city; but the salt water comes no farther than Gravesend, or thirty miles below it. However, such is the volume and depth of water, that vessels of seven or eight hundred tons reach the city on its eastern quarter at Wapping. Most unfortunately, the beauty of this noble stream is much hid from the spectator, there being no quays or promenades along its banks. With the exception of the summit of St. Paul's, the only good points for viewing the river are the bridges, which cross it at convenient distances, and by their length convey an accurate idea of the breadth of the channel. During fine weather, the river is covered with numerous barges or boats of fanciful and light fabric, suitable for quick rowing; and by means of these pleasant conveyances, as well as small steamboats, the Thames forms one of the chief thoroughfares.

*In latitude 51° 30′ 47″ north. The name London is traced to a Celtic or British origin, though some doubts are entertained respecting its exact signification. The more common opinion is, that it originates in the words *Llin*, a pool or lake, and *din*, a town or harbour for ships. As the Thames at one time spread into a lake on the Surrey side, this signification is sufficiently descriptive of the local position of the metropolis.

London is fortunate in a particularly salubrious situation, whether as respects its relation to the river or its subsoil. A large portion of the entire city is built on gravel, or on a species of clay resting on sand; and by means of capacious underground sewers in all directions, emptying themselves into the Thames, the whole town (with some discreditable exceptions in the humbler and more remote class of streets) is well drained and cleared from superficial impurities. On account of the want of stone here, as in many other places in England, brick is the only material employed in building. London is therefore a *brick-built town*. To a stranger, it appears to consist of an interminable series of streets of moderate width, composed of dingy red brick houses, which are commonly four stories in height, and seldom less than three. The greater proportion of the dwellings are small. They are mere slips of buildings, containing, in most instances, only two small rooms on the floor, one behind the other, often with a wide door of communication between, and a wooden stair, with balustrades, from bottom to top of the house. It is only in the more fashionable districts of the town that the houses have sunk areas with railings; in all the business parts, they stand close upon the pavements, so that trade may be conducted with the utmost facility and convenience. Every street possesses a smooth flagged pavement at the sides for foot passengers; while the central parts of the thoroughfares are causewayed with square hard stones, or paved in some other way equally suited to endure the prodigious tear and wear created by the horses and vehicles passing along them.

In the central and many other principal streets of London, the ground stories of the houses are generally used as shops or warehouses. When the object is retail traffic, the whole range of front is usually formed into door and window, so as to show goods to the best advantage to the passengers. The exhibition of goods in the London shop windows is one of the greatest wonders of the place. Every thing which the appetite can desire, or the fancy imagine, would appear there to be congregated. In every other city there is an evident meagreness in the quantity and assortments; but here there is the most remarkable abundance, and that not in isolated spots, but along the sides of thoroughfares miles in length. In whatever way the eye is turned, this extraordinary amount of mercantile wealth is strikingly observable; even in what appear obscure alleys or courts, the abundance of goods is found to be on a greater scale than in any provincial town.

The flowing of the Thames from west to east through the metropolis, has given a general direction to the lines of streets; the principal thoroughfares are in some measure parallel to the river, with the inferior, or at least shorter, streets branching from them. Intersecting the town lengthwise, or from east to west, are two great leading thoroughfares at a short distance from each other, but gradually diverging at their western extremity. One of these routes begins in the eastern environs, near Blackwall, proceeds along Whitechapel, Leadenhall Street, Cornhill, Cheapside, Newgate street, Skinner Street, Holborn, and Oxford street. The other may be considered as starting at London Bridge, and passing up King William street into Cheapside, at the end of which it makes a bend round St. Paul's Churchyard, thence proceeds down Ludgate Hill, along Fleet street and the Strand to Charing Cross, where it sends a branch off to the left to Whitehall, and another to the right, called Cockspur Street, which leads forward into Pall-Mall, and sends a shoot up Regent street into Piccadilly, which proceeds westward to Hyde Park Corner. These are the main lines in the metropolis, and are among the first traversed by strangers. It will be observed that the main channels unite in Cheapside, which therefore becomes an excessively crowded thoroughfare, particularly in the early part of the day. The main cross branches in the metropolis are—Farringdon street, leading from the opening to Blackfriars Bridge, at the foot of Ludgate Hill, to Holborn; the Haymarket, leading from Cockspur street; and Regent street, already mentioned. There are several large streets leading northwards from the Holborn and Oxford street line. The principal one, in the east, is St. Martin le Grand and Aldersgate street, which communicates with the great north road. It is a matter of general complaint, that there are so few great channels of communication through London both lengthwise and crosswise; for the inferior streets, independently of their complex bearings, are much too narrow for regular traffic. According to the accounts last taken, the entire metropolis contained 13,936 separate streets, squares, courts, alleys, &c., each with a distinct name. Oxford street, the longest in London, is 2304 yards in length, and numbers 225 houses on each side.

Without particular reference to municipal distinctions, London may be divided into four principal portions—the city, which is the centre, and where the greatest part of the business is conducted; the east end, in which is the port for shipping; the west end, or Westminster, in which are the palaces of the queen and royal family, the houses of Parliament, Westminster Abbey, and the residences of the nobility and gentry; the Surrey division, lying on the south side of the Thames, and containing many manufacturing establishments and dwellings of private families. Besides these, the northern suburbs, which include the once detached villages of Stoke Newington, Islington, Hoxton, St. Pancras, Pentonville, Somer's Town, and Paddington, and consists chiefly of private dwellings for the mercantile and higher classes, may be considered a peculiar and distinct division. It is, however, nowhere possible to say exactly where any one division begins or ends. Throughout the vast compass of the city and suburbs, there is a blending of one division with those contiguous to it. In the business parts there are lines or clusters of neat dwellings, and in the parts devoted to retirement there are seen indications of business. The outskirts on all sides comprise long rows or groups of detached villas, with ornamental flower-plots; and houses of this attractive kind proceed in some directions so far out of town, that there seems no getting beyond them into the country. From the Surrey division there extend southward and westward a great number of these streets of neat private houses, as, for instance, towards Walworth, Kennington, Clapham, Brixton, &c.; and in these directions lie some of the most pleasant spots in the environs of the metropolis. The suburban streets are only macadamized, and possess gravel side paths.

PLACES ON THE THAMES, BELOW LONDON.

The places on the Thames, below London, which are most worthy of the visits of strangers, are Deptford, Greenwich, and Woolwich, the latter being the farthest from town.

Woolwich is a village in Kent, on the south bank of the Thames, eight miles from London by land, and ten following the course of the river. Here, in the reign of Henry VIII., a dockyard for the construction of vessels of the royal navy was established; and, ever since, the place has been distinguished as an arsenal for naval and military stores. From the river a view is obtained of the dockyard and arsenal, now greatly improved. The ground, for nearly a mile in length, is bounded by a stone quay, and surrounded on the land side with various storehouses and workshops. Among these is included a laboratory for the preparation of cartridges, bombs, grenades, and shot. Adjoining are barracks for artillery and marines, military hospitals, &c.: on the upper part of Woolwich Common is situated a royal military academy for the education of young gentlemen designed

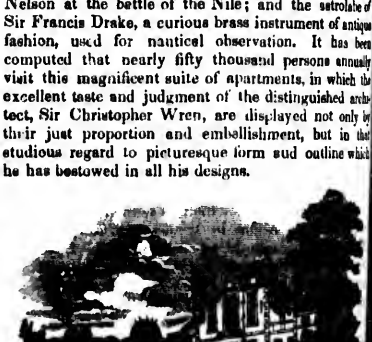
for the army. Strangers are not admitted to the dockyard and arsenal without an order from an officer of the Board of Ordnance. About two miles farther up the Thames, at the head of the reach, is *Blackwall*, on the north bank, with its noble quay for steam-ships. The river now bends sharply to the south, and again returning northwards, encloses like a peninsula, on the north side, a large flat piece of marshy ground called the *Isle of Dogs*. At the southern extremity of this bend of the river stands Greenwich.

Greenwich is a small town, lying on the south bank of the Thames, about six miles below London Bridge, following the windings of the river, but only about four miles by land. To those who do not reach it from Woolwich or any other part down the river, but proceed to it on purpose from London, the most convenient route is by railway from the terminus near the south end of London Bridge, the journey being performed in fifteen or twenty minutes. Small steamers also sail to it from the north end of the bridge every half hour. As a town, Greenwich is of no moment; its hospital and parks are the only objects of attraction to visitors. As you enter its streets, you perceive that it exhibits a seafaring look, and does not resemble the inland places of population in the environs of the capital. Towards its eastern extremity stands the hospital, which faces the Thames, and has a perfect command of all that passes on the river. This superb hospital consists of four edifices, unconnected with each other, but apparently forming an entire structure, lining three sides of an open square, that side on which there is no building being next the water. The whole is built of fine stone, in the best possible style; and along nearly the greater part are lofty colonnades, with handsome pillars, and covered overhead, to protect those underneath from the weather. The square interval in the centre, which is 273 feet wide, is paved also with smooth stone, and ornamented in the middle with a statue of George II., by Rysbrach. Beyond the edifices, on the south, rises the splendid park of Greenwich, dotted with luxuriant tall trees, and crowned at the top with the Royal Observatory buildings.

A portion of these beautiful buildings was originally a palace of Queen Elizabeth, since whose time various renovations and additions have been made, but chiefly in the reign of William and Mary, who, in the year 1694, here established an hospital for invalid seamen, to which purpose the buildings are still exclusively devoted. By the last accounts it contains 2710 pensioners, 168 nurses, with a variety of officers for the government of the house; and gives support to 32,000 out-pensioners. The institution is supported by a payment of sixpence per month from every sailor in the royal navy, by certain dues and donations, and other means. The number of individuals who reside within the walls is nearly 3500. The inmates have a strikingly antique air. They are all old sailors, with countenances well browned by tropical suns, and bleached by the tempests of the ocean; some hobbling on a wooden leg, others with an empty sleeve, a few with only one eye. Their clothes are all of a dark blue colour, of an antiquated fashion. A number wear cocked hats, which add greatly to their supposed antiquity; the boatswains, or other warrant officers, are allowed a yellow trimming or lace to their garments.

There is an air of much contentment, comfort, and peacefulness, in this well-regulated establishment. An abundance of food is allowed, the clothing is warm and comfortable, the accommodations in the house are good, and each man, according to his rank, has from a shilling to half a crown a week, as an allowance for pocket-money. The outer gateway, and the interior parts of this establishment are under the care of the pensioners themselves, who show the utmost attention to strangers, manifesting a politeness and good nature characteristic of the profession of the sailor. Small sums are taken for exhibiting the different places worth seeing, but the money goes to the general fund, or for the board and education of the children of seamen; and the amount tendered by visiters is instantly transferred to the box for its reception.

The chief *lion* of the establishment is the painted hall, which is in the west wing. It consists of a great room and one smaller but equally lofty, leading from its upper end by a flight of steps. A vestibule and flight of steps are between the outer doorway and large room. The appearance of the whole interior on entering is very imposing, the high roof being covered with paintings, as also the farther extremity fronting the entrance; and although these paintings, from exhibiting a mixture of fantastic heathen gods and goddesses with royal and other portraits, are not individually in good taste or of any value, they serve to give a good general effect to the noble apartments they adorn. Along the walls are hung a collection of pictures, partly portraits of celebrated navigators and admirals, and partly depicting distinguished naval victories, each being a present to the institution by some benefactor. A good portrait of Captain Cook, by Dance, presented by Sir Joseph Banks, adorns the vestibule. A number of portraits, by Sir Peter Lely, Dahl, Sir Godfrey Kneller, and others, have been presented by George IV. There are also several by Sir Joshua Reynolds. A little garrulous old sailor, with a single sparkling eye, and a wonderful warmth of devotion to the excellence of the institution, points out the beauties of the various artists, and descants on the extraordinary deception in the perspective of the figures, which he again and again assures the beholder do not stand out from the walls or from the plaster, but are quite flat, and "all as smooth as glass." The painted ceiling of the great room was executed by Sir James Thornhill in 1703, and several subsequent years: from a miscalculation as to the time required for the work, the remuneration fell far short of what it ought to have been. It is related that, in consequence of the length of time he had to lie on his back painting the ceiling, the artist could never afterwards sit upright. In the smaller apartment are shown several models of ships of war, admirably executed in wood; the coat worn by Nelson at the battle of the Nile; and the astrolabe of Sir Francis Drake, a curious brass instrument of antique fashion, used for nautical observation. It has been computed that nearly fifty thousand persons annually visit this magnificent suite of apartments, in which the excellent taste and judgment of the distinguished architect, Sir Christopher Wren, are displayed not only by their just proportion and embellishment, but in that studious regard to picturesque form and outline which he has bestowed in all his designs.



Greenwich Observatory.

The park extending behind the hospital—ever open to the public—comprehends a considerable space

ground, of great natural and artificial beauty. A pathway amidst lines of tall trees leads to a piece of rising ground or mount—quite a hill to a I [illegible]—which, on holidays, generally exhibits a mirthful s[illegible]lads and asses of the humbler classes considering it as a feat to run down the slope without falling or making a stop. On the summit is the Royal Observatory, founded by George III. for the promotion of astronomical science, and the scene of the labours of some men of distinguished ability. An astronomer-royal, supported by the bounty of the crown, constantly resides and pursues investigations in the Observatory. It is scarcely necessary to remind the reader that, from this spot, British geographers measure the longitude in their maps and charts.

Deptford adjoins Greenwich on the west, being only separated from it by a muddy river called Ravensbourne, the mouth of which forms an estuary known as Deptford Creek. Like Woolwich, this place is celebrated for its royal dockyard, commenced also in the reign of Henry VIII. The dockyard, with the victualling department and offices, covers above thirty acres. While Woolwich is now devoted to the preparation and custody of naval and military stores, Deptford is chiefly used for the building of ships; and it possesses wet and dry docks, mast houses, smiths' shops, with about twenty forges for making anchors. From 1000 to 1500 men are usually employed here. The principal depôt, however, for large vessels of war laid up in ordinary, is at Sheerness, near the mouth of the Thames. Peter the Great of Russia, in 1698, studied the art of ship-building at Deptford. In the Thames, near Deptford, may be seen moored the hull of a ninety-eight gun ship, called the Dreadnought, which was dedicated by George III. as a seaman's hospital, and, as is indicated by the inscription on its side, it is open to the reception of sick or disabled seamen of any nation. This noble charity is supported by voluntary contributions.

We now proceed to notice the chief public buildings and objects and places of attraction in and about London, beginning with the Port and places of importance on the Middlesex side of the river.

PUBLIC BUILDINGS, &c., IN LONDON.

The Port.—That part of the river between London Bridge and Blackwall, an interval of several miles, but more particularly the part immediately below the bridge, constitutes the Port, and here are constantly seen lying at anchor great numbers of vessels. As a relief to the river, and for other reasons, there are several very large docks; the lower, and most important, being the East India Docks, which consist of two spacious basins. The next are the West India Docks, the entrances to which are at Blackwall: in these large depôts of shipping connected with the West India trade may at all times be seen some hundreds of vessels, loading or unloading in connection with the warehouses around. The largest of these docks contains thirty acres of water, and is [illegible] feet deep. Farther up the river, and near the [illegible] in the district called Wapping, are the London Docks and St. Katharine's Docks. The London Docks consist of one grand enclosure to the extent of twenty acres, and another of smaller dimensions. These are surrounded by warehouses for the reception of bonded goods, and beneath the warehouses are vaults for bonded liquors. The principal warehouse, entirely devoted to the keeping of tobacco in bond, till it is purchased and the duties are paid, is situated close beside a dock of above an acre in extent, called the Tobacco Dock. The Tobacco Warehouse is the largest covered building in the world; it occupies no less than five acres of ground, and has accommodation for 24,000 hogsheads of tobacco. The sight of this extraordinary warehouse, and of the wine vaults, is calculated to convey the most magnificent conceptions of British commerce. The vaults are arched with brick, and extend in one direction in a continuous line about a mile in length, with diverging lines also of great length, the whole being like the streets of a town under ground. Along the sides are ranged pipes of wine to an amount apparently without limit. There is accommodation for 65,000 pipes. These cellars being dark, all who enter and go through them carry lights. Admission may be had by procuring an order from a wine-merchant to taste and examine any pipes he may have in bond: a cooper accompanies the visiter to pierce the casks. Besides this large vault, which principally contains port, there are other vaults for French wines, &c. The various docks are the property of joint-stock companies, who receive rents and dues of various kinds for their use. At the side of the river adjacent to St. Katharine's Docks, lie large steam-vessels, which sail to and from Edinburgh and other distant ports. Passing the Tower, there is a continuous series of wharfs for shipping and steam-vessels for about a mile to London Bridge, the traffic of the Port being here most dense, and the river at this place being called the Pool. In this chosen seat of commerce, and at a short distance from the bridge, close upon the river, is situated the *Custom-house*. This is an immensely large stone building, which was built in 1814, on the spot occupied by a former custom-house destroyed by fire. The north front, in which is the entrance, is towards a narrow and dirty alley called Lower Thames street. There is nothing worth a moment's notice in or about the building, excepting the long room, in which the chief part of the business is transacted; it measures 190 feet long, 66 feet wide, and 55 feet high. The number of clerks, searchers, and other officers of the establishment, is about two thousand. At wharfs between the Custom-house and the bridge, lie those numerous steam-vessels which ply to Gravesend, Margate, and other places of resort down the Thames, also steamers for continental ports. London, as has been observed, possesses no line of quays on the river. The trade with the ships is carried on at wharfs jutting upon the water. The Thames is placed under strict police regulations with respect to trade; certain places are assigned to different classes of vessels, including those which arrive from Newcastle with coal, and all coasters. The number of ships which arrived from foreign ports in 1837 was 5625, having a burden of 1,064,923 tons; and the number of coasters, including [illegible] vessels, which arrived the same year, was 21,3[illegible] with a burden of 2,911,736 tons. The customs duty collected at the Port in 1834, amounted to the enormous sum of £9,576,972. Of the amount of imports by canals, railways, and roads, there can be no just estimate.

The trade connected with the Port is carried on in the closely constructed part of the town adjacent to the Thames, and backwards to the centre of the city. Almost the whole of this district consists of narrow streets, environed by warehouses and offices, making no external show, but in which an incalculable amount of trade is going on. The offices of many bankers, shipping and insurance companies, are situated hereabouts. Opposite this quarter, on the Surrey side of the river, in equally dense masses, are numerous shipping wharfs, warehouses, porter breweries, and manufactories.

The Tower.—The Tower of London, which forms one of the principal sights of the metropolis, is a cluster of houses, towers, and prison-like edifices, situated in a low and obscure locality, on the north bank of the Thames, and separated from the crowded narrow streets of the city by an open space of ground called Tower-hill. The Tower was founded by William the Conqueror, to secure his authority over the inhabitants of London: but the original fort which he established on the spot was greatly extended by subsequent monarchs; and in the twelfth century it was surrounded by a wet ditch, which

was improved, as it is now seen, in the reign of Charles II. Within the outer wall the ground measures upwards of twelve acres. Next the river there is a broad quay, and on this side also there is a channel by which boats may pass into the main body of the place. This water entrance is known by the name of Traitor's Gate, being that by which state-prisoners are conveyed out in boats to proceed for trial at Westminster. The interior of the Tower is an irregular assemblage of short streets and court-yards, with barracks, houses of keepers, &c. The chief buildings are—the White Tower for prisoners, an ancient chapel, the Ordnance-Office, the Record-Office, the Jewel-Office, the Horse Armoury, the Grand Storehouse, and the Small Armoury. Strangers, on applying at an office at the entrance from Tower-hill, are conducted through the public establishments. The principal objects of curiosity are the immense store of fire-arms, sufficient to equip 150,000 men, and beautifully arranged for show; a collection of cannon, being trophies of war; the horse armoury, being a most interesting collection of suits of mail, on figures; and the crown and other insignia of royalty. Fee for seeing the armoury, 6d.; the regalia, 2s. 6d.

On Tower-hill, facing the Tower, are placed two public establishments—the *Trinity House*, being the office of a corporation whose duty consists in superintending the interests of British shipping; and the *Royal Mint*. The large and elegant building pointed out as the Mint, contains the offices of clerks and other functionaries of the establishment. The buildings in which the coining is performed are situated in the courts behind, and are a series of neat workshops, containing a large steam-engine, as a moving power, melting pots, and machinery for striking the coins. This machinery is exceedingly interesting, and the whole is a model of exactness. Strangers can only be admitted by an order from a superior officer connected with the establishment.

Thames Tunnel.—With the view of affecting a ready communication for wagons and other carriages, and foot passengers, between the Surrey and Middlesex sides of the river, at a point where, from the constant passage of shipping, it would be inconvenient to rear a bridge, a tunnel or free passage beneath was designed and carried into execution by a joint-stock company, which, however, has been largely assisted by government. The tunnel, from a plan of Mr. Brunel, was begun in 1822, at a point about two miles below London Bridge, entering on the southern shore at Rotherhithe, and issuing near the London Docks on the other. After encountering numerous difficulties, including several inundations from above, the work has been brought nearly to a close (January, 1841). The tunnel consists of two distinct avenues or arched vaults, but connected by openings with each other; each avenue being of such height and breadth as to afford a wagon road and footpath. All carriages and passengers going from south to north will take one avenue, and those going the opposite direction will take the other. In its incomplete state, the tunnel is open to visiters, who descend to it by a spiral stair on the Rotherhithe side. When completed, it will be entered by an inclined road at each end.

The Monument.—This is a stone column situated in a small space of ground adjoining the southern extremity of King William street, on the descent to Lower Thames street. It was erected (1677) in commemoration of the great fire of London, which began at the distance of 202 feet eastward from the spot, in 1666; and its height has on that account been made 202 feet. It is a handsome fluted column, designed by Sir Christopher Wren, with a gilt spicular ball on the summit. Visiters are allowed to ascend by a stair to the top, on paying 6d. each. The fabric is now infirm, and its removal has been proposed.

Bridges.—*Old London Bridge* crossed the Thames a little way below the new erection, and was built in 1176, having a considerable rise in the middle, and twenty narrow arches. The new bridge, which is a remarkably fine stone structure, was designed by the late John Rennie, Esq., and opened in 1831; it consists of five arches, that in the middle being 150 feet span, and with a spacious level roadway, connected with the beautiful new thoroughfare, King William street, at the north end, and with the main street of the Borough on the south. The old bridge was removed after the new one was built. On one of the days in August, 1840, it was found, on a careful inquiry, that there passed along King William street, from eight in the morning till eight in the evening, 11,010 carriages, or an average of 970 an hour, or 15 in every minute. On a day of September, in the same year, it was found that there passed during the same space of time, 53,503 foot passengers, averaging 74 per minute.

Southwark Bridge is the next above London Bridge. Its piers are of stone, supporting three arches of immense width; the span of the central arch is 240 feet, or the widest in the world. There are 5308 tons of iron in this bridge. It is the property of a company, who exact a toll from passengers; and from this cause, as well as from having a bad entrance, there is remarkably little traffic upon it.

Blackfriars Bridge, the next in order, was finished in 1769, and consists of nine elliptical arches; the centre one being 100 feet in span, and the entire length 995 feet; the breadth of the carriage-way is 28 feet, with 7 feet of pathway on each side. This bridge rises in the old-fashioned manner; and has been so badly constructed, as recently to require an almost entire renewal of piers; it is now much improved. It is connected with Fleet street, at the foot of Ludgate Hill, by the intermediate thoroughfare called Bridge street, and at its southern extremity it has the long and wide thoroughfare, Blackfriars Road. The river and St. Paul's are best seen from this bridge.

Waterloo Bridge, which is the next above, crosses the river opposite the central part of the Strand. It was finished in 1817, having taken only six years to build. The design was furnished by Mr. G. Dodd, and exceeds in elegance any similar work of art. It consists of nine arches, each of 120 feet span, the whole, including the parapet, built of granite. The roadway at each end is also brought to a level by seconded arches. The length of the bridge, within the abutments, is 1242 feet; width of carriage-road 28 feet, and of each side-path 7 feet. The whole being perfectly level, the bridge may be considered by far the finest in the world. Waterloo Bridge is the property of a company, who exact a toll of 1d. from each passenger; on this account, it is little used as a public thoroughfare.

Westminster Bridge, which crosses the river at a point immediately adjoining Westminster Hall, to Lambeth, is of an old-fashioned structure, with a considerable rise from both ends; it was finished in 1750; extends a length of 1223 feet; is 44 feet wide; and has thirteen large and two smaller arches, of the semi-circular figure; width of middle arch, 76 feet. At the side of the pathways, and rising above the piers, there are recesses, twelve of which are partially covered with cupolas, and these prominent objects give the bridge a peculiar appearance.

Vauxhall Bridge is the most westerly in the series, and crosses the river from a point above Millbank to the thoroughfare adjoining Vauxhall Gardens and Kennington. It consists of nine cast-iron arches resting on stone piers. Standing very much aloof from the lines of general intercourse, and being the property of a company who exact a toll from passengers, it is comparatively little used. In consequence of a considerable bending in the Thames, Vauxhall, Kennington, and other places in that neighbourhood, can be reached by much shorter routes from the centre of the metropolis, by crossing at London or Blackfriars Bridges, than at either the bridges of Westminster or Vauxhall.

Proceeding with our description of public buildings and places of importance in the city, the first we come to in going westward, is the

India House.—This is a large building on the south side of Leadenhall street, erected in 1799, and containing accommodation for the home government of the East Indies. Here there is a grand court-room for the directors of the company, large sale rooms for the disposal of tea and other goods, and offices of various kinds. The chief places of attraction in the establishment are the library and museum, both containing many objects of curiosity from the East. The principal warehouses, which are of immense extent, are in Bishopsgate street. The museum of the India House is open only on Saturday from ten to twelve, *gratis*, all the year except September.

Corn Exchange.—In Mark Lane, a thoroughfare going southwards from Leadenhall street, near the India House, is the Corn Exchange, a large plain building, in which the greater part of the sales of corn take place. Monday is the market-day, on which the greatest bustle prevails.

Royal Exchange.—This building, erected in 1566, and consisting of a handsome quadrangular structure, situated on the north side of Cornhill, was burnt down a few years ago, and upon its site a new Exchange is in course of erection.

Bank of England.—Standing in some measure behind the site of the Royal Exchange, facing Threadneedle street, are seen the extensive series of stone buildings containing the Bank of England. The principal front, seen from the corner of Cornhill, consists of a long line of wall, ornamented with handsome fluted pillars, cornices, and other devices; the windows being blank, the aspect is dead and not by any means pleasing. In the centre is the principal entrance, which conducts to an inner open court, and thence the main building, in which is the telling-office, is reached. Thus far the house is freely open to visiters. The whole buildings and courts include an area of about eight acres, and were completed in 1788. The telling-room shows a scene of extraordinary activity—clerks counting and weighing gold coins, porters going to and fro, and crowds of tradesmen and others negotiating business at the counters. The other and more private parts of the Bank can be seen only by an order from a director. The most interesting departments are the bullion office, in a vaulted chamber beneath, entering from a back court, the treasury, and the apartments in which the notes of the bank are printed. In this latter department there is a large steam-engine, which moves two printing machines, twelve plate presses, and other mechanism—the whole being in the most beautiful order, and forming a most interesting sight. In 1832, there were employed in the Bank, 820 clerks and porters, and 38 printers and engravers; there were besides 193 pensioners. The salaries and pensions amounted to £218,003, the house expenses to £39,187, and the allowance to directors £8000. In a spacious circular chamber, called the Rotunda, which is near the telling-office, a considerable business in the sale of government stock is negotiated. The three per cent. consols office, and dividend office, are fine large apartments adjoining. The hours at which the Bank is open are from nine in the morning till five in the afternoon, holidays excepted.

The most striking view in the interior of the city is at the open central space whence Threadneedle street, Cornhill, King William street, and Cheapside, radiate in different directions. While the corner of the Bank of England bounds this space on the north, it is environed on the south by the

Mansion-House.—This is a tall square mass of dark stone building, with a portico of six Corinthian columns in front, resting on a low rustic basement—the design being heavy and inelegant. This edifice, which projects a considerable length behind, is the official residence of the Lord-mayor of London, provided by the city corporation. Besides an extensive suite of domestic apartments, it contains a number of state-rooms, in which company is received and entertained. The chief of these rooms are the Egyptian Hall, and the ball-room, which have a grand appearance. The annual allowance to the lord-mayor is £8000, and in the Mansion-House he has the use of a superb collection of plate; he is likewise allowed the use of a state coach, &c.

Cheapside.—This great central thoroughfare, which is closely lined with shops of drapers and other tradesmen, is one of the oldest and most respectable streets of the city. On each side narrow streets diverge into the dense mass behind—Ironmonger Lane, King street, Milk street, and Wood street on the north; and among others, Queen street, Bow Lane, and Old 'Change on the south. The greater part of those back streets, with lanes adjoining, are occupied by the offices or warehouses of wholesale dealers in cloths, silks, Manchester goods, articles of Scotch manufacture, paper, &c., and are resorted to by country shopkeepers for supplies. Across the bottom of King street stands

Guildhall, or the townhall of London, where are held meetings of the livery to elect members of parliament, lord-mayor, sheriffs, and others, and where the principal city entertainments are given. The building is old, but received a new Gothic front in 1789. The interior of the grand hall is 153 feet long, 48 feet broad, and 55 feet high; it is one of the largest rooms in London, and can accommodate about 3500 persons at dinner. Two clumsy figures called Gog and Magog, interesting to vulgar curiosity, are placed at the west end of the hall. The apartment is decorated with several historical pictures and monuments. Adjoining are various offices for city courts.

Bow Church, or, more correctly, the church of St. Mary-le-Bow, occupies a conspicuous situation on the south side of Cheapside, and possesses a spire of great elegance, designed by the famous architect, Sir Christopher Wren. The clock projects over the street from the lower part of the tower. Standing in the centre of the city, those who are born within the sound of its bells are jocularly called *Cockneys*, a name equivalent to genuine citizens. The consecration of the bishops of London takes place in Bow Church.

At the western extremity of Cheapside is a dense clump of building, in which is Paternoster Row; on the right or north is St. Martin le Grand, a street in which is the Post-Office; and on the left is St. Paul's Churchyard.

Post-Office.—This is the grandest of all the public buildings of London, not reckoning those of an ecclesiastical order. In comparison with its lofty central portico, all other columnar structures in the metropolis seem insignificant. The whole edifice is of stone, and measures 389 feet in length; and the three porticoes with which it is adorned are of the Ionic order. Beneath the central portico is the entrance to a spacious hall (80 feet long, 60 feet wide, and 53 feet high), having also an entrance at the opposite extremity; and on both sides are the various windows or wickets for receiving letters designed for the foreign, inland, or town post, &c. The upper stories in the building contain sleeping apartments for numerous clerks belonging to the foreign post-office, and servants. The building is enclosed by railing, and at the north end is a courtyard in which mail-coaches range up and depart with their load of bags every evening at eight o'clock. From six to seven o'clock in the evening a prodigious bustle prevails in putting letters into the Post-Office; and on Saturday evening, when the Sunday newspapers are posted, it exceeds all description. The spectacle afforded at that time is one of the most interesting sights of London. Immediately behind the Post-Office stands Goldsmiths' Hall, a new and very elegant building

of Grecian architecture, and of large dimensions, but lost to view in this unhappily confined situation.

St. Paul's.—St. Paul's Church, the most prominent object in London, and whose lofty dome towers in majesty over the mean rows of brick houses which environ it, stands in the centre of an enclosed churchyard of limited dimensions, at the head of Ludgate Hill street. A church was planted here four hundred years before the Norman Conquest, and, under various shapes and extensions, it remained till destroyed by the great fire in London, in 1666. An entirely new edifice was then erected in its stead, the important work being committed to Sir Christopher Wren. It is built in the form of a Greek cross, and measures 514 feet in length, 286 in breadth, and 370 in height, to the topmost pinnacle. Outwardly, the walls, which have a dark sooty appearance, except where bleached with the rains, exhibit a double range of windows. There are three porticoes at as many entrances, on the north, west, and south. That on the west is the principal, with twelve lofty Corinthian pillars below, and the angles above crowned with handsome bell towers, the size of ordinary church towers or steeples. But this entrance, which fronts the street called Ludgate Hill, is apparently disused, and the common entrance is by the north portico and flight of steps. On entering, the impression produced by the vastness of the internal space is very great, although the walls entirely want those decorations which give St. Peter's and many less remarkable continental churches so much beauty and interest. The only objects designed to please in detail are the statues and sepulchral monuments ranged along the sides of the aisles. The revenues of St. Paul's are considerable, and support several prebendaries and other functionaries, the institution being a collegiate church. Prayers are read every morning and afternoon. Through some fine open screenwork, a view is obtained of the place where the usual services are performed, and which is highly decorated with dark oaken carved work. If the stranger pleases, he may mount by means of stairs and ladders to the top of the cupola; and though he be taxed in a small sum at the different stages, he will be amply repaid by the extensive view from the balcony or gallery, which comprehends the whole of London, with the country beyond its outskirts, and the Thames rolling placidly in its winding course through the dense mass of houses. Altogether, St. Paul's is a magnificent structure, and though it cost a million and a half of money in the erection—and that was a great sum in the seventeenth century—the price was well spent by the nation on so worthy an object. The clock-work and great bell of St. Paul's always attracts the notice of visiters. The pendulum measures fourteen feet in length, while the mass at its extremity is one hundred-weight. The great bell, which is only rung when a member of the royal family dies, is placed in the southern turret above the western portico, and weighs four and a half tons, and is ten feet in diameter. The fine deep tones of this mighty bell, on which the hours are struck, sweep solemnly in a quiet evening across the metropolis, and are heard distinctly by families at their firesides, several miles distant. In the immediate vicinity of St. Paul's, the town has a retired, cloistered appearance, the names of the very streets and lanes giving token of their former connection with the religious structure and its clerical attendants. The enclosed churchyard is surrounded by a street, not of the broadest dimensions, closely hemmed in with houses, now chiefly dedicated to trade, the lower stories being, as usual, shops. An open arched passage on the south side of the churchyard leads to Doctors' Commons, or the offices connected with the ecclesiastical courts. St. Paul's is open each week-day from 9 to 11, and from 3 to 4; and on Sunday from 10 to 12, and from 3 to 5. An authorized tariff of fees is exhibited at the door.

Paternoster Row is a continuation of Cheapside, but is not used as a thoroughfare, though it communicates by transverse alleys or courts with the Churchyard, and, at its western extremity, by means of another cross alley, called Ave-Maria Lane, leads into Ludgate Hill. Paternoster Row, or "the Row," as it is familiarly termed, is a dull street, hardly wide enough to permit two carriages to pass each other, with a narrow pavement for a single rank and file on each side, and a gutter in the middle. The houses are tall and sombre in their aspect, and the shops below have a dead look, in comparison with those in the more animated streets. From a very remote period, this alley has been the seat of booksellers and publishers, who, till the present day, continue in such numbers as to leave little room for other tradesmen. At the western extremity of Paternoster Row, a passage leads from Amen Corner to Stationers' Court, in which is situated Stationer's Hall, and also several publishing houses.

Christ Church Hospital, or the *Blue Coat School*, as it is commonly called from the colour of the boys' dress, is situated within an enclosure on the north side of Newgate street, and is one of the most splendid among the charitable foundations of London. The buildings stand on the site of a monastery of Grayfriars, which was granted by Henry VIII. to the city for the use of the poor; and his son and successor Edward VI. greatly extended the value of the gift, by signing a charter for its foundation as a charity school, and at the same time endowing it with sundry benefactions. The hospital was opened for the reception and education of boys in 1552. Charles II. added an endowment for a mathematical class, and with various augmentations of endowment, the annual revenue is, we believe, about £40,000. This income supports and educates nearly 1200 children, 500 of whom, including females, are boarded at the town of Hertford for the sake of country air. The management of the institution is vested in a body of governors, composed of the lord-mayor and aldermen, twelve common-councilmen chosen by lot, and all benefactors to the amount of £400 and upwards. The children are admitted without reference to the city privileges of parents; about one hundred and fifty are entered annually. After instruction in the elementary branches of education, the greater number leave the seminary at the age of fifteen, those only remaining longer who intend to proceed to the university, or to go to sea after completing a course of mathematics. There are seven presentations at Cambridge, and one at Oxford, open to the scholars. The buildings of the institution embrace several structures of large dimensions, chiefly ranged round open courts, with cloisters beneath, and a church, which also serves as a parochial place of worship. The only part of the establishment worth examining for its architecture or size is the great hall, occupying the first floor of a building of modern date, and in the Gothic style. It measures 187 feet long, 51 feet broad, and 47 feet high, and possesses a small gallery at each end. In this magnificent apartment, the boys breakfast, dine, and sup, under the direction of female *governantes*. Before meals, one of the elder inmates, from a pulpit, says a long grace or prayer, at the commencement of which the whole of the boys, in lines at their respective tables, fall on their knees, and present a striking spectacle. Each boy is dressed in the pauper costume of Edward VI.'s reign; the garment consisting of a long dark-blue coat, breeches, and yellow worsted stockings. They are also provided with woollen caps, but these are so small and flat as to be rather for show than use.

Newgate.—At the western extremity of Newgate street, and fronting the Old Bailey, a street which crosses to Ludgate Hill, stands Newgate, the general criminal prison for the city and county. The exterior presents high dark stone walls, without windows, save with entrances from the side next to the Old Bailey, a

ons ! which public executions take place. The earliest prison here was in the portal of the *new gate* of the city, as early as the thirteenth century, and hence the name. The present modern edifice was in course of erection in 1780, when it was partially destroyed by the riots of that year; and it has since been greatly extended, one of its improvements being the exclusion of debtors, who are now confined in a jail in Whitecross street, and a still greater improvement being the classification of prisoners in wards. The establishment is kept in the cleanest possible condition, and is otherwise managed with great care and humanity. The cells for condemned prisoners are at the north-east corner, next to Newgate street. Strangers are admitted to inspect the prisons by an order from one of the sheriffs or other competent city authorities. In buildings adjoining the prison are held the Central and other criminal courts. At the head of Snow Hill, and nearly opposite Newgate, stands St. Sepulchre's Church, the sounding of whose bell has admonished many an unhappy wretch of the approaching hour of execution.

Temple-Bar, &c.—The boundary of the city, at the western termination of Fleet street, is marked by Temple-Bar, consisting of a wide central archway, and a smaller archway at each side for foot passengers. There are doors in the main passage which can be shut at pleasure, but practically they are never closed except on the occasion of some state ceremonial, when the lord-mayor affects an act of grace in opening them to royalty. The structure, which was designed by Sir Christopher Wren, and erected in 1672, must now be considered as a serious obstruction to the living stream passing below. The neighbourhood of Temple-Bar, on the city side, is much occupied by offices, halls, and residences of lawyers and law-students. In or near Chancery Lane, northward from Fleet street, are situated Serjeant's Inn, Lincoln's Inn, Clifford's Inn, &c., while Gray's Inn and Furnival's Inn are situated on the north side of Holborn. These and other *Inns of Court*, as they are termed, are large establishments, with apartments for the residence of law students, who, however, do not attend classes, but only rent rooms and pay for their dinners. After residing and paying at an ordinary for a certain length of time in these places, young men are considered qualified to be called to the bar. At the foot of a lane near Temple-Bar, on the south side of Fleet street, is a most extensive series of buildings, composing several squares and rows, called the Temple, and being the place of residence of the members of two societies, the Inner and Middle Temple, consisting of benchers, barristers, and students. The establishments possess a neatly trimmed garden, adjoining the river. In the cluster of buildings lying east from the Temple, once existed the sanctuary of Whitefriars, or *Alsatia*, as it was sometimes called, a description of which is given by Scott in the "Fortunes of Nigel." The streets here are still narrow and of an inferior order, but all appearance of Alsatians and their pranks is gone.

Strand.—The Strand is the long but somewhat irregularly built street in continuation westward from Temple-Bar, the thoroughfare being greatly incommoded by two churches, which, at a distance from each other, stand in the very middle of the way. In the seventeenth century, the Strand was a species of country road, connecting the city with Westminster, and on its southern side stood a number of noblemen's residences, with gardens towards the river. The grandest of these mansions was a palace, which had been erected in 1549 by the Duke of Somerset, Protector during a part of the minority of Edward VI.; on whose attainder it became crown property and a royal residence. The edifice was entirely removed in the reign of George III., and on the spot was erected, from designs of Sir William Chambers, about the year 1780, that magnificent quadrangular structure called *Somerset House*, which is devoted to the accommodation of various government offices. This noble stone building has its main front towards the Strand, while on the rear it presents an almost equally elegant façade to the Thames, which it closely overhangs. In the middle of the Strand front is the principal entrance, consisting of three open archways, leading into a spacious quadrangular court in the centre. The lines of buildings around as may be observed from inscriptions over the doorways contain the Navy Pay-Office, Stamp-Office, &c.; and in a brick building behind, at the north-western angle, is the office of the Poor-Law Commission. In the central part of the north line of building, near the river, is the suite of apartments devoted to various matters connected with the royal navy, and including a museum of models of ships, &c. Adjoining Somerset House on the east, and entering by a passage from the Strand, is a range of rather plain but massive brick buildings, lately erected for the accommodation of *King's College*. The Strand contains no other public structure of importance, but has some elegant stuccoed buildings at the western extremity, on the northern side; opposite, and overlooking Charing Cross, is the large mansion of the Duke of Northumberland, distinguished by the figure of a lion, the family crest, on the summit.

Charing Cross.—The open space called Charing Cross is marked by a figure on horseback of Charles I., and the name of the locality is derived from the ancient village of Charing, which once stood upon the spot. On the north side is an open quadrangular space, formed by the clearing away of buildings, now called Trafalgar Square, and in the centre of which a pillar is erecting in commemoration of Lord Nelson. At the north-east angle stands *St. Martin's Church*, whose portico, by James Gibbs (1721), is reckoned the most elegant of its kind in the metropolis, or perhaps in the world. Adjacent, closing the northern side of the square, has been lately erected, at an expense of £62,000 voted by Parliament, a building containing the *National Gallery* of Pictures. Mr. Wilkins was the architect. It is in the Grecian style, but so long and so deficient in height or grandeur, as to be contemptible as a work of art. The National Gallery, which is freely open to the public, consists chiefly of a collection of pictures, purchased for £50,000 from the heirs of the late Mr. Angerstein. The Royal Academy has apartments in the eastern division of the building, for its exhibitions of pictures. The National Gallery is open on Monday, Tuesday, Wednesday, and Thursday, and the whole of Easter and Whitsun weeks, except Saturday, from ten till five; but is closed for six weeks from the end of the second week in September.

Whitehall.—Whitehall street, which runs in a southern direction from Charing Cross, is a long and spacious thoroughfare leading to Parliament street, which terminates in Palace Yard, where the Houses of Parliament are situated. On the western side of Whitehall street, and nearly throughout its length, stands a series of large buildings, in various styles of architecture, and used as government offices. The first in the series, on our right going southward, is the Admiralty, which may be known by the telegraph on its roof; next is the Horse Guards, where the business of the army is transacted, and which is outwardly distinguished by two mounted guards at the gateway, and an entrance leading to St. James's Park behind; next is the Treasury; and, lastly, the Board of Trade, and office of the Privy-Council. A short street or place, leading from the corner of the building, and called Downing street, contains the official residences of the first lord of the treasury, the chancellor of the exchequer, the offices of the foreign and colonial secretaries of state, &c. On the eastern side of Whitehall street, and opposite the Horse Guards, stands a tall square massive edifice, of handsome architecture, designed by Inigo Jones, and built, at the order of James I., to serve as a ban

queting house to his adjoining palace of Whitehall. The palace, which reached to the river, was accidentally burnt down in 1695, when St. James's Palace, in St. James's Park, was erected, leaving the Banqueting House to remain as an edifice for any public purpose. The great hall is now used as a chapel; its roof is ornamented by a painting by Rubens, representing the apotheosis of James I. The Banqueting House derives a melancholy interest, from having been the scene of the execution of Charles I., who, on the 30th of January, 1648-9, passed from an open window to a scaffold in front, where he was beheaded in the presence of an immense concourse of spectators.

Westminster Hall—Houses of Parliament.—On the south side of Palace Yard, stands a somewhat confused cluster of buildings of ancient and modern date, comprising a central and beautiful old Gothic fabric, called Westminster Hall, some parasitic edifices devoted as offices for courts of law, and other structures, being the re-edified wrecks of the houses of Parliament, burnt down a few years ago. Westminster Hall, which has its end exposed to Palace Yard, was built by William Rufus, in the years 1097-8, and may be said to resemble the body of a church; the interior is of extraordinary dimensions, being 270 feet long, 74 broad, and 90 high; and the roof, consisting of ancient oak-work, has an air of solemn grandeur. The floor is open, for the free walking to and fro of lawyers, members of the House of Commons, and others. The present House of Commons and House of Lords are neat and commodious; but being only for temporary use, till a splendid edifice is erected for their accommodation nearer to the river, nothing further need be said of their appearance. Strangers will find admittance to the gallery of the House of Commons during the sittings, either by an order from a member, or by paying a fee of half-a-crown to the door-keeper in attendance. Admission to a space without the bar of the House of Lords may be procured in a similar manner. During the recess, admission is had to all parts of the two houses, by applying to the porters in attendance.

Westminster Abbey.—Nearly opposite the houses of Parliament stands Westminster Abbey, open to inspection on the north and east, but much crowded upon by paltry dwelling-houses on the west. In very early times, this spot of ground was a small insular tract, surrounded by the waters of the Thames, and called Thorney Island. Here a monastic institution was founded on the introduction of Christianity into Britain. Under Edward the Confessor, an abbey was raised upon the site of the ruined monastic building. The ground plan, as usual, bore the form of the cross; rights and endowments were granted, and the edifice assumed a great degree of architectural grandeur. It had become the place for the inauguration of the English monarchs, and William the Conqueror was crowned here with great pomp and solemnity, in 1066. Henry III. enlarged the abbey, and the building continued in the state in which he left it until Henry VII. added a chapel, built in the florid Gothic style, on which the greatest skill of the architect and the sculptor was displayed; exhibiting the most splendid structure of the age, and so highly esteemed, that it was enjoined that the remains of royalty alone should be interred within its walls. During the reign of Henry VIII. the abbey was considerably defaced, but on the surrender of its revenues, Henry raised Westminster to the dignity of a city, and its abbey was constituted a cathedral. It was, however, afterwards reunited to London in 1550. Westminster Abbey, during the reign of William and Mary, was thoroughly repaired, and the towers added at the western entrance, under the direction of the celebrated Sir Christopher Wren, to whom London owes so much of its architectural grandeur.

Westminster Abbey.

The length of the abbey is 416 feet; breadth at the transept, 203 feet; nave, 102 feet; height of the west towers, 226 feet. The exterior measurement, including Henry VII.'s Chapel, is 530 feet.

On entering at the great western door between the towers, the magnificence of the abbey at once strikes the beholder with reverential awe: nearly the whole of the interior appears in grand masses of towering Gothic columns of gray marble, connecting the pavement with the roof, and separating the nave from the side aisles. A screen divides the nave from the choir, which is surmounted by a noble organ, while beyond, the eye soars amid graceful columns, tracery, and decorated windows, to the summit of the eastern arch that overlooks the adjacent chapels. The walls on either side display a great profusion of sepulchral monuments, among which are many finely executed pieces of sculpture, and touching memorials of those whose exploits or exertions deserved the notice of posterity.

Above the line of tombs there are chambers and galleries, once occupied by nuns, but now solemn and dreary in their antiquity, though relieved by the sunbeam glancing across the misty height of the nave. The northern window is richly ornamented with stained glass, representing the Holy Scriptures surrounded by a band of cherubim, in the centre; on the sides, the Saviour, the Evangelists, and Apostles, appear in recumbent attitudes. From this window proceeds a calm ray of light, very advantageous to the display of the beautiful sculpture on which it falls. There are numerous tombs and monuments of noble persons, exquisitely imagined and executed, in emblematical groups or in faithful portraiture, presenting to the spectator subject for deep reflection.

The Chapel of Edward the Confessor is at the eastern end of the choir, and contains the shrine of St. Edward; that it was an exquisite piece of workmanship is evident even in its decay. Here also is the coronation-chair, under which is placed the celebrated stone brought from Scone in Scotland by Edward I., in 1297. The Chapel of Henry VII. is also at the eastern end of Westminster Abbey; and among the ashes of many whose brows were decorated with diadems, are those of Mary and Elizabeth. The ascent to this splendid piece of Gothic art, which has been extolled as the wonder of the world, is by steps of black marble beneath a stately portico. The entrance gates display workmanship of extraordinary richness in brass. The effect produced on entering the chapel is solemn and elevating: the lofty ceiling is wrought in stone into an astonishing variety of figures and devices; the stalls are of oak, having the deep tone of age, with Gothic canopies, all elaborately carved. Here are installed the knights of the most honourable Order of the Bath. In their stalls are placed brass plates of their arms, and above are suspended their banners, swords, and helmets; beneath the stalls are seats for the esquires. The pavement is composed of black

and white marble, beneath which is the royal vault. The magnificent tomb of Henry VII. and Elizabeth his queen, stands in the body of this chapel, in a curious chantry of cast brass, most admirably executed, and interspersed with effigies, armorial bearings, and devices, alluding to the union of the red and white roses.

Westminster Abbey is a collegiate church, with a dean and chapter, who possesses a considerable authority over the adjoining district. The abbey may be considered as subdivided into nine chapels; but in the present day divine service is performed only in a space enclosed with wood, near the eastern extremity of the building. It takes place daily at ten in the morning and three in the afternoon, though sometimes none are present but the officials. The public worship of the parish is conducted in the adjacent church of St. Margaret.

The abbey is usually entered by a side door at Poet's corner, which is nearly opposite the House of Lords. Here strangers will find admittance daily, and be conducted through the building on payment of certain fees.

Penitentiary.—Beyond Westminster Abbey in a southerly direction, there is no public building or institution requiring notice, except the Penitentiary at Millbank, near the extremity of Vauxhall Bridge. This great establishment for the confinement and reformation of offenders of secondary turpitude, occupies a very low situation near the Thames, and the external wall includes eighteen acres of ground. The plan of the building, or buildings, is that of a hexagon, with six interior courts, and a building in the centre. The cost of building it was between £400,000 and £500,000, and it is calculated to accommodate 400 male and 400 female convicts. Latterly, the silent and separate system have been adopted in the prison, under particular regulations.

THE PARKS, ROYAL PALACES, &c.

The Parks, which form one of the most beautiful features of the metropolis, are situated chiefly in a series from the back of Whitehall street, in a westerly and southerly direction, and are thus blended with the fashionable end of the town. The most ancient of these open grounds is

St. James's Park, so called from St. James's Palace, which partly bounds it on the north. Originally these grounds were a marshy waste, which was drained and otherwise improved by Henry VIII., who also took down an ancient hospital dedicated to St. James, and built on the site the palace now called St. James's. Charles II. improved the grounds by planting the avenues of lime-trees on the north and south sides of the park, and forming the Mall, which was a hallowed, smooth, gravelled space, half a mile long, skirted with a wooden border, for playing at balls. The southern avenue was appropriated to aviaries: hence it derived the appellation Birdcage Walk. The centre of the park was occupied by canals and ponds for aquatic birds. William III. threw the park open to the public for their recreation. It is nearly a mile and a half in circumference, and the avenues form delightful **shady promenades**. In the centre is a fine piece of water, interspersed with islands, and covered with swans and various water-fowl. On each side are spacious lawns, dotted with lofty trees and flowering shrubs. The lawns are separated from the avenues by iron railings, and at each entrance is a keeper's lodge. There are seven or eight entrances to the park, the king's guard doing duty at each, day and night. At the east side of St. James's Park is a large gravelled space called the Parade, on which, about ten o'clock every morning, the body-guards required for the day are mustered—about seven or eight hundred men; and here the regimental bands perform every morning between ten and eleven o'clock. At the south side of the parade is placed a huge mortar, brought from Spain; and at the north end is a piece of Turkish ordnance, of great length, brought from Alexandria, in Egypt. A little farther north from the parade, is a broad flight of steps, giving entrance to the park from Waterloo Place, constructed by order of William IV.; these steps are surmounted by a lofty column, commemorative of the late Duke of York, which occupies the spot where lately stood Carlton Palace, the favourite residence of George IV. while Prince Regent. The buildings near this, which overlook the park, are lofty and elegant. Farther along the Mall, or avenue, is St. James's Palace, an irregular brick structure, having its front towards Pall-Mall. The interior consists of several spacious levée and drawing rooms, besides other state and domestic apartments. This palace is only used occasionally by the queen, the principal royal residence being now

Buckingham Palace.—This edifice stands at the west end of the Mall in St. James's Park, in a situation much too low in reference to the adjacent grounds on the north. The site was chosen by George IV., and the structure rose under the care of Mr. Nash, architect; when completed, after various capricious alterations, about 1831–2, it is said to have cost about £700,000. The edifice is of stone, with a grand centre, and a wing of similar architecture projecting on each side, forming an open court in front; on the extremities are colonnades, giving a noble expanse to the building. The basement is of the Doric, and the superior part of the building of the Corinthian order; the summits are adorned with statues. The interior contains many beautiful and magnificent apartments, both for state and domestic purposes; but so ill has the plan been conceived, that in a number of the passages lamps require to be kept lighted during the day. In the front of the palace is the Waterloo triumphal arch, which forms an entry to the palace.

The Green Park rises with a gentle slope to the north of Buckingham Palace, and is bounded on the east side by many fine mansions of the nobility. In a north-westerly direction from the palace is a broad road called Constitution Hill, connecting St. James's Park with Hyde Park Corner. On the north is the line of terrace-like street, forming the western extremity of Piccadilly. The whole of the Green Park is surrounded by iron railings, and is interesting from its unequal grassy surface, which rises considerably on the north side. From the highest ground there is a pleasing prospect of Buckingham Palace, and of St. James's Park with its ornamental grounds and avenues of tall trees, over which Westminster Abbey majestically rises, accompanied by the Gothic turrets of other buildings. At the north-west angle of the park, and head of Constitution Hill, where Piccadilly terminates, there is a triumphal arch of the reign of George IV., elaborately decorated, but possessing little general effect. Across the way is the handsome entrance to Hyde Park: and here in the after part of the day in fine weather, may be seen an extraordinary concourse of foot passengers, vehicles, and gentlemen on horseback, going to and returning from Hyde Park; also the general traffic between Piccadilly and Kensington, Brompton, and other places in a westerly direction.

Hyde Park is part of the ancient manor of Hida, which belonged to the monastery of St. Peter, at Westminster, till Henry VIII. appropriated it differently. Its extent is about 400 acres, part of which is considerably elevated. The whole is intersected with noble roads, lawns with luxuriant trees, planted singly or in groups, presenting beautiful examples of diversified prospects. At the south-east corner, the entrance from Piccadilly, on an elevated pedestal, stands a colossal and dark statue of Achilles, cast from the cannon taken at the battles of Salamanca and Waterloo, weighing thirty tons, and "erected to the Duke of Wellington and his companions in arms, by their countrywomen."

The long sheet of water called the Serpentine River enriches the scenery of Hyde Park. At its western ex

tremity is a stone bridge of five large and two smaller arches, erected in 1826, giving access to the gardens of Kensington Palace. On the level space of Hyde Park, troops of the line are occasionally reviewed. The great road through the Park to Kensington is denominated Rotten Row, and is a fashionable resort for equestrians wherein to show off their high-bred horses. Other roads display countless elegant equipages of the nobility, gentry, and others; while the footpaths, which are railed off from the roads, are crowded with the well-dressed inhabitants of London, enjoying the salubrity of the air and the gayety of the scene, more particularly between two and five on a Sunday afternoon. There are five entrances open from early morning till nine at night. No stage or hackney coaches are permitted within the gates of Hyde Park.

Kensington Gardens.—At the western extremity of Hyde Park lie Kensington Gardens, a large piece of ground laid out in the ornamental park style, interspersed with walks, and ornamented with rows and clumps of tall trees. Besides an entrance from Hyde Park, there is an entrance from the Knightsbridge road, or continuation of Piccadilly. The grounds are open daily to all respectably dressed persons. Near the west end of the grounds stands Kensington Palace, a large red brick building, and which serves as a residence for members of the royal family. It was purchased from Lord Chancellor Finch, and greatly improved, by William III., since whose time the gardens adjoining have been considerably extended, so that they now measure about two and a half miles in circumference. These grounds form a most delightful public lounge during fine weather.

Regent's Park is situated considerably apart from the other parks, in a northerly direction from the preceding grounds, and consists of a circular enclosure of about 450 acres, which are laid out on the most approved principles of what is called landscape gardening; its centre is enriched with lakes, plantations, shrubberies, and eight beautiful villas. The park is surrounded by extensive ranges of buildings, forming splendid terraces, variously designated, and all decorated with sculpture in agreement with their respective orders of architecture; producing an effect of beauty and grandeur rarely witnessed. At the south end of the park, the *Colosseum* stands conspicuous, with its immense Doric portico and circular roof, rising from a polygon of sixteen faces, occupying an area of 400 feet The main design of this large structure is to exhibit a panel of panoramic view of London, and this is accomplished with surprising fidelity and effect. The representation is exhibited as seen from the top of St. Paul's, and to gain this imaginary height, the visiter mounts a central tower. Besides this view of London, there are several conservatories and other sights connected with the Colosseum, all of which are exceedingly worthy of being visited. On the border of the Park is the celebrated exhibition called the *Diorama*, which consists of painted representations of landscapes or buildings; on particular parts of the scene, illuminations of different hues are so judiciously cast, as to produce a perfect resemblance to nature.

Zoological Gardens.—At the northern extremity of the Regent's Park are the Zoological Gardens, the property of the Zoological Society, and established in 1826. These gardens are very extensive, and being removed from the dingy atmosphere, noise, and bustle, of London, they present an agreeable and truly country-like aspect. The grounds have been disposed in the style of landscape-gardening—here a clump of shrubby trees and border of flowers, indigenous and exotic; there a pretty miniature lake; and at proper intervals is seen a neat rustic cot, with its straw-thatched roof and honeysuckled porch. Much of the ground, also, is occupied as green meadows, either subdivided into small parks for deer and other quadrupeds, or dotted with movable trellis houses, the abodes of different kinds of birds which require the refreshing exercise of walking on the green turf. Throughout the whole, neat gravel walks wind their serpentine course, and conduct the visiter to the bear-pit, monkey-house, aviaries, and other departments of the establishment. The gardens are open every week-day for the admission of visiters, who must previously procure an order from a member of the society, and likewise pay a shilling each at the gate.

The West End.—Returning up Whitehall street to Charing Cross, the stranger may pursue his tour through Cockspur street to Pall-Mall, and thence proceed up Regent street. As he enters this new line of route, he will perceive that the buildings assume an exceedingly imposing aspect. They are for the most part covered with a composition to resemble stone, and being in some instances painted, they have a light and cheerful appearance. At the foot of Regent street is the short broad thoroughfare of Waterloo Place, lined with noble mansions, and leading southwards to St. James's Park. Here stands the elegant column dedicated to the late Duke of York. From this point, for about a mile in a northerly direction, is the line of Waterloo Place and Regent street, forming the handsomest street in London. At a point a short way up, we cross Piccadilly, and enter a curve in the thoroughfare, called the Quadrant; the fronts of the houses are here lined with arcades and pillars, so as to form a covered path on each side of the way. At the corners of the Quadrant, and also in Upper Regent street, there are now some of the most splendid shops in London, several being decorated in a style of extraordinary magnificence. Regent street, during the busy season in May and June, and during the day from one till four o'clock, exhibits an extraordinary concourse of fashionable vehicles, gentlemen on horseback, and foot passengers; while groups of carriages are drawn up at the doors of the more elegant shops. Towards its upper extremity, Regent street crosses Oxford street: and the mass of streets west from it, throughout its entire length, may be said to include the residences of the greater part of the nobility and other high classes of London. In this quarter are Old and New Bond streets, Hanover, Berkeley, Grosvenor, Cavendish, and Portman squares (the two latter north of Oxford street); and in connection with these squares there are long quiet streets, lined with houses suited for an affluent order of inhabitants. In and north from Oxford street, and in its eastern continuation, Holborn, there are few public buildings deserving particular attention: the only institution of general importance north from Holborn is the

British Museum.—This is a great national establishment (the property of the public), containing a vast collection of books, prints, antiquities, and natural curiosities. It occupies a most extensive suite of buildings in Great Russel street, Bloomsbury. Since its commencement in 1755, the collection has been prodigiously increased by gifts, bequests, and purchases, and now it is perhaps the largest of the kind in the world. The library is open only to persons who proceed thither for study or for consulting authorities, no general inspection by strangers being allowed. The portions open to ordinary visiters consist of an extensive series of large apartments on the ground and upper floors, each devoted to the exhibition of a distinct class of objects. Among others are the following:—Room 1, Terracottas; 2, 3, 4, and 5, Greek and Roman sculptures; 5, Roman sepulchral antiquities, and Sir T. Lawrence's collection of casts; 7, British antiquities; 8, Egyptian antiquities; 9, Portland Vase; and several saloons containing the Elgin Marbles, and massive Egyptian antiquities. The rooms containing objects in natural history and artificial curiosities, are handsomely fitted up with glass-cases on the walls and counters. The most deeply interesting collec-

tion in the whole establishment is that of Egyptian antiquities—consisting of smaller objects, including mummies in cases, on the upper floor, and huge remains in stone in the saloons below. Days may be spent in examining this vast assemblage of objects; and to assist in the inspection, catalogues for the entire museum may be purchased at the door.

The British Museum is open from October to April on Mondays, Wednesdays, and Fridays, and the whole of Easter and Whitsun weeks, except Saturday, from 10 till 4; from May to September, 10 till 7. It is closed on the first week in January, May, and September, and on Christmas-day, Good Friday, and Ash Wednesday. No fee whatever is payable.

PLACES OF INTEREST NEAR LONDON.

The chief places of an interesting kind near London are Woolwich, Greenwich, and Deptford, already mentioned, on the east; Dulwich on the south; and Chelsea, Richmond, Hampton Court, and Windsor, on the south-west.

Dulwich is a pretty village, lying within the extended suburbs of the metropolis, in Surry, in a southerly direction from London Bridge. Here Edward Alleyn, or Allen, a distinguished actor in the reign of James I., founded and endowed an hospital or college, for the residence and support of poor persons, under certain limitations. The foundor bequeathed some pictures to the Institution, and the collection was vastly increased by the addition of a large number bequeathed in 1810, by Sir Francis Bourgeois. A splendid new gallery was opened in 1817; and this now forms a most attractive sight to all who delight in the fine arts. The gallery is open every forenoon, except on Fridays and Sundays. Tickets to view it may be had *gratis* from Colnaghi, Pall Mall, and other printsellers.

Chelsea.—Chelsea is a village on the west of the Metropolis. It is only eminent for its hospital for retired invalid soldiers, an institution similar in all respects to the asylum for decayed sailors at Greenwich. The hospital, which is situated on a flat stretch of ground between the village and the Thames, and was planned by Sir Christopher Wren, consists chiefly of one large edifice of red brick, several stories in height, forming a centre and two wings, or three sides of a square, with the open side towards the bank of the Thames. On the north, in which is the main entrance, the style of architecture is simple, being ornamented with only a plain portico. The inner part of the centre building is more decorated, there being here a piazza of good proportions, forming a sheltered walk for the veteran inmates. In the centre of the open square interval stands a statue of Charles II., in whose time the hospital took its rise. The only parts of the house considered worthy to be shown to strangers are the chapel and old dining hall, both in the central building. The chapel is neat and plain in appearance, the rows of benches being furnished with prayer-books and hassocks, and the floor being paved with marble in alternate black and white squares. Above the communion-table there is a painting of the Ascension, containing some good figures. The dining-hall is equally spacious, but is now disused as a refectory, though the tables stand ready covered for use.

The usual number of in-pensioners is about 476, and of out-pensioners not fewer than 80,000, who reside in all parts of the United Kingdom. The former are provided with all the necessaries, and the latter have each pensions varying from £7, 12s. to £54, 15s. yearly. The inmates wear an antique garb of red cloth, in which they may be seen loitering about the village.

Near Sloane Square, Chelsea, is situated a large building forming the *Royal Military Asylum*, for the support and education of about 500 poor children, whose parents were non-commissioned officers and privates in the army. Each regiment contributes annually one day's pay, to aid in supporting the institution.

Richmond.—Richmond is a village situated on the south bank of the Thames, at about nine miles by land from Hyde Park Corner, and sixteen miles by following the windings of the river. The most pleasant mode of conveyance to it is by one of the small steamboats from Hungerford Stairs, for then an opportunity is afforded of seeing numerous beautiful and interesting spots on both banks of the river. In passing upwards, we have on our right, Chelsea; Fulham, at which is the residence of the Bishop of London; and the pretty village of Chiswick; on the left, Battersea, Putney, Mortlake, the royal residence of Kew and its gardens, next which is Richmond. The village of Richmond stands on a slope overhanging the river, and possesses no point of attraction. Opposite the village is a stone bridge crossing the Thames, which is here very much narrowed, and further than this steam-vessels do not go. Richmond is only interesting from its exceedingly beautiful environs. South from the village, a pretty steep bank ascends to the green and bushy eminence called Richmond Hill, and from the walks on its prominent front, a view is obtained of the beautifully wooded country on the opposite side of the river. Among numerous villas, ornamental grounds, and other attractive objects, may be seen Twickenham, situated in the immediate vicinity, on the west bank of the Thames. In the house for which the present was erected as a substitute, lived Pope, the poet, and his body is entombed in the church. Close by Twickenham is Strawberry Hill, once the seat of Horace Walpole, and now belonging to Lord Waldegrave. Moving onwards along the brow of the eminence, and passing the well-known hotel called the Star and Garter, we enter the famous Richmond Park, which is eight miles in circumference, and ornamented with many magnificent large trees. These extensive grounds were at one time connected with a royal palace, but there is now no such edifice—one or two hunting lodges excepted, and these are not used by royalty; but the park is still a domain of the crown, and freely open to the public. From Richmond, it is but a short excursion to

Hampton Court.—Hampton is about thirteen miles from London by land, and twenty-four by water, on account of the windings of the Thames. The village is unimportant, and the chief object of attraction is Hampton Court Palace, which is now open daily, *gratis*. The palace, which is situated within an enclosed garden near the west, or perhaps more correctly the north bank of the Thames, was originally built by Cardinal Wolsey, and a portion of the structure which he reared is still extant in the northern quadranglo. Here was the scene of the humiliation and forfeiture of that favourite of Henry VIII., who at this place often held his court, and made it the scene of his Christmas festivities; here Edward VI. was born; here were held the masques, mummeries, and tournaments of Philip and Mary, and Elizabeth; here James I. held his court and famous meeting of controversialists; here Charles I. was immured as a state prisoner, and took leave of his children; here was celebrated the marriage of Cromwell's daughter and Lord Falconberg; here Charles II. had occasionally his impure residence; here lived William and Mary after the revolution of 1688; and here, till the reign of George II., royal courts were sometimes held. The palace, in external appearance, is a lofty and magnificent structure of red brick, ornamented with pale free-stone cornices and edgings to the doors and windows. Altogether, the edifice consists of three quadrangles. Entering by the grand staircase, the visiter is conducted through a suite of lofty and large apartments, furnished in an old-fashioned style, and decorated with pictures. The guard-room, which is first in order, contains, besides a series of English admirals by Kneller and Dahl, a variety

of ancient warlike instruments. In the next apartment are seen portraits of various beauties of the court of England, painted by Kneller, who has here depicted several lovely countenances, though a sameness runs through the whole, and none are so striking as to leave any impression. In the third room is seen what is generally esteemed as the finest painting in the house—a portrait of Charles I. on horseback, by Vandyke—and which ought to be seen, in order to have a just appreciation of that great master's admirable style. There is also an excellent painting of Bandinelli in his studio, by Correggio. The third room, or audience-chamber, has also some good pictures; among others, a painting of the family of Louis Cornaro, a person celebrated for his extraordinary temperance. The picture, which is from an original, by Titian, shows Cornaro and three generations of descendants, who appear in the act of adoration at a shrine. There are likewise portraits of Titian and his uncle, done by Titian himself, and a spirited battle-piece by Julio Romano.

The fourth apartment, or queen's drawing-room, is enriched with an exceedingly fine painting of Charles I., a whole length, by Vandyke, esteemed the best likeness we have of that monarch. There is a well-known and most beautiful print from it by Sir Robert Strange, the prince of English line engravers. In the next room, or state bed-chamber, the visiter will see a beautiful portrait of Anne Hyde, daughter of Hyde, Earl of Clarendon, and mother of the successive queens, Mary and Anne. The queen's dressing-room and writing-closet, and Queen Mary's state bed-chamber, which follow, contain many fine pictures, by Holbein, Sir Peter Lely, Sebastian del Piombo, Louis da Vinci, Albert Durer, and others. After having traversed these stately and silent halls, the visiter is led out through a long, dreary, ill-lighted apartment, the walls of which are ornamented with what at first sight he may suppose very wretched daubs, but which prove to be some of the famous cartoons of Raphael—productions whose praises have resounded over the whole civilized world.

On the opposite side of the public road from the palace gardens, is *Bushy Park*, a royal domain, embellished with an avenue of splendid horse-chestnut trees, and open to the inspection of the public.

Windsor is situated in the county of Berks, at the distance of 22 miles west from London by the road through Brentford, but may now be reached in less than an hour by the Great Western Railway from Paddington. Windsor occupies a rising ground on the south bank of the Thames, and is only interesting for its ancient and most extensive castle, the chief country residence of the queen. The gates of the castle are close upon the main street of the town, and lead to enclosures containing a number

Windsor Castle.

of mansions, barracks, and other structures. The principal portion of the castle occupies two courts, an upper and lower, of spacious dimensions, and having between them a large round tower in which the governor resides. In the lower court is St. George's Chapel, an elegant Gothic edifice, in which service is performed on Sundays in presence of the royal residents. Besides the chapel, the only parts of the castle attractive to strangers are the state apartments in the upper or northern quarter, and which may be seen by paying a fee of a shilling each person to one of the keepers. Behind these buildings, facing the north, is the famed terrace of the castle, from which a view is obtained over a most beautiful piece of country.

CLUB-HOUSES, HOTELS, &c. IN LONDON.

During the last thirty years, or little more, new habits among the upper classes have led to the establishment of a variety of club-houses—places of resort unknown to our ancestors. A London club-house is either the property of a private person who engages to furnish subscribers with certain conveniences, on paying a certain sum as entrance-money, and a specified annual subscription, or of a society of gentlemen who associate for the purpose. Of the first class, the most noted are Brooke's, White's, and Boodle's, in St. James's Street; also Crockford's, but it superadds the character of a gaming-house. The second class of clubs is most numerous; and the principal are the Carlton, Reform, Athenæum, Clarence, Traveller's, United University, United Service, and Junior United Service. The houses belonging to these clubs, respectively, are among the finest in the west end of London, and may easily be distinguished in and about Pall-Mall and Waterloo Place. No one sleeps in the houses: the accommodations extend the length of furnishing all kinds of refreshments, use of a library, and an ample supply of newspapers and periodicals in the reading-room. The real object of the institutions is to furnish an agreeable lounge to a select number of gentlemen. The Athenæum Club (corner of Pall-Mall), which consists chiefly of scientific and literary gentlemen, is one of the most important. It has 1300 members, each of whom pays twenty guineas of entrance-money, and six guineas of yearly subscription: as in all other clubs, members are admitted only by ballot. The expense of the house in building was £35,000, and £5000 for furnishing; the plate, linen, and glass, cost £2500; library, £4000; and the stock of wine in cellar is worth about £4000. The yearly revenue is £9000. From these items an idea may be obtained of the nature of the London club-houses.

It is calculated that at all times there are 120,000 strangers residing for a few days only in the metropolis, and to accommodate this numerous transient population, there is a vast number of lodging and boarding-houses, hotels, and other places of accommodation. A few years ago, the metropolis possessed 396 hotels, inns, and taverns; 3780 public-houses of licensed victuallers; and 130 beer-shops. The fashionable hotels are situated west of Charing Cross—as, for instance, Mivart's, in Brook street, Grosvenor Square, and Dunn street, Berkeley Square; Warren's, in Regent street; Frenton's, St. James's street; Lemmer's, George street, Hanover Square; the Clarendon, in New Bond street; the Burlington, in Old Burlington street; Wright's, in Dover street, Piccadilly; Morley's, Trafalgar Square, &c. At all the fashionable and family hotels in the "west end" the charges are very high, and the majority of the respectable middle classes lodge at hotels or boarding-houses east of the Strand. In and about Covent Garden there are several highly respectable hotels for single gentlemen; among others, the Cavendish, the New and Old Hummums, and the Tavistock. Another class of hotels or inns are those to which stage-coaches run, and which are resorted to by commercial and other gentlemen; as, for example, the Golden Cross, near Charing Cross; the Bolt-in-Tun, Fleet street; the White Horse, Fetter Lane; the Bell and Crown, Holborn; the Saracen's Head, Snow Hill; the Swan with two Necks,

Lad Lane; the Spread Eagle, Gracechurch street; the Belle Sauvage, Ludgate Hill; and the Bull-in-Mouth, opposite the General Post-office, in St. Martin le Grand. To these we may add three large inn and tavern establishments at the outskirts of the town—the Angel at Islington (northern environs); the Elephant and Castle, Newington Causeway; and the Horns, Kennington Common (both southern environs).

In and about the city there are various large and respectable taverns, at each of which gentlemen are lodged in a comfortable manner; but they are principally designed for accommodating dinner and festive parties. Among these may be mentioned, the London and City of London Taverns, both in Bishopsgate street; the Albion, in Aldersgate street; the Crown and Anchor, Strand; the Thatched House, St. James's street; Freemason's Tavern, Lincoln's Inn Fields; the British Coffee-house and Tavern, Cockspur street; and the London Coffee-house and Tavern, Ludgate Hill. There is, besides, a class of coffee-houses or taverns, whose chief business is supplying small refreshments and dinners, also the accommodation of newspapers, and which are resorted to only by gentlemen. Each of these has a distinct character. Garraway's and Lloyd's, at the Royal Exchange, are associated with marine intelligence, stockjobbing, and auctions; and in Cornhill, opposite, the North and South American Coffee-house supplies American newspapers, and here also are to be seen the captains of vessels who are preparing to sail to different ports in the western continent and islands. At Jerusalem and East India Coffee-house, Cowper's Court, Cornhill, information relating to East India shipping and captains may be obtained from the waiter at the bar. The Chapter Coffee-house, in Paternoster Row, is the resort chiefly of literary and clerical gentlemen, and is a place of grave aspect. Peel's Coffee House, in Fleet street, is celebrated for keeping files of newspapers, which may be consulted; but this accommodation, as respects London papers, may also be had at the Chapter. A small fee is payable to the waiter for examining files at these houses.

The next class of houses of this nature are chop or dining-houses, but also doing the business of taverns, and resorted to only by gentlemen—as Dolly's Chop-house, in Paternoster Row; Dr. Johnson's Tavern, in Bolt Court (a few doors from Farringdon street), in Fleet street; also the Mitre, in Fleet street. Latterly, there has sprung up a very numerous class of coffee-houses, of a much more humble though perhaps more useful nature, at which cups of ready-made coffee and tea, with slices of dressed meat, may be obtained at very moderate prices. In most of these establishments the charge is (or was lately) three halfpence for half a pint of coffee; half a pint of tea, twopence; two slices of bread buttered, twopence; eggs and meat proportionably cheap. While these establishments are chiefly resorted to for breakfast or for refreshment in the evening, there is a far more numerous class of eating-houses, resorted to for dinners by the shopkeeping and working classes. We have room to mention a few great houses—Morton's Excise Dining-rooms, in Bishopsgate street, where about nine hundred dine daily; the famous Boiled-Beef House, Old Bailey (near Ludgate Hill); the Chancery Dining-rooms, in Chancery Lane; and Hancock's Dining-rooms, in Rupert street (a short distance from the head of Haymarket). An excellent dinner may be had at any of these houses for about 1s. 3d., or even less.

Throughout the town there are now many splendid dram-shops called gin-palaces; but of these haunts of intemperance nothing need be said.

PUBLIC RECREATION AND AMUSEMENT.

The chief places of resort during the day, for the recreation and amusement of strangers, may be summed up as follows:—The Parks; the Zoological Gardens in the Regent's Park; another Zoological Garden in Surrey; the British Museum; the National Gallery, the Exhibitions of the Royal Academy, of the Society of British Artists, and of the Society of Painters in Water Colours; the Diorama and the Colosseum, Regent's Park; Sir John Soane's Museum in Lincoln's Inn Fields, open Thursday and Friday during April, May, and June, from 10 till 4 (tickets must be previously applied for); the exhibition of interesting objects of science and arts, Adelaide Gallery, Lowther Arcade, Strand; a similar exhibition at the Polytechnic Institution, Regent street. Several noblemen permit inspection of their picture-galleries: it is admitted that the most extensive and valuable is that of the Duke of Sutherland, Cleveland House, St. James's Place. Besides the regular places of recreation, there are always temporary exhibitions of things interesting to strangers, at the Egyptian Hall, Piccadilly, places in the Strand, &c. Public meetings frequently occur at Exeter Hall, Strand.

The places of evening entertainment are various; and first may be mentioned the theatres, of which there are upwards of twenty in the metropolis. The principal are the Queen's Theatre, or Italian Opera House, foot of Haymarket; Drury Lane and Covent Garden Theatres, being the two licensed for the legitimate drama, and open in the winter season; the Haymarket Theatre, for legitimate drama also, but only open in summer; the Adelphi, in the Strand; the Surrey Theatre, Blackfriars Road; and Astley's Royal Amphitheatre, Westminster Bridge. Latterly, Drury Lane Theatre has abandoned theatricals, and is now opened for cheap evening concerts. Vauxhall Gardens, long a place of evening resort, have been finally closed, having latterly proved ruinous to its lessees. Nearly all the theatres are in a languishing condition, and a large and respectable part of the community now prefer attending Lyceums and Literary Institutions, which combine occasional lectures, a reading-room, and library. One of these establishments is in Aldersgate street, in the city, and another is in Leicester Square, for the western part of the town. Strangers are introduced by members.

CIVIC GOVERNMENT, POLICE, &c.

With respect to civic jurisdiction, the city of London is governed in a peculiar manner. In virtue of ancient charters and privileges, the city is a species of independent community, governed by its own laws and functionaries. While all other boroughs have been reformed in their constitution, London has been suffered to remain, as yet, in the enjoyment of all its old usages. The city is civilly divided into twenty-five wards, each of which has an alderman who is chosen for life, and acts as magistrate within his division. The freemen of the various wards elect representatives annually to the common council, to the number of 236 members. The lord mayor, aldermen, and common council, compose the legislative body for the city. The lord mayor is chosen by a numerous and respectable body of men, called *the livery*, or liverymen; these are certain qualified members of trading corporations, who, except as appointing the lord mayor, sheriffs, members of parliament, &c., do not actively interfere in city management. The revenue of the city corporation, which is derived from sundry dues, rents, interest of bequests, fines for leases, &c., amounted in 1832 to £186,929, 10s. 10d., and the expenditure was nearly the same. The magistracy, police, and prisons, cost about forty thousand pounds annually, but this is exclusive of large sums disbursed by the court of aldermen. The trading companies at present existing are eighty-nine in number, eight which formerly existed being now extinct.

The lord mayor is elected annually, on the 29th of September, from among the body of aldermen. The

livery send a list of two candidates to the court of aldermen, and one of these, generally the senior member, is chosen by them. He enters office, with much pomp, on the 9th of November, which is hence called Lord Mayor's Day. The advocate and legal adviser of the corporation is an official with the title of recorder. The lord mayor and corporation exercise a jurisdiction over Southwark and other precincts. Westminster, which is not connected in civic matters with London proper, is under the jurisdiction of a high bailiff. The county of Middlesex is represented in parliament by two members, chosen by the freeholders; the city of London by four, chosen by the liverymen; Westminster, two, chosen by the rate-paying householders; Marylebone, two; Tower Hamlets (eastern precincts), two; Finsbury (northern precincts), two; Southwark, two; and Lambeth, two. Thus the metropolis, with its immediate neighbourhood, including about two millions of souls, returns eighteen members to the House of Commons, without reckoning those who are sent by the county of Surrey.

Police.—In 1829 the old mode of watching was abolished, in all parts of the metropolis except the city, and a new police force established by act of Parliament. This has been a highly successful and beneficial improvement. The new police is under the management of two commissioners, who are in direct communication with the secretary of state for the home department; under the commissioners are 17 superintendents, 70 inspectors, 342 sergeants, and 2968 constables. The district under their care includes the whole metropolis and environs, with the exception of the city. The constables wear a blue uniform, and may be seen on the street on duty at all times of the day and night. The expense of this most efficient police force in 1837 was £209,754, 11s. 11d. Three-fourths of the expenses are paid out of the parish rates, but limited to an assessment of 8d. per pound on the rental; the remainder is contributed from the public purse. Latterly, the lord mayor and aldermen have established a police force for the city on the model of that above mentioned. It consists of 1 superintendent, 12 inspectors, 50 sergeants, and 638 constables. In addition to these two police bodies, there are nine police offices, in Bow street, Queen Square, Hatton Garden, &c., each with a small body of active officers; and there is likewise a river police, consisting of 22 surveyors and 70 constables. In 1836 a horse patrol was added to the Bow street establishment, consisting of 4 inspectors and 66 patrols, whose sphere of action is the less frequented roads around the metropolis. With all these means of preserving the peace and preventing crime, the metropolis is now one of the most orderly towns in the world; and provided strangers do not seek the haunts of vice, but pursue their way steadily, they run no risk of molestation.

Fires.—In 1833, by an arrangement among the fire assurance offices, there was established a regular fire-suppression police, consisting of a superintendent, 5 foremen, 10 engineers, 9 sub-engineers, and 72 firemen; 33 engines are in constant readiness at twenty different stations, and one-third of the men are constantly on duty, day and night. About 500 fires occur annually, but by the activity of the fire police, not more than from 20 to 30 houses are wholly burnt.

Prisons.—Including Newgate, and the Penitentiary, Millbank, already noticed, there are eleven prisons in the metropolis for the reception of criminals and debtors. The two great debtors' jails are the Fleet Prison in Farringdon street (once called Fleet Market), and the Queen's Bench Prison. The latter is a very large establishment, resembling a kind of small town, within high brick walls; it is situated in the Borough Road, and may be freely entered by strangers. The streets around it are within the "Rules of the Bench," and debtors are permitted to live there in lodgings, on paying to the governor a certain fee, regulated by the amount of the debt.

Lighting.—The whole metropolis is now well lighted with gas, all the public lights being paid for from the parish rates, and by the corporation within the city. In 1840, it was stated that for lighting London and its suburbs there were eighteen gas-works, the property of twelve companies, who consumed 180,000 tons of coal, and derived a yearly revenue of £450,000.

MARKETS—CONSUMPTION.

London contains sixteen flesh-markets, and twenty-five markets for corn, coal, hay, vegetables, fish, or other principal articles of consumption. The flesh-markets are of various kinds, some for live animals, others for carcasses in bulk, and others for the retail of meat; some, also, are for pork, and others principally for fowls. The great cattle-market is Smithfield, situated a short way north from Newgate street. It is a large open space surrounded by buildings, within the city, covered with pens, in numerous subdivisions, to contain cattle for the convenience of the dealers during examination and purchase. The north-west end is appropriated to sheep and calves, the north-east end to hogs, and the centre to bullocks. Calves are conveyed to market in caravans; hogs are driven during the night to their stations. Monday is the principal market-day, but much business is done on Friday, when there is a market for horses. The annual value of the animals sold in Smithfield market is estimated at £8,000,000.

Leadenhall Market is a depôt for meat and poultry killed out of town, and also for the sale of skins. Newgate Market, in a confined situation off Newgate street, is also a great depôt for country-killed meat in bulk, and likewise for supplying by retail. It is from the markets of Smithfield, Leadenhall street, and Newgate, that nearly all the butchers in London and its vicinity are supplied. At Whitechapel, there is a very considerable flesh-market, principally for the retail of meat in that populous district. A few years ago, a flesh-market was established in Farringdon street, and another at Hungerford Stairs, near Charing Cross, both on a commodious plan.

Billingsgate, the principal fish-market of London, is situated on the side of the Thames below the Custom-house. The fish arriving in smacks and boats from the coast, or more distant places, are generally consigned to salesmen, who, during the early market hours, transact extensive business with fishmongers or respectable retailers residing in different parts of the metropolis; the inferior fish are disposed of to costermongers, or those who hawk fish about the streets in baskets. When particular fish are in a prime state, or very scarce, there are individuals who will pay enormously for the rarity; hence a struggle between the boats to reach the market in time. At times, so many boats come laden with the same kind of fish, as to produce a glut, and instead of being sold at a high price, as is usually the case, the fish are retailed for a mere trifle. Throughout the town, there are many fishmongers, at whose shops oysters and other fish, when in season, may be obtained in prime order. The finest oysters are called *natives*, and are sold in small quantities to those who wish to eat them on the spot.

Covent Garden market (connected by Southampton street with the Strand) is the great vegetable-market for the metropolis. The spot, which is exceedingly central to the metropolis, was once the garden to the abbot and convent of Westminster. At the suppression of the religious houses in Henry VIII.'s reign, it devolved to the crown. Edward VI. gave it to the Duke of Somerset; on his attainder it was granted to the Earl of Bedford, in which family it has remained. From a design of Inigo Jones, it was intended to have surrounded the

space with a piazza, but the north and east sides only were completed The west side is occupied by the parish church of St. Paul's, celebrated for its expansive roof, sustained by the exterior walls. The election of members to serve in Parliament for the city of Westminster is held in front of this church; the places for receiving the votes are temporary buildings. The south side is occupied by a row of brick dwellings. Within this square, fruit and vegetables of the best quality are exposed for sale. A large paved space, surrounding the interior square, is occupied by the market gardeners, who, as early as four or five in the morning, have carted the produce of their grounds, and wait to dispose of it to green-grocers, or dealers in fruit and vegetables, residing in different parts of London; any remainder is disposed of to persons who have standings in the market, and they retail it to such individuals as choose to attend to purchase in smaller quantities. Within this paved space, rows of shops are conveniently and elegantly constructed for the display of the choicest fruits and vegetables of the season: the productions of the forcing-house, and the results of horticultural perfection, appear in all their beauty. There are also conservatories, in which every splendour of the garden may be obtained, from the rare exotic to the simplest native flower.

The cultivation of vegetables in the open ground within ten miles surrounding London, has arrived at great perfection; and so certain is the demand, that the whole is regularly conveyed by land or water to the metropolis, so that persons residing in the neighbourhood of those well-arranged gardens have no supply of vegetables but from their own resources. The annual produce of the garden grounds cultivated to supply the London markets with fruit and vegetables, amounts to £1,045,000.

The greater part of the corn used for bread and other purposes in the metropolis, is sold by corn-factors at Mark Lane; but much also arrives in the form of flour. In 1838, the consumption of wheat was 525,407 quarters, and of flour, 515,005 sacks. The annual consumption of butter is 11,000 tons; of cheese, 13,000 tons. The quantity of poultry annually consumed amounts to £80,000, independent of game. The annual consumption of milk is said to amount to £646,000.

In 1837, it was found that the malt used in brewing in London amounted to 5,692,360 bushels; and that there were sent out of stock for consumption 1,270,931 gallons of foreign spirits, 5,354,388 gallons of British spirits, 3,636,362 lbs. of tobacco, and 1,181,723 lbs. of snuff. A certain portion of these supplies would doubtless be drawn by families in the country.

The water used in the metropolis is chiefly supplied by the Thames, and an artificial canal called the New River. The water is naturally good and soft, but far from pure, notwithstanding the filtration to which it is subjected. The spots at which it is raised from the Thames are within the bounds of the metropolis, at no great distance from the mouths of common sewers; this forms one of a number of evils to which the inhabitants submit with a remarkable degree of indifference. The water supplied by the New River Company is more pure, but is charged at a high rate. Eight companies are concerned in the supply of water, and the total quantity distributed daily amounts to 20,829,555 imperial gallons.

The metropolis is supplied with coal principally from the neighbourhood of Newcastle, and partly from Wales, and certain inland counties; the import from the latter being by canals. Newcastle coal is preferred. It arrives in vessels devoted exclusively to the trade, and though the charge for freight is small, so many and so excessive are the duties and profits affecting the article, that a ton of coal, which can be purchased at Newcastle for about 5s., costs, to a consumer in London, upwards of 30s. The quantity of coal imported in 1838 was 2,581,085 tons.

It has been calculated that the money spent annually in London, on articles of consumption and luxury, amounts to £70,000,000; being more than a third of what is spent for such purposes in the whole United Kingdom.

MISCELLANEOUS INFORMATION.

The metropolis contains 500 places of public worship, and attached to these there are not fewer than 600 clergymen. Exclusive of the places of worship of the Jews and various small sects, the number of dissenting chapels in London was lately 200, as follows:—Chapels of Independents, 66; Wesleyan Methodists, 36; Baptists, 32; Calvinistic Methodists, 30; Presbyterians, 16; Roman Catholics, 14; Quakers, 6. The chapels of dissenters are principally in the eastern suburbs of London. The largest of the Roman Catholic chapels is in this quarter, near Finsbury Square. The original Tabernacle, erected by Whitfield, is in Tottenham Court Road. The chapel of the late Rev. Rowland Hill, which can contain 5000 persons, is in Blackfriars Road. Each of the established churches is surrounded with a small burying-ground, and many churches have vaults beneath for sepulture. The odious practice of burying in these confined situations is now gradually going out of use; and many interments take place in new cemeteries in the environs. These cemeteries, which are respectively the property of joint-stock companies, are laid out in a neat manner, and are well worthy of a visit from strangers. The oldest established is that at Kensal Green, in the north-western environs, on the road to Harrow Others are at Norwood in the south, Highgate in the north, and Stoke Newington in the north-eastern environs, and several are in course of establishment. The annual number of deaths in London is about 30,000.

London abounds in charitable institutions of various kinds. The charities connected with the corporation of London are Christ's Hospital, for boarding and educating youth, already mentioned; Bethlehem Hospital, for insane patients; St. Thomas's Hospital, Southwark, for poor patients diseased and hurt; and Bartholomew's Hospital, West Smithfield, for the same purpose. The trades' companies likewise support a number of beneficiary institutions. The following hospitals have been founded and are supported by private benevolence:—Guy's Hospital, Southwark; London Hospital, Whitechapel Road; Westminster Hospital; St. George's Hospital, Hyde Park Corner; Middlesex Hospital, Charles street, Oxford street; the University College Hospital; St. Luke's Hospital, City Road; Small-Pox Hospital, and London Fever Hospital, St. Pancras; and Lock Hospital, Pimlico. Besides these, there are four lying-in hospitals; a floating hospital; various ophthalmic hospitals, and numerous dispensaries and infirmaries for particular diseases. Institutions for relief of indigent persons, deaf and dumb asylums, blind asylums, and orphan asylums, are far too numerous to be specified.

Under the orders of the Poor-Law Commissioners, the metropolis is divided into 26 districts or unions, which, in 1838, absorbed an expenditure on the poor of £401,952. By the active management of the guardians, the annual expenditure is much less than it was under the old wasteful parochial system, while the poor are allowed to be now better employed and more comfortable. Begging is followed as a profession in the metropolis, and there are many persons who subsist by tricks of imposture; nevertheless, although, as has been alleged, there are 15,000 regular beggars of various kinds, it is certain that fewer signs of absolute mendicancy and misery meet the eye in London than in other large towns. As an instance of the growth of provident habits in the humbler orders, it has been stated that in 1837, about 97,000 persons resident in the metropolis had accounts at the different Savings' Banks, and that

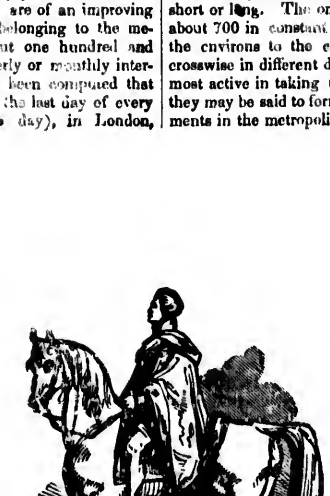
the sum standing at the credit of their accounts was about £2,450,000.

The principal educational establishments in the metropolis are the University College (northern environs); King's College, Strand; and University of London, Somerset House. There are also some important schools, one of which is that of Westminster; but they are more interesting from their antiquity than their usefulness. The National Society for the Education of the Poor, and the British and Foreign School Society, have each large model schools in the metropolis. That of the British and Foreign, Borough Road, is worthy of inspection for its great extent and its well-planned routine of elementary instruction. The metropolis forms the seat of from forty to fifty societies connected with science, literature, and the arts, which may be deemed of national importance. Among these are the Royal Society, Societies of Antiquaries, Linnean Society, Geological Society, Society for Diffusion of Useful Knowledge, Horticultural Society, Royal Geographical Society, Sion College, &c. For a notice of the weekly meetings of these societies, we refer to the Athenæum, a literary periodical.

Lately there were eleven newspapers published daily in London—six in the morning and five in the evening. There were also twenty-four weekly newspapers, and thirty-eight which appeared at other intervals. There were besides about fifty small literary publications issued weekly, the greater part of which are of an improving tendency. Of larger periodicals belonging to the metropolis, there are altogether about one hundred and twenty, which are issued at quarterly or monthly intervals, but chiefly monthly. It has been computed that the number of such works sold on the last day of every month (locally termed magazine day), in London, amounts to half a million of copies, occasioning an expenditure to the public of £25,000.

In recent times, great improvements have taken place in the vehicular conveyance of the metropolis and its neighbourhood. By the trains of the London and Birmingham Railway, terminus at Euston Square; of the South-Western Railway, terminus at Nine Elms, Vauxhall; of the Croydon Railway, terminus same as the Greenwich Railway, at London Bridge; of the Eastern Counties Railway, terminus at Shoreditch; and of the Great Western Railway, terminus at Paddington—trips out of town may now be performed, in different directions, in a very short space of time, and at a small expense.

Within the metropolis, hackney coaches, cabriolets, or cabs, and omnibuses, are exceedingly plentiful. The fare charged for hackney coaches is 1s. per mile, and for cabs 8d. per mile. The cabs, which mostly resemble small chaises, are limited to carry only two passengers. The fare by omnibuses is only 6d. for the ride, whether short or long. The omnibuses, of which there are now about 700 in constant operation, run from all parts of the environs to the central part of London, and also crosswise in different directions; and as their drivers are most active in taking up and setting down passengers, they may be said to form the greatest of modern improvements in the metropolis.



DESCRIPTION OF SCOTLAND.

Scotland occupies the northern part of the island of Great Britain, and, divided from England by a series of hills and rivers, is externally distinguished from that country by many peculiar features. Mountain chains of primitive or at least early rock, and in many instances uncovered by vegetation, form a large portion of the surface, giving occasion for many deep inlets of the sea, which peninsulate several districts, and render the general outline extremely irregular. Lakes embosomed in the hills, and clear, copious, and rapid rivers pouring along the vales, help to complete that picture which a native poet has expressed in the well-known apostrophe—

> "Land of the mountain and the flood,
> Land of brown heath and shaggy wood"

The arable ground, which is not above a third of the whole surface, chiefly lies in tracts sloping to the seacoast, and in the lower parts of the vales. The less precipitous hilly districts are chiefly occupied as pastoral ground for sheep and cattle. Wood, which once covered a large portion of the surface, is now chiefly confined to the neighbourhood of gentlemen's seats, and to plantations which have been raised within the last fifty years for the protection of arable lands from the cold winds.

The mainland of Scotland is situated between 54° 38′ and 58° 40′ north latitude, and 1° 47′ and 5° 45′ west longitude. It is bounded on the east by the German Ocean, on the north by the Northern Ocean, on the west by the Atlantic, and on the south by England. The greatest length is 287 miles, and the greatest breadth 147 miles. The entire surface, including the islands, contains 30,000 square miles, or nearly 20,000,000 of English statute acres.

To the north of a southward curving line, stretching between Glasgow and Aberdeen, the country is more mountainous than elsewhere, and therefore bears the general appellation of the *Highlands*. This is a district full of romantic scenery—savage precipitous mountains, lakes, rushing streams, and wild hanging natural woods. Its population, numbering about 400,000, or a sixth of the entire population of the country, is of Celtic (and in a less degree Scandinavian) descent, and exhibits many peculiar features, in language, dress, and manners, which are, however, rapidly becoming obliterated. The remainder of the country is termed the *Lowlands*, as containing less ground of an elevated and irregular character, though here also there are several considerable ranges of mountains. The inhabitants of this district, who are more peculiarly entitled to be considered as *the Scotch*, are, like the English, a Teutonic people, but with probably a mixture of Celtic blood; and their language may be considered as only a variety of English.

Connected with Scotland are two large groups of islands; namely, the *Northern Islands*, including the Orkney and Shetland Isles, situated in the Northern Ocean; and the *Hebrides* or *Western Islands*, situated in the Atlantic Ocean.

Scotland and its islands contain thirty-three counties, which may be thus classed:—*Border Counties* (so called because forming the border adjacent to England)—Berwick, Roxburgh, and Dumfries. *South-Western Counties*—Kirkcudbright and Wigton. *Western Counties*—Ayr, Lanark, Renfrew, Bute, and Argyll. *Central Counties*—Peebles, Selkirk, Haddington, Edinburgh, Linlithgow, Stirling, Dunbarton, Clackmannan, Kinross, Fife, and Perth. *North-Eastern Counties*—Forfar (or Angus), Kincardine (or the Mearns), Aberdeen, Banff, Elgin (or Moray), and Nairn. *Northern Counties*—Inverness, Ross, Cromarty, Sutherland, Caithness, and Orkney.

For ecclesiastical purposes, the country is divided into parishes (which are also civil divisions), presbyteries, and synods. (See Constitution and Resources of the British Empire.)

The principal rivers are Tweed, Annan, Nith, Dee (Kirkcudbright), Ayr, Clyde, Beauly, Ness, Findhorn, Spey, Deveron, Ythan, Don, Dee (Aberdeenshire), Tay, Forth, Carron, Leith, and Tyne. The Tay is the most copious, and the Spey the most rapid. Scarcely any of these rivers are navigable to a considerable distance from the sea.

The mountains of Scotland are generally in groups or ranges. The Highlands may be considered as one great cluster of hills; but those bordering on the Lowlands, and extending between Stirlingshire and Aberdeenshire, are more particularly distinguished as the *Grampian Mountains*. The other principal ranges are the *Sidlaws* in Forfarshire; the *Campsie Hills* in Stirlingshire; the *Pentlands* in Edinburghshire; the *Lammermoors*, extending between Berwick and Haddingtonshire; the *Cheviot Hills* on the Border; and a great range, of no general name, extending throughout the counties of Selkirk, Peebles, Dumfries, Lanark, Ayr, and Kirkcudbright. The most noted of the Highland mountains are Ben Nevis (4370 feet, being the highest in the United Kingdom), Ben Mac Dhui (4327), Cairngorm (4095), Ben More (3870), Ben Wyvis (3720), and Ben Lomond (3262). The highest of the Pentland range is Carnethy (1880). Amongst the southern hills, few exceed 2500 feet.

Geological Structure.—Soil.—Climate.

In the Highlands, the rocks are generally of the primary kind—granite, gneiss, mica-slate, &c.; the granite generally rising into lofty peaks, on which, in many instances, gneiss and other non-fossiliferous rocks abut or rest. In the Lowlands, the rocks are generally of the transition kind (grawacke, &c.), covered in many parts

with coal-measures, trap, and red sandstone. Rocks superior to the red sandstone occur only in a few detached places, and in very small quantity.

The coal-field of Scotland extends, with slight interruptions, across the central part of Scotland, from the eastern extremity of Fife to Girvan in Ayrshire; the principal beds being near Dysart and Alloa, in the vale of the Esk near Edinburgh, near the line of the Forth and Clyde Canal, at Paisley in Renfrewshire, and at Dalry, Kilmarnock, and Girvan, in Ayrshire. The Scottish coal is chiefly of a hard and lumpy kind, calculated to burn briskly, and therefore well adapted for manufacturing as well as for domestic purposes.

Granite is dug in the neighbourhood of Aberdeen, and at Kirkcudbright, for building purposes. The city of Aberdeen itself is chiefly constructed of it; and great quantities of it are transported to London, Liverpool, and other places, to be employed in building bridges, docks, and other structures in which unusual durability is required. Slates of excellent quality for roofing are quarried at Easdale and Ballahulish in Argyllshire, and in other places. Sandstone slabs for paving are quarried in Caithness, and at Arbroath in Forfarshire. A fine kind of sandstone is dug in many places, and is the primary cause of the architectural elegance of many of the public and private buildings in the principal towns. Owing to the abundance of both sandstone and trap, both of which are excellently adapted for building, little brick is used in Scotland.

The chief metals worked in Scotland are lead and iron. Lead is extensively wrought in the hills near the junction of Lanark and Dumfries shires, and silver was formerly obtained in considerable quantities in the same district. Iron has latterly been worked on a great scale in the northern district of Lanarkshire, and in the counties of Renfrew and Ayr. Agates, topazes, cornelians, and some other precious stones are found in the highlands of Aberdeenshire. Mineral waters, useful for various maladies, exist at Dunse, Moffat, Innerleithen, Airthrey, Bridge of Earn, Peterhead, and Strathpeffer.

The soil of Scotland is of an extremely diversified character. On the comparatively level tracts, much is composed of loam resting on the great clay bed, or diluvium, or of alluvial clay washed down from the hills. Much level as well as hilly ground is also covered by peat bog, the dissolved forests of ancient times. On the trap hills, a light and useful soil, composed of the material below, is generally found. A considerable quantity of the arable soil throughout, being composed of reclaimed bog, contains a peaty material. Out of the thirty thousand square miles comprehended in Scotland, about thirteen thousand are totally incapable of improvement, nine thousand are wastes believed to be capable of improvement, and the remainder are pretty equally divided between arable and pasture land.

The climate, as compared with that of England, is cold, cloudy, and wet; yet the temperature is not liable to such great extremes as that of either England or France, seldom falling below 25° Fahrenheit, or rising above 65°, the annual average being from 45° to 47°. The summer is uncertain, and often comprehends many consecutive weeks of ungenial weather; but, on the other hand, the winters are rarely severe, and often include many agreeable days and even weeks. The backwardness of spring is perhaps the worst feature of the meteorological character of the country.

ANIMAL AND VEGETABLE PRODUCTIONS.—AGRICULTURE.

The country, as already mentioned, was originally covered in great part by wood; and this feature is believed to have been expressed in its ancient name, Caledonia (*choille dun*, Gaelic, a wooded hilly country). The natural wood has been allowed in the course of ages to go into decay, in all except a few remote districts, of which we may particularize the high country at the junction of Aberdeen, Banff, Moray, and Inverness shires. In the last century, Scotland had become nearly bare of wood, the only patches being around gentlemen's seats. Within the last fifty years, this state of things has been greatly changed. Extensive plantations have been formed in most districts, as a protection to the cultivated lands. Those of the Duke of Athole in Perthshire are remarkable, above all, for the vast territory which they occupy. Scottish plantations consist chiefly of larch and fir; but the country also produces oak, ash, and elm, in great abundance. It is calculated that about a million of acres in Scotland are now under wood.

Scotland formerly abounded in wild animals, particularly the wild-boar, the wild-ox, and the wolf. The wild-boar has been for many ages extinct; and the wolf has been so since the latter part of the seventeenth century. Of the primitive white wild cattle of the country, there is now only a specimen herd, preserved from curiosity in the parks near Hamilton Palace. Birds of prey, the eagle, falcon, and owl, are still found in the Highlands and Western Islands, where also deer and game birds are abundant. Aquatic birds haunt the more precipitous shores in vast quantities. Hares and rabbits everywhere abound, and foxes are not scarce. The rivers of Scotland produce salmon and trout, and herrings, haddocks, cod, and flounders, exist in great abundance in the neighbouring seas.

Husbandry was in a very backward state in Scotland till the middle of the eighteenth century. The Highlands produced herds of the native small black cattle; in the low countries, the higher grounds were occupied, as now, by flocks of sheep; but there was little arable land, and that little was ill cultivated and comparatively unproductive. Since then, under the care of a set of patriotic and enlightened individuals, Scotland may be said to have been one great experimental farm for the advancement of husbandry in all its forms. The rearing of turnips for the winter support of cattle has been in itself a most remarkable improvement. A proper rotation of crops has been studied, and has been attended with the best effects. Old, cumbrous, and expensive modes of tillage have been banished, and the light plough and cart substituted in their place. Draining has improved not only the soil but the climate. Lime, and latterly bone manure, have been extensively introduced. The productiveness of the soil has consequently increased in an immense ratio. Oats, a hardy plant, calculated for most soils and climates, is still the chief grain raised in Scotland, and its meal is still the principal food of the peasantry, of working people in general, and of the children of all classes of the community: it is said to cover 1,260,000 acres, or a fourth of the whole in cultivation. Barley, which forms a conspicuous article in the food of the common people, and is also used in distillation, occupies 280,000 acres. Wheat is believed to occupy only about 140,000 acres; yet it is remarkable that this grain is exported in considerable quantity from Scotland, while the above two grains are in not less quantity imported from England and Ireland, testifying that the ancient frugal habits of the people with respect to food change less rapidly than the improvement of the soil advances. Potatoes are extensively raised in open fields in Scotland, and now constitute an important article of food to the working classes. The southern hills continue as formerly to be covered by extensive flocks, and sheep-farming has also been extensively introduced in the Highlands. The latter change has necessarily caused the extinction of a kind of cottier system, which came down from the old days of feudalism; yet it is believed that black cattle are as extensively reared in the Highlands as ever, and it is certain that

the population, so far from being diminished by the suppression of small farms, increased about one-seventh during the first thirty years of the present century.

THE PEOPLE—THEIR CHARACTER.

The Scotch, as already mentioned, are, like the English, a Teutonic people, with only a few distinctive varieties of character, perhaps partly original, and partly the effect of local and political circumstances. It may be remarked, that, though in the main Teutonic, the Scotch do not descend from the same branch of that race as the English. From language and other circumstances, it appears likely that the original colonizers of North Britain were from Scandinavia, Denmark, and Zealand.

The Scotch (taking as usual the general characteristics of the people) may be described as a tall, large-boned, and muscular race. Even the women appear to a southern eye remarkable for the robustness of their figures, though this is a point which the natives are of course apt to overlook or to be unconscious of. The Scotch figure is not so round and soft as the English. The face, in particular, is long and angular, with broad cheek bones. The cranium is also said to be somewhat larger, and tending more to a lengthy shape than that of the English. A fair complexion and light colour of hair abound in Scotland, though there are also many instances of every other variety of tint.

The Scottish character exhibits a considerable share of both energy and perseverance. It may safely be said, that a country with so many physical disadvantages could never have been brought into such a condition as respects rural husbandry, nor, with all the advantage of the English connection, been made so prosperous a seat of both manufactures and commerce, if the people had not been gifted in a high degree with those qualities. A disposition to a frugal and careful use of means is also abundantly conspicuous in the Scotch. The poorest poor, at least in rural districts, are in few instances of such improvident habits as to exhibit that destitution of furniture, clothing, and tolerable house accommodation, which meets the eye almost everywhere in Ireland. Caution, foresight, and reflection, may be said to enter largely into the Scottish character. Under the influence of these qualities, they are slow and sometimes cold in speech, and are therefore apt to appear as deficient in frankness and generosity. These, however, are in a great measure only appearances. That *pervidum ingenium*, or fiery genius, attributed to them by Buchanan, is still a deep-seated characteristic of the people. On subjects which they regard as important, they sometimes manifest this excitability in a very striking manner; as, for instance, in their almost universal rising against Charles I. in defence of their favourite modes of worship and ecclesiastical polity. Generous affections, in which, as compared with the English, the Scotch might appear deficient, perhaps only take, in their case, somewhat different directions. They cherish, more than most people, a feeling of attachment for their native country, and even the particular district and spot of their birth, for their remote as well as immediate kindred, and for every thing which reminds them of what is honourable in the doings of those who went before them. A strong sense of religion is a conspicuous feature in the Scottish national character; clear, however, from all regard to external and what appear to them unimportant things connected with it. There is no country where a more decent attention is paid to the Sabbath than in Scotland. It may at the same time be remarked, that their religion is more doctrinal than directly practical or sentimental—a peculiarity which may be traced in the plainness of their forms of worship, as either its cause or its effect. There is a considerable tendency in the Scottish intellect to argumentative reasoning, and this shows itself in the service in their churches as well as in their philosophical literature. The domestic virtues flourish in much the same degree in Scotland as in England; but the humbler classes in North Britain are not nearly so remarkable for cleanliness as the lower English, and they have suffered of late years from the extensive use of ardent spirits. The rural labouring classes are remarkable for their steady industry and decent conduct; and it is only, perhaps, among the lower orders, in large towns, that much moral deterioration has taken place. For centuries, the wandering disposition of the Scotch has been remarkable. An immense number of young persons every year leave their native country to push their fortunes in the busier English cities, in public employment in India, in the colonies, or in other parts of the world. These persons have generally a tolerable education in proportion to their rank and prospects; and being found possessed of steadiness, fidelity, and perseverance, they rarely fail to improve their circumstances. We are here reminded of the advantage which Scotland has long enjoyed in the possession of a universally diffused means of elementary instruction. This, though in some respects over-estimated, has at least insured that nearly every person reared in Scotland is not without some tincture of literature.

PROGRESS OF POPULATION.

The population of Scotland, at the end of the seventeenth century, did not probably exceed a million. In 1755, when an attempt was first made to ascertain it, it appears to have been about 1,265,380. From that time, the country made a start in manufacturing and commercial prosperity, as well as in improved modes of rural husbandry, and the population experienced accordingly a considerable increase, though not so great in proportion as the increase of wealth. The various census, since 1801, inclusive, give the following results:—

1801, - -	1,599,068	1821, - - -	2,093,456
1811, - -	1,805,688	1831, - - -	2,365,114

The increase has taken place chiefly in large towns, a result of the progress of manufactures and commerce. It was ascertained that, of the total families in 1821, 130,679 were employed in agriculture, and 150,264 in trade, manufactures, and handicrafts; leaving a remainder of 126,997 subsisting otherwise. Since then, the proportion of the second class has probably experienced a large increase. The progress of population in Scotland has, according to Mr. M'Culloch, "been less than its progress during the same period in England and Ireland; while there are good grounds for thinking that the wealth of Scotland has increased more rapidly than that of either of these two countries. This desirable result," our author adds, "seems to have been owing principally to the consolidation of small farms in the low country, the introduction of sheep-farming into the Highlands, and the obstacles imposed, by the law of Scotland, as to leases and the operation of the poor-laws, against the subdivision of land and the building of superfluous cottages. These circumstances, combined with the moral and religious habits of the people, and the general diffusion of education, have made marriages be deferred to a later period than in other parts of the empire, and have also led to a very extensive emigration. * * In consequence, the Scotch have advanced more rapidly than the English or Irish in wealth, and the command of the necessaries and conveniencies of life. Their progress in this respect has, indeed, been quite astonishing. The habits, diet, dress, and other accommodations of the people, have been signally improved."*

It has been shown, on the other hand, that the comforts of the people have not everywhere improved in the ratio of the general advance of wealth. That operation

* Statistica. Account of the British Empire.

of the limited poor-laws of Scotland which Mr. M'Culloch eulogizes, has been shown by Profess r Alison of Edinburgh to send annually great numbers of superannuated labourers and others into the large towns, where they form a dense population, living in semi-destitution, and in other circumstances unfavourable to health, and are thus exposed to fevers and other contagious maladies, which periodically sweep them off in large numbers. It is contended by the same writer, that the low condition in which the scanty provision for pauperism compels many to live, gives them reckless habits, and tends materially to increase a mean, squalid, and dangerous population. There is certainly much truth in these views. The sanitory condition of Glas[illegible]ow is a startling illustration of them. During five years, from 1835 to 1839 inclusive, the number of fever cases treated at the public expense in that city was 56,049, or about 11,000 per annum, and the deaths in the same period were 4788. The population of Glasgow has risen from 151,540 in 1822, to 272,000 in 1840, and in that period the rate of mortality has been rapidly advancing. In 1822, the mortality was 3408, or one in about 44¼ of the population; in 1825, it was 4571, or as one in about 36¼. In 1828, the mortality increased to 5534, which, at the then amount of the population, was one in 33—a proportion alarmingly high. Since then, however, the inhabitants of this great city have suffered still more severely. In the year of the Asiatic cholera, 1832, when the population was 209,230, the mortality reached the enormous amount of 9654, or one in about 21½; and again, in a year of severe fever (1837), when the population was estimated at 263,000, it reached 10,270, or one in about 24½. It would appear as if, after such disastrous periods, the mortality becomes for some time lessened. After 1832, it rebounded to one in 36, and after 1837 to one in 37, or thereabouts. Probably this is in some measure owing to the effect of severe epidemics in carrying off so many of the least healthy of the people. It is to be remarked that in these results no account is taken of still-born children, who, in the eighteen years before 1840, amounted to 8763. The proportion of the still-born is startlingly high, being, in 1830, 471 out of 6868, or about a fourteenth. In this fact alone, we cannot help thinking we behold a strong proof of the amount of misery and unfavourable modes of living prevailing in Glasgow.

The average annual mortality in Glasgow was, for the period between 1822 and 1830, both inclusive, one in 38¼; for the period between 1831 and 1839, also both inclusive, one in nearly 32. At the latter date, if it were habitual, Glasgow would stand forth as one of the cities most fatal to human life in Europe. Another fact is most remarkable, that of the deaths during these eighteen years, 43 per cent., *or not much short of the one-half, are of children under five years of age, and* 18 *per cent. under one year of age.* It further appears, from minute evidence, that in the years of unusually great mortality, there is a larger proportion of deaths amongst the adult population, *showing how fatal the epidemics are to heads of families.* From one-fourth to one-fifth of the funerals in Glasgow are at the public expense—an impressive fact, seeing how it *connects poverty with mortality.*

REMARKABLE NATURAL SCENERY.—NATURAL CURIOSITIES.

The comparatively irregular surface of Scotland, or, as a geologist would remark, its being more generally formed of the primitive and early rocks, has caused the existence of much picturesque and romantic scenery, the attractions of which have been greatly heightened of late years by the works of the native poets and novelists, particularly Sir Walter Scott. The Highlands may be said to form one wide tract of such scenery, though some parts are considerably more beautiful than others. Fine scenery in Scotland generally lies along the beds of lakes or the vales of rivers. The chief tracts are the following:—

Lower Perthshire.

The Trosachs and Loch Katrine.—This is a beautiful district, situated at the distance of little more than twenty-five miles from Stirling, and remarkable as the scenery of Scott's *Lady of the Lake.* It may be said to commence at the large lowland village of Callander, which is only sixteen miles from Stirling. This village lies in the bosom of the valley of the Teith, with lofty hills on all sides except the east, and apparently occupying the last patch of level ground before the traveller enters the Highlands. The surrounding scenery is worthy of being explored; two places, in particular, should be visited. The first is the *Fall of Bracklin*, situated among the hills, at the distance of a mile and a half in a north-easterly direction from the village. It consists of a series of cascades formed by the impetuous rushing of a mountain stream, termed the Keltie, down a rugged rocky ravine. Each cascade is from eight to ten feet in depth, and altogether, the falls may measure upwards of a hundred feet, before they finally settle in a profound receptacle at the bottom. Above the chasm there is thrown a rustic footbridge, from which the view of the falls, when the water is large, is particularly grand. This spot is worthy of being visited by geologists, on account of the singular masses of rifted rock over and among which the water impetuously dashes.

The other place to which we would draw attention is the *Pass of Leny.* This is a narrow opening, about a mile to the north-west of the village, which affords access, as its name imports, from the low country into the wild recesses of the Highlands. While the vale of the Teith continues towards the west, the road to the Pass of Leny strikes off in a north-westerly direction. Skirted with waving woods and bound in by lofty mountains this is a scene of great sublimity. A rapid river, which issues from the mountain lake denominated Loch Lubnaig, hurries through the narrow vale over a series of little cascades, yielding a music harsh and wild, in strict keeping with the ruggedness of the scene. The road leads along the brink of Loch Lubnaig, to the small parish village of Balquidder, where, in the churchyard, the grave of the celebrated freebooter Rob Roy is still pointed out.

The road towards the Trosachs pursues a tortuous line along the base of a mountain range, skirting the north side of the valley. In the bottom of the vale, lie in succession two long stripes of water, or lakes, called Loch Vennachar and Loch Achray. Immediately before approaching the eastern extremity of the last of these lakes, which is by much the smallest, a road leads off to the right, into the vale of *Glenfinlas*—a tract of ten miles in extent, formerly a royal hunting-forest, destitute of the smallest symptom of habitation or of cultivation, and which any one who wishes to have a complete idea of an Ossianic desert, in all its sterile and lonely wildness, may be recommended to traverse. The bridge crossing the stream which descends from that vale, is called the Bridge of Turk, on account of a wild boar, which had done much mischief in the neighbourhood, having been slain at the place in times long bygone.

On coming to the head of Loch Achray you approach the Trosachs. At this point is situated an inn, having a strange Gaelic name, sounding something like Ardrecrockran. This is the last human habitation on the route, and here travellers usually quit their vehicles, in order to walk the remainder of the distance; the road, however, will accommodate a chaise to the verge of Loch Katrine. The Trosachs is simply a concluding portion of the vale, about a mile in extent, and adjoining to the bottom of Loch Katrine. From the tumultuous confu-

sion of little rocky eminences, of all the most fantastic and extraordinary forms, which lie throughout the bottom of the vale, and are everywhere shagged with trees and shrubs, nature here wears an aspect of roughness and wildness, of tangled and inextricable boskiness, totally unexampled. The valley being contracted, hills, moreover, rise on each side to a great height, which, being entirely covered by birches, hazels, oaks, hawthorns, and mountain ashes, contribute greatly to the general effect. The meaning of the word *Trosachs* in some measure describes the scene—a rough or *bristled* piece of territory. The author of the *Lady of the Lake* has described it as "a wildering scene of mountains, rocks, and woods, thrown together in disorderly groups."

At the termination of the Trosachs, Loch Katrine commences: it measures about ten miles in length, and is justly reckoned one of the most beautiful in Scotland. Its principal charm consists in the singular rugged wildness of its mountainous sides, and its pretty rocky islets, rising to a considerable height out of the water, and tufted over with trees and shrubs. Near the eastern extremity of the lake, there is precisely such an island as that which is described in the poem as the residence of the outlawed Douglas and his family. To fulfil the rules of the imagination—if such a phrase may be used—Lady Willoughby D'Eresby, the proprietrix of the ground, has erected upon the island a sort of tower or cottage, such as that which the said family occupied; and he must be a traveller of more than ordinary churlishness who could refrain from indulging in the pleasing deception thus created.

The view of the lake, on approaching it on the east, is rather confined, but from the top of the rocky and woody mount above, the prospect is more extensive and of that singular beauty which the author of the *Lady of the Lake* has described in the following passage:—

> ——"Gleaming with the setting sun,
> One burnish'd sheet of living gold,
> Loch Katrine lay beneath him roll'd,
> In all her length far-winding lay,
> With promontory, creek, and bay,
> And islands that, empurpled bright,
> Floated amid the liveliest light.
> And mountains that like giants stand,
> To sentinel enchanted land.
> High on the south, huge Ben-venue
> Down on the lake its masses threw—
> Crags, knolls, and mounds, confusedly hurl'd,
> The fragments of an earlier world;
> A wildering forest feather'd o'er,
> His ruin'd sides and summit hoar;
> While on the north, through middle air,
> Ben-an heaved high his forehead bare."

Loch Earn.—The beautiful scenery connected with this lake may be said to commence at Comrie, a village about twenty miles to the west of Perth, and remarkable as the place of all others in the United Kingdom where earthquakes take place most frequently. The vale of the Earn is here, and even lower down, full of natural and acquired beauty. Passing upwards towards the lake, the scenery becomes more interesting at every step. At that part of the vale which adjoins to the bottom of the lake, its character is similar to that of the Trosachs, at the corresponding extremity of Loch Katrine, though less minutely rugged and picturesque. Passing through the extensive grove at the bottom of the valley, now within sight and hearing of the ever-glancing and ever-murmuring Earn, and then beyond both, as the road approaches and recedes from the water-side, the traveller gets frequent broken glimpses of the grand and wildly serrated tops of the neighbouring mountains, whose sides present a strange piebald mixture, by no means deficient in effect, of alternate bare crag and incumbent verdure—a beautiful confusion, indeed, of gray and green—relieved occasionally by the darker branches of the birch and weeping-ash.

Loch Earn extends nine miles in length, and generally about one mile in breadth. It is thus described by Dr. M'Culloch:—"Limited as are the dimensions of Loch Earn, it is exceeded in beauty by few of our lakes, as far as it is possible for many beauties to exist in so small a space. I will not say that it presents a great number of distinct landscapes adapted for the pencil; but such as it does possess, are remarkable for their consistency of character and for a combination of sweetness and simplicity, with a grandeur of manner, scarcely to be expected within such narrow bounds. Its style is that of a lake of far greater dimensions; the hills which bound it being lofty, and bold, and rugged, with a variety of character not found in many of even far greater magnitude and extent. It is a miniature and model of scenery that might well occupy ten times the space. Yet the eye does not feel this. There is nothing trifling or small in the details; nothing to diminish its grandeur of style, and tell us we are contemplating a reduced copy. On the contrary, there is a perpetual contest between our impressions and our reasonings; we know that a few short miles comprehend the whole, and yet we feel as if it were a landscape of many miles—a lake to be ranked among those of first order and dimensions. While its mountains thus rise in majestic simplicity to the sky, terminating in bold, and various, and rocky outlines, the surfaces of the declivities are equally bold and various; enriched with precipices and masses of protruding rock, with deep hollows and ravines, and with the courses of innumerable torrents which pour from above, and, as they descend, become skirted with trees till they lose themselves in the waters of the lake. Wild woods also ascend along their surface, in all that irregularity of distribution so peculiar to these rocky mountains; less solid and continuous than at Loch Lomond; less scattered and romantic than at Loch Katrine, but, from these very causes, aiding to confer upon Loch Earn a character entirely its own." In passing along Loch Earn, it is recommended to go by the road on the south side. The house of Ardvoirdlich (Stewart, Esq.) occurs about mid-way; its name recalls the memory of Stewart of Ardvoirdlich, a partisan of Montrose, who killed his friend Lord Kilpont in the royalist camp at Collace, September 5, 1644—the incident on which Scott founded his *Legend of Montrose*. The woody promontories which here project into the lake are remarkably beautiful. About a mile and a half from the west end of the lake, occur the castle and falls of Edinample, a scene of distinguished loveliness, such as people, in the spirit of compliment, say, might give occasion to a volume, and which, rather strange to tell, has actually done so.

The upper extremity of this beautiful lake, where the general merits of the scenery may be said in some measure to be altogether condensed and combined, is enlivened by the little village and inn of Loch Earn Head.

Middle Perthshire.

Dunkeld.—This small town, so celebrated for the fine scenery in its neighbourhood, is situated on the north bank of the Tay, at the distance of fifteen miles from Perth, and twenty-four from Kenmore. Nestling beneath steep and woody mountains, with a noble river running in front, across which there is an elegant bridge, the first view of Dunkeld, in approaching it from the south, is very striking. The village consists of two small streets, in which are two excellent inns, affording extensive accommodation for the tourists who flock hither in summer. At Dunkeld, attention is called to the venerable remains of a cathedral, and the Duke of Athole's mansion, styled Dunkeld House; but our present business is with the natural scenery. Most of this is in the pleasure-grounds connected with the mansion.

Craig-y-Barns, a lofty hill, wooded to the top, which rises behind the house, is a resort of tourists for the sake of the magnificent view which it commands. They are also conducted by guides to the scenery of the *Braan*,

which joins the Tay on its opposite bank near the village of Inver—the birthplace and usual residence, it may be mentioned, of the late Neil Gow, so famous wherever Scottish music is known, at once for his performance on the violin and his excellent compositions. Near this place the tourist is conducted into a tasteful hermitage or summer-house, named Ossian's Hall, where he sees before him a picture representing the aged Ossian singing to some females the tales "of the days that are past," while his dog, his hunting-spear, and bow and arrows, lie at his side. On a sudden, this picture slips aside, and discloses to the view of the surprised stranger a splendid cataract, which dashes down the rocks immediately opposite to the building, and the waters of which are reflected from a range of mirrors disposed around the hall. To use the words of Dr. Clarke, "The whole cataract foams at once before you, roaring with the noise of thunder. It is hardly possible to conceive a spectacle more striking. If it be objected that machinery contrivance of this sort wears too much the appearance of scenic representation, I should reply, that as scenic representation I admire it, and as the finest specimen of that species of exhibition; which, doubtless, without the aid of such a deception, would have been destitute of half the effect it is now calculated to produce. A little below this edifice, a simple but pleasing arch is thrown across the narrow chasm of the rocks, through which the river flows with vast rapidity. About a mile higher up the Bran, is the *Rumbling Bridge*, thrown across a chasm of granite, about fifteen feet wide. The bed of the river, for several hundred feet above the arch, is copiously charged with massive fragments of rock, over which the river foams and roars like the waters of Ivy Bridge in Devonshire. Approaching the bridge, it precipitates itself with great fury through the chasm, casting a thick cloud of spray or vapour high above the bridge, and agitating by its fury even the prodigious masses which form the surrounding rocks. Few objects will more amply repay the traveller for his trouble of visiting them, than the woody precipices, the long, winding, shady groves, the ruins, and cataracts of Dunkeld."

In the angle formed by the junction of the Bran and Tay rises *Craig Vinean*, a broad shadowy mass of firs, reared against the sky. A neighbouring eminence obtains the name of the *King's Seat*, in consequence of King William the Lion having been in the habit of stationing himself upon it, in order to shoot at the droves of deer which his attendants caused to pass through the adjacent hollows. It is related that Queen Mary also practised the same sport at this place, and on one occasion narrowly escaped destruction from an infuriated stag.

Aberfeldy, Kenmore, and *Killin.*—Tourists frequently proceed from Dunkeld along the bank of the Tay, in order to comprehend the tract of scenery here indicated. *Aberfeldy*, a village not in itself remarkable, is celebrated for the fine cataract, formed by a small tributary of the Tay, in its neighbourhood, and near the house of Moness. The tourist is conducted by a guide along the thickly wooded banks of this rivulet, till, about a mile from the village, he reaches the first of the celebrated waterfalls of Moness. A little sub-tributary rill here pours, in a series of cascades, down the side of the glen, amidst a natural scene of the greatest beauty. A little farther up the main dell, the rivulet pours along a steep natural staircase, of a hundred feet in perpendicular descent, the sides of which rise abruptly and ruggedly, clothed with the most beautiful natural plants. This scene is described by Burns in one of his songs:—

"The braes ascend like lofty wa's,
The foaming stream deep roaring fa's,
O'erhung wi' fragrant spreading shaws,
The birks of Aberfeldy.
The hoary cliffs are crown'd wi' flowers;
White o'er the linn the burnie pours,
And, rising, weets wi' misty showers,
The birks of Aberfeldy."

At a third cataract, higher up, the pathway crosses the stream, and descends on the other side of the dell. Pennant describes the Moness Falls as "an epitome of every thing that can be admired in the curiosity of waterfalls."

A ride of six miles along the Tay brings the traveller to *Kenmore*, a village of famed Perthshire, situated at the east end of Loch Tay, at the place where the river issues from that sheet of water. This is one of the chief stages, or *points*, in the tour of Perthshire, and it is provided, accordingly, with a good inn. Lofty hills ascend on each side; on one hand there is a noble lake; on the other, towards Aberfeldy, stretch the splendid grounds around Taymouth Castle, the seat of the Marquis of Breadalbane. This magnificent house—truly worthy of the great chief and land-proprietor who owns it—is about a mile to the east of Kenmore, the exterior gateway of the park opening from the street of the village. It is a dark gray castellated edifice, of modern aspect, situated in the low ground beside the river, with a beautiful backing of woody hills rising behind it. This princely place and its adjuncts made a deep impression on the mind of Burns, who visited it in 1787, and thus described it:—

"The outstretching lake, embosom'd 'mong the hills,
The eye with wonder and amazement fills;
The Tay, meandering sweet, in infant pride;
The palace rising by his verdant side;
The lawns, wood-fringed, in nature's native taste;
The hillocks dropp'd in nature's careless haste;
The arches striding o'er the new-born stream;
The village glittering in the noon-tide beam."

A guide is required to introduce a stranger to all the beauties of the Taymouth Park, among which the most remarkable is the *Berceau Walk*, a grand avenue of four hundred and fifty yards in length, which reminds one of some lofty cathedral, "casting a dim religious light."

Loch Tay is a fine sheet of water, fifteen miles in length, lying between two ranges of hills. In the centre of the north-west side rises *Ben Lawers*, to the height of 4015 feet. An island near Kenmore formerly contained a priory of Augustines, founded by Alexander I., in the year 1122. Here his queen, Sybilla, daughter of Henry I., of England, was buried. Loch Tay is remarkable, like some other Scottish lakes, for having been, on several occasions, greatly agitated at the moment of the occurrence of earthquakes in distant parts of the world. It is from fifteen to a hundred fathoms deep. There is a road on each side to Killin, the distance being sixteen miles. Both abound alike in fine scenery, though by pursuing that along the south side, a view will be obtained of the lofty Ben Lawers, which will scarcely be seen in such perfection on the opposite side. The mixture of wood, rock, and cultivated field, which the traveller finds skirting Loch Tay, will surprise him with its happy effect. The old system of minute farms prevails here in all its pristine vigour, and a prodigious number of rude and picturesque cottages necessarily enter into the composition of the landscape.

Killin, a straggling little village, situated in the low vale at the head of the loch, is celebrated for the varied beauty of its scenery. Here two rivers, the Dochart and the Lochy, come down out of different glens, and join their waters with each other and with the lake. The vale of the latter is peculiarly beautiful; but that of the Dochart, extending up to Tyndrum, upon the great west road, is only stern and wild. On arriving at the town, the Dochart breaks over a strange expanse of table rock in a thousand little cascades, so that the traveller, who crosses a bridge just at the place, is bewildered, as he looks around, with the flashing and sparkling water which everywhere meets his eye.

"Killin," says Dr. M'Culloch, "is the most extraordinary collection of extraordinary scenery in Scotland, unlike every thing else in the country, and perhaps on earth, and a perfect picture-gallery in itself, since you cannot move three yards without meeting a new landscape. A

easy artist might here draw a month, and not exhaust it. It is indeed scarcely possible to conceive so many distinct and marked objects collected within so small a space, and all so adapted to each other as always to preserve one character, and, at the same time, to produce so endless a number of distinct and beautiful landscapes. To find, however, all that Killin has to give of this nature, it is necessary to try about into corners, like a cat; as the separate scenes are produced by very slight changes of position, and are often found in very unexpected places. Fir-trees, rocks, torrents, mills, bridges, houses—these produce the great bulk of the middle landscape, under endless combinations; while the distances more constantly are found in the surrounding hills, in the varied woods, in the bright expanse of the lake, and the minute ornaments of the distant valley, in the rocky and bold summit of Craig Caillench, and in the lofty vision of Ben Lawers, which towers like a huge giant to the clouds, the monarch of the scene."

On the north-west shore of Loch Tay, near Killin, stands the mouldering ruin of Finlarig Castle, built by Sir Colin Campbell of Glenurchy between 1513 and 1523, and the seat of the family before their removal to Balloch or Taymouth. "We observe also," says a traveller, writing in 1802, "situated on a plain at the west end of the lake, a neat but small mansion (Kinnel), belonging to Mr. M'Nab, the chieftain of that name. The family burial-ground, *Inish-Mhui*, close by the house, is pointed out to the stranger as a place of singular beauty. It undoubtedly is such, and is highly calculated to raise ideas of tenderness and sorrow; as an insulated grove of tall pines, whose solemn aspect and deep silence are in fine harmony with the waters around it, the blue expanse of the lake calm and unruffled, and the sublime height of the mountains that rise from its margin are objects well suited to correspond with the belief that Fingal sleeps here in the dust."

Dunbartonshire.

A tract of beautiful scenery extends through this county, from the banks of the Clyde along those of the Leven, and including the magnificent Loch Lomond, the largest and probably most beautiful of our British lakes.

At the starting point, in an angle formed by the confluence of the Leven and Clyde, is a basaltic mass shooting up to the height of 560 feet above an alluvial plain. This affords a site for the celebrated *Dunbarton Castle*, a romantic fortress, noted in Scottish history, and one of four kept in repair in terms of the Act of Union. Passing the town of Dunbarton, the tourist proceeds upwards along the vale of the Leven, a scene of singular beauty, filled with thriving villages and elegant mansions. The road, at the distance of two miles from the town, passes the old mansion-house of Dalquharn, in which, in the year 1721, the author of Roderick Random first saw the light. Archibald Smollett, the father of the novelist, was the fourth son of Sir James Smollett of Bonhill, and, having married against his father's will, was residing here, in possession of one of the farms of the family property, at the time of the birth of his illustrious child. In a field on the opposite or west side of the road, there is an obelisk to the memory of the novelist, erected and inscribed by his cousin-german, James Smollett of Bonhill. Immediately beyond, the road passes through the populous modern village of Renton, occupied by persons engaged in the neighbouring bleachfields, and taking its name from that of a lady married into the Smollett family. This, and another similar village named Alexandria, a little farther on, together with the appearance of various works on a large scale scattered over the landscape, testify that industry of a different kind from that which becomes "embrowned with toil," has taken possession of the limpid waters of the Leven, to which, therefore the beautiful ode of Smollett is no longer strictly applicable. Bonhill, the ancient seat of the novelist's family is opposite to Alexandria. Several other mansions of handsome appearance enliven the road before it arrives at *Balloch* (town at the foot of the lake), a small village and inn at the southern extremity of Loch Lomond, four and a quarter miles from Dunbarton. From this place a steamer, on earth at least "yclept Euphrosyne," starts every morning to conduct tourists along the lake.

Loch Lomond measures twenty-three miles in length from north to south; its breadth, where greatest, at the southern extremity, is five miles, from which it gradually grows narrower between the enclosing hills, till it terminates in a mountain streamlet. The whole aqueous surface is calculated at 31¼ square miles, or 20,000 English acres, and it is studded by above thirty isles, mostly at the southern extremity. These islands, together with the shores of the lake, are in general clothed with dark wood, which gave occasion to a distinction very judiciously drawn a few years ago by a Swiss tourist between Lausanne and Loch Lomond: "Our lake," he said, "is the fair beauty—yours the black." The first isle that occurs is a long narrow one named *Inch Murrin*, at the southern extremity of which there is an old ruined fortalice, called Lennox Castle, said to have formerly been a residence of the Earls of Lennox. This isle is now the property of the Duke of Montrose, who employs it for the keeping of deer. In succession from Inch Murrin, towards the north-east, occur *Inch Cro* (the isle of cattle), *Torr Inch* (the wood isle), and *Inch Caillach* (the island of women, having been the site of a nunnery). On the south side of Inch Caillach, is *Clar Inch* (flat island), a very little member of the archipelago; at the north end the ruins of a castle are to be seen under water, testifying that the surface of the lake must have risen in the course of ages. Inch Caillach, which formerly gave name to the parish of Buchanan, and was the burial-place of the Macgregors, has on its north side *Inch Fadd* (long island), which bears grain and pasture, and near which is *Ellendarroch* (the small rugged island). Another group, to the northward, stretch between the peninsula of Rossdoe, on the west side of the lake, and Strathcashel Point, on the east: *Inch Tavanagh*, the first in this group, and which derives its name from having once been the residence of a monk, contains 150 acres, partly covered with wood; it is the highest island in the lake. At a little distance to the south, the ruins of Galbraith Castle, once the residence of a family of that name, start up from the water. To the east of Inch Tavanagh are *Inch Conagan*, covered with oak and fir, and *Inch Moan*, a low isle correctly described by its name, which signifies the island of moss. Still farther to the east are *Inch Cruin*, on which is an asylum for insane persons, and *Buc-inch* (goat island). North from these lies *Inch Lonaig*, 150 acres in extent, and bearing many old yews, formerly of great use in furnishing the materials of bows and arrows. Of the whole thirty islands, the remainder are unimportant. South of Luss, the depth of the lake is rarely more than 20 fathoms: in the northern and narrower part it ranges from 60 to 100 fathoms; and in the places where deepest never freezes. In ancient times, Loch Lomond was famed for three wonders—"waves without winds, fish without fins, and a floating island." The first phenomenon is attributed to a peculiar atmospheric effect, not easily described, but which has also been observed on the Cumberland lakes; vipers swimming from island to island account for the second; the floating island is supposed to have been a detached fragment of moss, or a matted mass of aquatic plants, which ultimately fixed itself near the west side of Inch Conagan. The lake abounds in delicious fish.

Loch Lomond is skirted on the west side by the road

from Dunbarton to Inverary. Less than a mile from the lower end of the lake, this road passes Cameron House, long the seat of the Smolletts of Bonhill, and described as such in the novel of *Humphry Clinker*, where we have many panegyrics upon its scenery. A little farther on, the fine modern mansion of Belretiro overhangs the road upon the left. Here, through a fine vista, appears the polished expanse of Loch Lomond, its large islands, and the soft hills in the distance—a view that never fails to arrest the attention of the traveller. The objects that crowd into this scene are so finely diversified in form, in situation, and in colour, as to compose a picture at once beautiful and impressive. At the seventh mile-stone, upon the left, is Arden, the property of H. Buchanan, Esq., environed with woods, and placed at the bottom of a lofty hill, called *Dunfion*, or the hill of Fingal, tradition reporting it to have been one of the hunting seats of that hero. Somewhat farther on, and passing Nether Ross upon the left, the traveller crosses a small river called the Water of Fruin, which falls into the lake. It rises in *Glenfruin*, or Vale of Lamentation, so called, it is said, from a dreadful slaughter of the Colquhouns by the Macgregors, in 1602, and on account of which the Macgregors were, for nearly two centuries, unceasingly persecuted by government. The promontory of *Rossdoe*, which forms a beautiful situation for the mansion of the same name (Colquhoun of Luss, Bart.), is then passed; after which a scene of uninterrupted beauty continues all the way to Luss, twelve miles from Dunbarton.

Luss, a delightful little village, on a promontory which juts into the lake, is much resorted to in summer, on account of its being a convenient station for tourists in search of the picturesque. One of the finest points for enjoying the scenery of Loch Lomond and the environs of Luss, is Stronehill, to the north of the village. At this point, about one-third of the way up a lofty hill, the whole breadth of the lake is spanned by the eye, including

> ——"all the fairy crowds
> Of islands which together lie,
> As quietly as spots of sky
> Among the evening clouds."

From this point, the isles appear distinctly separated from each other, but not so much so as to give the idea of a map or bird-eye view, which a higher point of view would undoubtedly present. The prospect is bounded on the south by the distant hills which intervene between Loch Lomond and the Clyde, and which here appear, in comparison with the mountains around, to be only gentle swells; the Leven, its vale, the rock of Dunbarton, and even the surface of the Clyde, are in the same direction conspicuous. Towards the east, the vale of the Endrick, its principal seats, the obelisk erected to the memory of Buchanan at Killearn, and the Lennox hills, are also distinctly visible. Turning to the north, the lake is seen to wind far away among the mountains.

At *Inveruglas*, three and a half miles beyond Luss, there is a ferry to Rowardennan Inn, the usual starting-point for those who desire to ascend to the top of *Ben Lomond*. This mountain, situated in the county of Stirling, is 3240 feet above the level of the lake, which is 22 above the level of the sea. At Rowardennan, when looking northward, it almost completely fills up the view. It consists in three great stages, each rising above the other; these again are divided into a number of lesser swelling knolls, some of which are covered with heath and crags, while others are verdant and smooth. The distance from the inn to the top of the mountain is six miles of a continued ascent, which, in general, requires about three hours. From the summit, a varied and most extensive prospect opens upon the eye in every direction. The lake, lately contemplated with so much pleasure, now appears a small pool, and its rich and diversified islands as so many specks upon its surface. Beyond it, and to the left, appear the vale of the Endrick, the distant county of Lanark, its towns, and the mountain of Tinto; directly south, the outlet of the lake, the river Leven, its winding and rich banks, the Castle of Dunbarton, and the counties of Renfrew and Ayr; nearly in the same direction, the Firth of Clyde, the rock of Ailsa, the islands of Arran and Bute, with the more distant Atlantic. The coasts of Ireland and the Isle of Man are, when the atmosphere is clear, within the boundary of the view. To the east are seen the counties of Stirling and the Lothians, with the windings of the Forth, and the Castles of Stirling and Edinburgh. The prospect to the north is marked by grandeur alone. Immense mountains, piled as it were above each other, and extending from the borders of Stirlingshire to the western ocean, with the indentations of the coast on one side and the lakes of Perthshire on the other, form altogether a scene which may be conceived, but cannot be properly described.

Ben Lomond has this remarkable advantage as a hill, that it is not overcrowned or crowded up with surrounding hills. It seems to be sole monarch of a vast undisputed territory. Nowhere, therefore, is there a better idea to be obtained of the Highland country than on its summit. The mountain itself, besides, affords a great variety of scenery. To the south it stretches out into a slope of a very gentle declivity. The north side is awfully abrupt, and presents a concave precipice of many hundred yards in depth. He must possess firm nerves who can approach the brink and look down unmoved. The rock is said to be 2000 feet in sheer descent.

About four and a half miles to the north of Inveruglas, the Dunbarton and Inverary road reaches the lonely but comfortable inn of Tarbert, where there is also a ferry by which Ben Lomond may be approached. At this inn the road leaves the shore of the lake, and proceeds to the westward by the head of Loch Long, and so into Argyllshire. At Inversnaid Mill, there is a little cataract, the scene alluded to by Wordsworth in his address to a Highland girl—

> "Sweet Highland girl! a very shower
> Of beauty is thy earthly dower."

On the heights above, beside the way to Lock Katrine are the remains of Inversnaid Fort, erected by the government in 1713 to check the turbulence of the Macgregors: near it is a little burial-ground, in which the garrison had interred their dead, and containing one or two monuments, which have long forgot to tell the familiar tale confided to them. The fort was taken by Rob Roy in 1716, but afterwards regained and re-established. It is said that the amiable General Wolfe at one time resided in it.*

Firth of Clyde.—Argyllshire.

This is a tract of scenery much admired and visited, on account of its presenting a fine combination of inland seas with islands of varied surface and chains of rugged mountains.

* "On the east shore of Loch Lomond, and the west side of Ben Lomond, or what is called *Craigrostan*, a narrow alpine road conducts through scenery of gigantic features. Here tradition, countenanced by Barbour, has assigned to Robert Bruce a cave, in which he sojourned a night when passing from Strathfillan after the nearly fatal combat with Macdougal of Lorn. Here too, a steep shelving rock is pointed out as what is called '*Rob Roy's Prison*,' where that Highland laird is reported to have stowed such of his vassals as he had adjudged to durance. One of his tenants had not paid his rent when it became due. Rob, suspending him on a rope by the shoulders, let him down into the fastness. Having drawn him up at the end of twenty-four hours, he told him that, if he failed to pay by a particular time, he should draw him up by the neck. North of Craigrostan is what is said to have been used by him as his cave. It is a wide subterraneous recess, formed by a huge avalanche of the mountain. Here, according to tradition, he rendezvoused with his followers."—*Stirling's edition of Nimmo's Stirlingshire.*

The Clyde expands into an estuary a little way below Dunbarton. There, while the comparatively low hills of Renfrewshire, with the thriving towns of Port-Glasgow and Greenock, are seen on the left, attention is called on the right to the towering alps of Argyllshire, sometimes ironically called the Duke of Argyll's Bowling-Green. The Argyllshire shores are here decorated with a long succession of villas, the favourite summer residences of the more affluent citizens of Glasgow. This mountainous region is penetrated by several inlets of the sea, one of which, named Loch Long, is twenty-four miles long. Another named the Holy Loch, is shorter, but surrounded by equally picturesque ground. There is also an inland lake, Loch Eck, which presents very beautiful scenery.

Separated from this rugged district by only a narrow strait, is the island of *Bute*, displaying features only a little less highland, and remarkable for the amenity of its climate, on which account it is much resorted to by persons affected with pulmonary ailments. It measures fourteen miles in length by about four in breadth, and contains some beautiful strips of level territory, in one of which is situated the mansion of the Marquis of Bute. The beautiful town of Rothesay, a favourite sea-bathing station, occupies a fine situation on the north-east extremity of the island. Here are the ruins of a palace which formed the ordinary residence of the earliest sovereigns of the house of Stuart. The *Kyles of Bute*, as the strait above mentioned is named, is remarkable for the fine vistas of alpine scenery which it opens up to the view of the tourist.

To the south of Bute lies the island of *Arran*, twenty-two miles long, and which entirely consists of a range of rocky mountains, the serrated outline of which, as seen from the neighbouring seas and shores, is extremely grand. The loftiest summit, Goat-fell (called by the natives *Goath-bhein*, the hill of storms), is 2800 feet high. Arran bears great value in the eyes of the geologist, on account of its presenting, within a narrow space, an epitome of the whole geological structure of Scotland. Its pathless glens and picturesque hills commend it equally to visiters who do not inquire into the mysteries of stratification and volcanic agency. The whole island, excepting a few small farms, belongs to the Duke of Hamilton, whose ancestor, James first Lord Hamilton, obtained it from the crown on his marrying Mary, the eldest daughter of James II., in the year 1474. There are now a number of large farms enclosed, subdivided, and well cultivated, having fine stocks of cattle and comfortable farm-steadings, where formerly there were numerous huts without chimneys or windows, and ridges running in all directions without a single enclosure or subdivision. At the north end of the island, under the lofty and isolated summit called the Cock of Arran, a small bay, denominated Loch Ranza, serves as a natural harbour, in which capacity it is turned to great advantage in the herring fishery. On the shore of the bay there are a few scattered houses, an inn, an ancient castle in ruins, and a preaching station. A road sweeping round the east shore of the island leads to Brodick Bay, at the bottom of which there is a beautiful tract of low and sloping ground, ornamented with some fine wood, containing a hamlet, which forms a favourite resort for sea-bathing. On the adjacent height, amidst ancient woods, is the ancient chateau of Brodick, a mansion of the Duke of Hamilton. From this place a road strikes across the island, and opens up some magnificent scenery. Two or three miles to the southward of Brodick, the shore forms the more spacious recess of Lamlash Bay, at the bottom of which is a village of the same name, while it is landlocked in front by Holy Island, a small isle which formerly contained a monastery. Lamlash Bay is of great importance to the navigation of the Clyde and Irish Channel, as an unfailing retreat for distressed vessels.

Loch Fyne, a long narrow estuary, having the ridgy promontory of Kintyre on the one side and the district of Cowal on the other, opens up much fine scenery. In sailing up the loch, the first remarkable place is Tarbert, a fishing village situated at the bottom of a beautiful small bay, with a ruined fortalice of the Argyll family perched on a rock by its side. Farther up the loch is Inverary, the beautifully situated, village-like county town, chiefly forming a mere dependency of the neighbouring Inverary Castle, the principal seat of the ancient and illustrious house of Argyll. The rugged sylvan scenery around this mansion, with its views of seas, mountains, and distant islands, excite general admiration. Between Inverary and the inn of Tarbert on Loch Lomond, a road opens up a splendid tract of mountain scenery, the most striking being comprehended in the valley of Glencroe. Another road, proceeding in a northerly direction, leads to Loch Awe, an inland lake possessing many fine features, and upon which stands the ruined castle of Kilchurn, once the chief stronghold of the Breadalbane family. The loch is overhung by Ben Cruachan, a mountain 3390 feet in height, on the skirts of which King Robert Bruce gained a victory over his powerful enemy, the Lord of Lorn.

The northern portion of Argyllshire, where it is bounded by the western ocean and its many inlets, contains much fine scenery. In a sheltered situation on the west coast, stands the neat and cheerful town of Oban, a point of rendezvous for the numerous steamers permeating these seas, and a kind of entrepôt for the rural produce of the wide district around it. In front is the isle of Kerrera, where Alexander II. died in the course of an expedition to the western islands. On the coast, a little to the north of Oban, is Dunolly Castle, the mansion of the Macdougals of Lorn, and a little way farther north is Dunstaffnage, an ancient seat of the Caledonian kings, occupying a commanding site on the top of a rock overlooking the sea.

Loch Linnhe, opening between Lorn and Morven, and the commencement of the chain of salt and fresh water lakes formed into the Caledonian Canal, presents on both sides scenery of a most romantic character—a mixture of bold rocky forelands, on many of which are perched the eyrie-like fortresses of the rude chiefs of the olden time, and green smiling hollows, within bays, where the elegant habitations of a modern gentry have been placed. The long island of Lismore, in the mouth of this estuary, was the ancient appanage of the bishops of Argyll, and temporarily the site of a college for Catholic priests, after the French seminaries were closed by the Revolution; but is now only remarkable for the great quantity of limestone exported from it. Opposite to its upper extremity, Loch Creran, a sub-estuary, branches off into the land of Lorn, opening up much beautiful scenery. On the south shore of Loch Linnhe, to the north of the opening of Loch Creran, is the district of Appin, previous to 1765 the property of a race of Stewarts, descended from a natural son of the last Lord Lorn, and for four centuries conspicuous in Highland history. In this district, the first mansion which occurs to the north of Loch Creran is Airds, the seat of Sir John Campbell. Next is the ruin of Castle Stalker, an ancient massive building. Appin House, the seat of Mr. Downie of Appin, next occurs; and after that, at the mouth of Loch Leven, Ardshiel (Stewart, Esq.). From Ballahulish Ferry on Loch Leven, noted for its great quarry of slate, the west Highland road penetrates the savage vale of Glencoe.

Glencoe opens a little to the north of a solitary inn called the King's House, and extends about ten miles in a north-westerly direction to Ballahulish. It may be described as a narrow strip of rugged territory, along which hurries the wild stream of Cona, celebrated by Ossian, who is said to have been born on its banks. Ga

each side of the narrow banks of this river, a range of stupendous hills shoots perpendicularly up to the height of at least 2000 feet, casting a horrid gloom over the vale, and impressing the lonely traveller with feelings of awe and wonder. The military road sweeps along the right side of the glen. From the sides of the hills an immense number of torrents descend, sometimes sweeping over and spoiling the road, which is always, therefore, in a very precarious state. From the one end of the vale to the other, only one human habitation is to be seen; and as it is not a road of much currency, the traveller may pass through it without meeting a single human being. The goats scrambling among the rocks, and the wild eagle hovering about the tops of the wall-like hills, are usually the only living objects within sight; and, as may be conceived, these rather increase than diminish the wildness and desolation of the scene. The place where the famous massacre of Glencoe happened, is at the north-west end of the vale.

Inverness-shire.—The Great Glen.

Between Loch Linnhe on the west coast and a point on the Moray Firth near Inverness, there is a remarkable natural phenomenon, in the form of a glen or hollow, passing in a perfectly straight line for sixty miles through a mountainous region, and the bottom of which is nowhere more than ninety feet elevated above the level of the sea. It is called by the Highlanders *Glenmore-nan-Albin* (the Great Glen of Scotland). A chain of lakes extending along this extraordinary hollow suggested the formation of a canal which should admit of navigation between the seas on the two sides of the island, and save the dangerous passage round by the Pentland Firth, and this, under the name of the *Caledonian Canal*, was formed between 1803 and 1822, under the care of Mr. Telford, at an expense of £800,000. This line of communication has not proved so useful as was contemplated; but, by admitting of a line of steamers between Inverness and Glasgow, it has been the means of allowing a vast number of persons to enjoy the magnificent scenery through which it passes.

The canal commences at Clachnaharry, in the outskirts of the town of Inverness, and, after six miles, enters the first of the chain of lakes, *Loch Ness*, a grand piece of water, twenty-three miles long, situated amidst stupendous and sterile mountains. The waters of Loch Ness never freeze, but they are often agitated simultaneously with the occurrence of earthquakes in distant parts of the world. On an elevated rock projected into the north-east margin of Loch Ness, are situated the remains of Urquhart Castle, consisting of a great square keep and several exterior walls of defence. It was besieged in 1303 by the officers of Edward I., and with great difficulty taken; it afterwards was a royal fortress; and, finally, in 1509, it became the property of Grant of Grant, ancestor of the Earl of Seafield, to whom it now belongs. Glen Urquhart, which recedes behind Urquhart Castle, is a beautiful Highland vale, sometimes likened to Tempe, and containing many gentlemen's seats and a good inn. The conspicuous mountain, *Mealfourvonie* (hill of the cold moor), upwards of 3000 feet in height, here begins to raise its huge bulk above the banks of the loch. About 500 feet from the summit, there is a lake about a mile long, which cannot be much less than 3000 feet above the level of Loch Ness. On the top of the hill there is a cairn, the accumulation of which must have been a work of great labour. Mealfourvonie stands so prominently above the neighbouring herd of hills, that it is not only singled out by the eye at Inverness, but is the first landmark seen on entering the Moray Firth, at the distance of a hundred miles.

The road along the south side of Loch Ness, though it presents numberless fine views, is enlivened by few traces of man's presence. The paucity of houses gives a sort of distinction to the inn named General's Hut, nearly eighteen miles from Inverness, originally the residence of General Wade, while superintending the formation of his roads. Little more than a mile farther on, a recess or chasm in the hill by the side of the lake contains the celebrated *Fall of Fyers*. At the bottom of the recess there is a smooth little plain, descending upon the lake, ornamented by the house and shrubberies of Fyers, and where the steamers usually disembark such passengers as may desire to behold the waterfall. A path accessible to carriages, winds backwards and forwards, up the face of the hill, till the height of the public road is reached; and then there is a pathway leading down the face of the crags, towards a projecting rock, on which visiters usually stand to see the fall. The Fyers is not a very copious stream, except in rainy weather; consequently there are great variations in the aspect of the cascade. In its medium fullness, it pours through a narrow gullet in the rock, in a round unbroken stream, which gradually whitens, as it descends, till it falls into a half-seen profound, usually described as two hundred and forty feet below the point of descent, though this is supposed to be an exaggeration. A dense mist is constantly seen rising from the broken water, like the heavenward aspirations of an afflicted and tortured spirit. The noise is usually very loud. About a quarter of a mile farther up the ravine, there is another cascade, usually called the Upper Fall—a fearful gulf, down which the water descends by three leaps, and over which a bridge has been thrown, by way of station for a sight of the cataract. All this stupendous ravine is covered by birches, on whose every leaf a pearl of vapoury dew is constantly hanging.

A few miles farther on, *Glenmorrison* opens upon the north-west bank of Loch Ness. It is a valley full of romantic scenery, and belongs to a branch of the family of Grant. While the steam-borne traveller necessarily pursues the route by the lake, the traveller by the south road, after passing Fyers, leaves the brink of that piece of water, and advances into *Stratherrick*, a long valley behind the line of hills which overlook Loch Ness. A secluded valley, called Killean, opening upon this part of the road near Whitebridge, is spoken of as a singularly secluded and romantic piece of scenery. At the distance of thirty-two miles from Inverness, the road descends upon Fort Augustus and the little village of Killicumming, so called as the burying-place of the Cummings, lords of Badenoch.

Fort Augustus, situated in a pleasant opening amongst the hills, at the termination of Loch Ness, was erected in 1730, as an addition to the means previously existing for the control of the turbulent children of the mountains. Its purposes being long since accomplished, it has for many years been only occupied by two or three artillerymen. From Fort Augustus, the cut of the canal is resumed, and several locks are ascended; a very few miles brings it to *Loch Oich*, the smallest of the chain of lakes. The scenery is here finer than at any other part of the Great Glen. On the north-west bank of the loch is Invergarry, till a recent period the residence of the chief of Glengarry, a handsome modern building, in the immediate neighbourhood of an older mansion, which has been in ruins since burnt down by the king's troops in 1746, in consequence of the part taken by the chief in the rebellion.

The next and last loch is *Loch Lochy*, the hills environing which are the most hopelessly wild and stupendous of all in the glen. The summit level of the canal between Loch Oich and Loch Lochy, being ninety feet above the ordinary high-water mark at Fort William, and ninety-four above that at Inverness—a difference to be accounted for by the pressure of the Atlantic on the west shores of Scotland. The lonely little inn of Letter

Findlay is the only house at first seen on Loch Lochy; but when the west end is nearly reached, the traveller discovers, in a recess on the right side, the house of Auchnacarrie, which was the residence of the gallant and unfortunate Locheil, before he entered upon the fatal campaign of 1745. The canal, after leaving this loch, descends in a precipitous series of locks, called *Neptune's Staircase*, into Loch Eil, a continuation of Loch Linnhe, the arm of the sea formerly mentioned.

At this point the glen is more spacious than anywhere else. It is, however, the spaciousness of a moor. The River Lochy, which issues from the lake of the same name, pours its voluminous and impetuous flood towards Loch Eil on the left; and beyond it Ben Nevis is seen to rear his enormous head, with the vale of Glen Nevis withdrawing from his mighty side into the solitudes of Lochaber. At the distance of little more than a mile is the town of Fort William, so called from a fortress of the same name built for the repression of Highland turbulence, and now nearly disused.

A cluster of glens to the south of the Great Glen, is remarkable for a natural phenomenon, usually called the Parallel Roads of *Glenroy*, such being the name of the vale in which the wonder is most conspicuously marked. It consists of a set of terraces, in most places three in number, extending along both sides of these vales for many miles, the uppermost 82 feet above the second, which, again, is 212 feet above the first. The common people represent these terraces as roads formed at the command of Fingal, an early hero, for his convenience in hunting; but they are in reality ancient beaches of inland seas, raised into their present position by successive upheavals of the land—phenomena with which modern geologists are familiar.

Western Islands.

The Western Islands are generally bleak and rugged in surface, and occupied by a very poor class of tenantry. In some of them, particularly in Skye and Eigg, the scenery attains to a savage grandeur. It is not possible here to present a particular description of any besides the Isle of *Staffa*, so remarkable for its basaltic structure. It is about a mile and a half in circumference, and bears no human habitation, its only useful tenants being a small herd of black cattle. At the point of greatest elevation, towards the south-west, this island is 144 feet high. On the north-east it presents a face of somewhat less height, composed of basaltic columns, and penetrated by several caves of various sizes, into which the sea occasionally breaks with the report of thunder. This face, according to Dr. Macculloch, is formed of three distinct beds of rock, of unequal thickness, inclined towards the east in an angle of about nine degrees: the lowest is a rude trap tufa; the middle one is divided into columns placed vertically to the planes of the lowest bed; and the uppermost is an irregular mixture of small columns and shapeless rock—the whole being partially covered by a fine verdure. The central columnar part having in some places given way, is the occasion of the numerous caves by which the island seems perforated.

At the north-east point of the island, the dipping of the rocks is so low as to afford a safe landing-place at any time of the tide. Proceeding thence, the visiter is conducted along the north-east face, and is introduced to the *Clam-shell* (Scallop) *Cave*, where a curious confusion in the columnar structure is observable. The columns on one side are bent, so as to form a series of ribs not unlike the inside view of the timbers of a ship; while the opposite wall is formed by the ends of columns, bearing a general resemblance to the surface of a honeycomb. This cave is 30 feet in height, and 16 or 18 feet in breadth at the entrance; its length being 130 feet, and the breadth contracting to the termination. Next occurs the noted rock, *Buachaille* (the herdsman), a conoidal pile of columns, about 30 feet high, lying on a bed of curved horizontal ones, visible only at low water There is here an extensive surface, resembling that of the Giant's Causeway, and composed of the broken ends of pillars once continuous to the top of the cliff. The colonnade is now for some distance upright and very grand, till the visitor reaches the *Uaimh Binn* (Musical Cave), usually called *Fingal's Cave*, by far the most impressive and interesting object in the island. It opens from the sea with a breadth of 42 feet, a height of 66 feet above the water at mean tide, the pillar on one side being 36 feet high, and that on the other 18. The depth of the recess is 227 feet, and the breadth at the inner termination 22. The sides within are columnar throughout; the columns being broken and grouped in many different ways, so as to catch a variety of direct and reflected tints, mixed with secondary shadows and deep invisible recesses. As the sea never ebbs entirely out, the only floor of this beautiful cave is the fine green water, reflecting from its white bottom tints which vary and harmonize the darker tones of the rock, and often throwing on the columns flickering lights, which its undulations catch from the rays of the sun without.

Fingal's Cave, Isle of Staffa.

ANTIQUITIES.

There are in Scotland, and particularly in the district between the Firth of Tay and Moray Firth, numerous mounds, upright slab stones, and carved stones, which are supposed to have been raised as monuments over slain warriors, by the early inhabitants of the country, or by the Danes or other northern nations who occasionally invaded it in remote times. The most remarkable examples of mounds are two at Dunnipace on the Carron, in Stirlingshire, and one at Fettercairn, in Kincardineshire.

A distinct class of mounds, called *moot* or *moat hills*, are common in the south-western and several other districts. They are generally of a square form, with a flat top. It is believed that they served as places for the administration of justice in rude ages.

Of the carved stones, a remarkable example exists at Forres. It contains figures of men and animals, in various compartments. There is another very entire and curious specimen at Aberlemno in Forfarshire. A third at Meigle is remarkable as containing a representation of one of the war-chariots used by the original inhabitants of the country.

In the north of Scotland, and in Orkney, there are some surviving examples of a very remarkable class of early buildings, to which the common people now give the name of *Picts' Houses*, as supposing them to have been built by the Picts. They are generally round buildings, of no great height, with round vaulted tops, altogether built of courses of dressed stone without mortar

and containing for the most part one central chamber, and several long narrow recesses in the thickness of the wall.

Circular mounds, the remains of British and Danish camps, are common on the tops of the Scottish hills, having probably been the places to which the early people retired with their flocks in times of danger. On several hills, particularly in Perthshire and Inverness-shire, there are remains of walls, presenting appearances as if the stony materials had been artificially vitrified. It is not yet clearly ascertained whether these *vitrified forts*, as they are called, were works of our Caledonian ancestors, or the effect of accident, though the former is certainly the more likely supposition.

The weapons used by the aboriginal people are often found, consisting of stone axes, arrow-heads of flint, &c. Necklaces, bracelets, and other ornaments used by them, barbarous in style, but generally of gold, are also often found. In various districts, Druidical circles still exist in a tolerably entire state; but none on so large or regular a scale as those of Stonehenge and Abury.

There are remains of roads and camps formed by the Romans in their hesitating and imperfect attempts to subdue North Britain; and of the wall built under the Emperor Antoninus, between the Firths of Forth and Clyde, with forts at regular intervals, it is still possible to discern a few traces.

The next class of antique objects are the remains of the Gothic fanes, reared on account of religion during the period when the Romish church was triumphant. These are everywhere very numerous, but in few cases tolerably entire. Excepting two cathedrals, those of Glasgow and Kirkwall (in Orkney), all of that class of structures are in ruins. The abbeys, priories, and other conventual and collegiate establishments, are in every instance gone to decay. Melrose Abbey, the Cathedral of Elgin, and the Collegiate Church of Roslin, are the most beautiful of these ruinous buildings.

Melrose Abbey.

Numerous specimens of the towers and castles occupied by men of note in the middle ages, still exist, though mostly in a decayed state. Those which indicate the greatest strength and consequence are—*Lochmaben Castle*, the residence of the Bruces, Lords of Annandale; *Hermitage* (Roxburghshire), which belonged to a powerful noble named Lord Soulis; *Douglas*, the residence of the Earls of Douglas; *Turnberry* (Ayrshire), the residence of the Earls of Carrick; *Bothwell*, another stronghold of the Douglases; *Tantallon* (Haddingtonshire), the residence of the Earls of Angus, a branch of the Douglas family; *Dunnottar* (Kincardineshire), the seat of the Earls Mareschal; and *Doune* (Perthshire), the stronghold of Robert Earl of Fife, brother of Robert III., and governor of Scotland. Four places of strength, *Edinburgh*, *Stirling*, *Dunbarton*, and *Blackness Castles*, are still kept in repair at the public expense, and serve as barracks for foot soldiers.

MANSIONS.

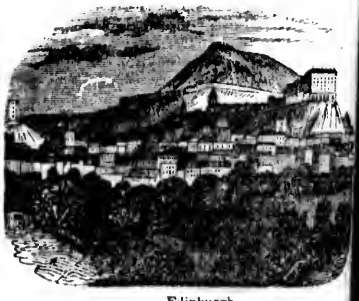
The mansions of the nobility and gentry of Scotland do not differ in any important respect from similar classes of structures in England. The "hall" is, however, completely wanting in Scotland, and there are comparatively few specimens of the Elizabethan style. Turbulent times being more recent in Scottish than in English history, the chief mansions of an unfortified character in the northern kingdom are not of earlier date than the reign of Charles II., and most of them are much later. In many instances, the whole or part of the original castellated buildings which stood on the same site are retained.

Before the reign of James III. (1460–1488), there seems to have been no mansion besides the regular tower, with its surrounding inferior buildings, and external wall or barmkyne. In that, and one or two of the ensuing reigns, a few mansions were built, in an ornamental style, having, for instance, an elegant front looking inwards to a quadrangular court; yet, in these instances, the outside of the building was still a plain and almost dead wall, calculated for defence. *Crichton Castle* (Edinburghshire), and *Linlithgow Palace*, are examples. In the reign of James VI., the favourite style was the tall square tower; but this was now rendered somewhat more ornamental by means of sundry flourishes, such as minor towers projecting like pepper-boxes from the corners. *Glammis Castle* (Forfarshire) is a superb specimen of this class of mansions.

In the reign of Charles II., mansions were for the first time built in any thing like pure Grecian taste. This was introduced by Sir William Bruce of Kinross, Bart., an architect of considerable skill, and of whose works the modern Holyrood Palace, and his own house of Kinross, are examples. During the last century, the mansions built in Scotland have partaken of all the changes of taste passing through England, from the heavy barrack-like structures of Sir John Vanburgh, to the light and elegant Grecian style of Adam. We have new chateaux in the style of the middle ages (*Gordon Castle*, Banffshire, and *Colzean* in Ayrshire); Grecian structures by Adam (*Hopetoun House*, Linlithgowshire); mansions in the Doric and more sombre Grecian style since introduced (*Hamilton Palace*, a superb example); and, very lately, a few specimens in the priory and Elizabethan styles.

CHIEF TOWNS.

Edinburgh, the capital, is situated in the county of the same name, on a cluster of eminences, distant between one and a half and three miles from the Firth of Forth.



Edinburgh.

The city is composed of two principal parts, the Old and New Towns, the former being built on a long narrow

eminence gently rising towards the west, where it terminates in a lofty and abrupt rock, on which the Castle is situated, while the latter occupies lower ground towards the north. The town is universally built of a fair sandstone, which retains its original colour in the newer parts of the town and in the best public buildings, and forms one of the most important features of Edinburgh. The New Town is laid out on a regular plan of rectangular streets and squares, exhibiting in general much architectural elegance. Between the Old and New Towns, and between various sections of the New Town itself, as well as in the centres of the principal squares, there are gardens laid out in the modern landscape style, forming delightful places of recreation. It is chiefly owing to the unequal ground on which Edinburgh is situated, the massive elegance and regularity of its buildings, the intermixture of ornamental pleasure-ground, and the picturesque hills immediately adjacent, whence distant and extensive prospects are commanded, that this city makes so great an impression on most strangers.

Formerly the seat of the government of the country, Edinburgh is still that of the supreme law-courts and of a flourishing university. It is also to a great extent a city of residence, not only for affluent persons connected with the country, but for strangers desirous of enjoying a society of moderate habits, and the benefits of education for their children. Its leading classes are thus composed of legal practitioners, learned persons, and families in independent circumstances. It is only in a small degree a manufacturing town, the principal trades being the brewing of ale (for which the town is celebrated), coachmaking, the weaving of shawls, and the printing and issuing of literary productions. The leading periodical publications are the well-known Edinburgh Review, Blackwood's and Tait's Magazines, and a Philosophical and Medical Journal, besides which there are a number of smaller size. The town is distinguished for its numerous banking institutions, which exert an influence on the general trade of the country. Within a few miles of the city, on the Esk River, there are various paper-mills, at which vast quantities of paper are made, both for the home trade and for exportation to London. A railway in course of execution to Glasgow is expected to prove of great benefit to both cities.

Amongst the remarkable objects in the city, the most striking is the Castle, a large fortress romantically situated on the summit of a mass of igneous rock, between two and three hundred feet in sheer height. It contains, besides various batteries and other fortifications, an ancient palace, in which Queen Mary was delivered of her son James I. of Great Britain, and a modern barrack, in which a foot regiment is usually quartered. In a well-protected room, are shown the crown, sceptre, mace, and sword, which formed the regalia of the Scottish line of princes. The Courts of Law are situated in the centre of the Old Town, and are composed of a great hall, formerly the meeting-place of the Scottish Parliament, rooms for the two various divisions of the civil court and for the Jeals ordinary, a room for the High Court of Justiciary (supreme criminal court), and other accommodations. The extensive libraries belonging respectively to the Advocates (barristers) and Writers to the Signet (solicitors), are adjacent; the former being a collection of about 18,000 volumes. Holyrood-house, the palace of the Scottish kings, is situated at the lower extremity of the principal street of the Old Town. The oldest part is a mass of building erected by James V., containing the presence-chamber, bed-room, and other apartments, used by Queen Mary, with some of the original furniture; as also a gallery, furnished with (generally imaginary) portraits of the kings of Scotland. The apartments of the queen are to be regarded with no ordinary interest, both as furnishing a curious and faithful memorial of the domestic accommodations of a princess of the sixteenth century, and on account of that extraordinary incident, the murder of David Rizzio, which took place within them. Another part of the building, erected in the reign of Charles II., contains the apartments used by George IV. for his levee in 1822, and a suite of rooms which furnished accommodation to Charles X. of France and his family, during the years 1831–2–3. Closely adjoining to the palace, are the ruins of a Gothic church, originally that of the Abbey of Holyrood, and latterly a chapel-royal.

The College is a large modern quadrangular building, in the southern quarter of the city. It contains class-rooms for the professors (33 in number), a library of splendid proportions and decoration, and an extensive museum of natural history. The university is chiefly distinguished as a school of medicine; but it is also the means of preparing a great number of the native youth for the profession of law and divinity. The Register House is a beautiful building, planned by Adam, in a conspicuous part of the New Town: it contains the records connected with the legal business of the country. The Royal Institution is the general appellation of an elegant building facing the centre of Princes street, and containing halls for various public bodies, as the Royal Society of Edinburgh, the Antiquarian Society of Scotland, the Scottish Academy of Painting and Sculpture, and an academy for instruction in drawing. Of places of worship, the most remarkable are St. Giles' Church in the Old Town (once the cathedral), a Gothic building of the fifteenth century, lately renovated; the Trinity College Church, also a Gothic building, founded by the queen of James II. of Scotland; St. George's, St. Stephen's, and St. Andrew's, modern churches of the establishment; and St. Paul's and St. John's elegant Gothic chapels of the Episcopalian body. There are two Roman Catholic chapels, and many dissenting places of worship. Of the other public buildings, the most remarkable are the Infirmary; the hospitals for the maintenance and education of poor children, of which Heriot's is the most elegant; the Surgeons's and Physicians' Halls; and the offices of the Bank of Scotland and Royal Bank. On the Calton Hill are situated some other public structures, as the County Jail and Bridewell, monuments to Nelson, Dugald Stewart, and Professor Playfair, an astronomical observatory, and a small portion of a building designed as a national monument to the Scotsmen who perished in the last war, but which will probably never be completed. The population of Edinburgh in 1831 was 136,301.

Leith, the sea-port of Edinburgh, and recently constituted an independent parliamentary burgh, is situated at the efflux of the rivulet of the same name, which originally constituted its harbour. The older part of the town is crowded and mean, but in the outskirts there are some good streets. The town is connected with Edinburgh by a broad and beautiful road, above a mile in length, denominated Leith Walk. Besides the quays skirting the embouchure of the river, there is a range of wet-docks; but the harbour, after vast efforts to improve it, continues to labour under several strong natural disqualifications. During spring tides, the utmost depth of water on the bar at the mouth of the river is seventeen feet—during neap tides, fourteen feet; and it is rarely that vessel of 400 tons can gain admission. The want of deep water at Leith is partly supplied by a harbour at Newhaven, a stone-pier at Granton, and a chain-pier at Trinity, which serve as places of embarkation and debarkation for steamers and other vessels devoted chiefly to passengers. The chief foreign trade of Leith is with the ports in the Baltic and north of Europe; next to this in importance ranks its intercourse with the West Indies. But the imports of Leith are chiefly for local consumption, and bear little reference to the great manufacturing

business of the country. For the coasting trade there are various companies, each of which has several vessels in employment. Amongst the ports with which regular intercourse is carried on by steam, may be mentioned London, Hull, Newcastle, Aberdeen, and Rotterdam. The tonnage belonging to Leith is on the decline: it was, in 1826, 25,674; in 1832, 23,094; in 1835, 22,073. The amount of tonnage which entered the harbour in 1835 was 340,540. The gross amount of custom-house duties in 1834 was £386,905. In Leith there are several breweries, a sugar-refining establishment, and several manufactories of soap, candles, ropes, and glass. The Custom-house, an elegant modern building, is the seat of the Board of Customs for Scotland. In 1831 the population of Leith was 25,855. The town, in union with Newhaven, Portobello, and Musselburgh, returns a member to Parliament.

Glasgow, the most populous city in Scotland, occupies a highly advantageous situation on the banks of the Clyde, in Lanarkshire, a few miles from the place where the river expands into an estuary, 42 miles from Edinburgh, 397 from London, and 196 from Dublin. The external appearance of this great city is elegant and impressive. The streets are regular in arrangement, and substantially built of smooth stone. The public buildings are in general handsome, and, in most instances, disposed in such a manner as to be seen to advantage. The more ancient part of the city extends along the line of the High street, between the Cathedral and the river; the more modern and elegant part stretches towards the north-west. On the left bank of the river, and connected by three bridges, is situated the populous barony of Gorbals, bearing the same reference to Glasgow which Southwark bears to London. Westward from the lowest of the bridges, both sides of the river are formed into quays, which, owing to recent operations for deepening the channel, are now approached by vessels drawing about fourteen or fifteen feet water. The quay on the right or north bank is denominated the *Broomielaw*: it has recently been extended to 3340 feet in length, while that on the south bank is 1260 feet.

Glasgow took its rise as a dependency of the cathedral of the bishops (latterly archbishops) of the see bearing its name. It was not, however, till long after the Reformation, that it became a seat of considerable population. About the middle of the eighteenth century, it had acquired a considerable share of the import colonial trade, which it still retains; but, during the last seventy years, it has chiefly been distinguished as a seat of manufactures. The weaving of lawns, cambrics, and similar articles, commenced in Glasgow in 1725. The advantages enjoyed by the city for the importation of cotton, in time gave a great impulse to that species of manufacture. In 1834, out of 134 cotton-factories existing in Scotland, 100 belonged to Glasgow, and the importation of cotton into that port amounted to 95,703 bales. In the weaving of this material, upwards of 15,000 power-looms, and 32,000 hand-loom weavers, were at the same time employed by the manufacturers of Glasgow. Of calico-printing establishments there are upwards of forty. It would be vain to attempt an exact enumeration of the less prominent features of the business carried on in Glasgow. The chief articles of importation, besides cotton, are sugar, rum, tea, tobacco, and timber. The chief articles manufactured or prepared, besides cotton goods, are sugar, soap, glass, iron, ropes, leather, chemical stuffs, and machinery. There were recently seven native banks, and several branches of other banks. During a year extending from a certain period in 1839, to a certain period in 1840, 5484 vessels, of 296,302 tonnage, arrived at the Glasgow harbour; the custom-house revenue of 1839 was £468,975, and the harbour dues of the twelvemonth ending August 31 of that year were £45,826. It is worthy of remark, that the Clyde was the first river in the elder hemisphere on which steam navigation was exemplified. A steam-vessel of three horse power was set afloat on the river in January, 1812, by Mr. Henry Bell of Helensburgh; and there were twenty such vessels on the Clyde before one had disturbed the waters of the Thames. In 1835 there were sixty-seven steam-vessels, of 6691 aggregate tonnage, connected with Glasgow, eighteen of which plied to Liverpool, Belfast, Dublin, and Londonderry. Within the last few years, the city has become a great centre of the iron trade, this metal being produced in the neighbourhood to an annual amount of not less than 200,000 tons. As a necessary consequence of the commerce and manufactures which flourish in Glasgow, the city has a vast retail trade in all the articles of luxury and necessity which are used by human beings. But no circumstance connected with Glasgow could give so impressive an idea of the height to which business has been carried in it, as the rapid advance and present great amount of its population. By the census of 1791, the inhabitants were 66,578; and by the first government census in 1801, they were 77,385. But these numbers have been increased in 1811, 1821, and 1831, respectively, to 110,749, 147,043, and 202,426. As the increase is about 7000 per annum, the present amount (1841) is supposed to be fully 285,000—a mass of population which, at the time of the Union, could not have been dreamt of as likely ever to exist in any Scottish city.

The Cathedral, or High Church, is situated in the northern outskirts of the city, near the upper extremity of the High street. The bulk of the existing building was constructed at the close of the twelfth century, in place of another which had been consecrated in 1136, but was destroyed by fire. It consists of a long nave and choir, a chapter-house projecting from the north-east angle, a tower and spire in the centre, and a crypt extending beneath the choir or eastern portion of the building. In the nave, termed the Outer High Kirk, was held the celebrated General Assembly of the Church, November, 1638, by which Episcopacy was abolished and pure Presbytery replaced—the first great movement in the civil war.

The elevated ground, near the east end of the Cathedral, has been formed into an ornamental place of sepulture, under the appellation of the Necropolis. Since 1831, the Society of Merchants, its proprietors, have expended the sum of £6000 in laying out about twenty-four acres of ground in walks and shrubberies, and in connecting the spot with the opposite slope by means of a bridge across the intermediate rivulet. The taste manifested in the whole scheme and in its execution, is extremely creditable to the city. The walks, several miles in extent, command an extensive view of the neighbouring country. They are skirted by numberless sepulchral plots and excavations, where already affection has been busy in erecting its "frail memorials," all of which, it may be mentioned, are fashioned according to certain regulations, with a view to general keeping and effect.

The College buildings are situated on the east side of the High street, about half-way between the Cathedral and the Trongate. They consist in a sort of double court; the front which adjoins to the street being 300 feet in length, and three stories in height. The whole edifice has a dignified and venerable appearance. A large piece of ground behind the College is formed into a park or green, interspersed with trees and hedges, and always kept in grass, to be used by the students as a place of exercise or amusement. In the College there are appointed professors or teachers of about thirty branches of science, theology, and polite literature. At the back of the interior court stands the modern Gothic building which contains the Hunterian Museum. This is a large collection of singular natural objects, coins, medals, rare manuscripts, paintings, and relics of antiquity, originally formed by Dr. William Hunter, the cele-

brated anatomist, and bequeathed by him to this university, at which he received his education. While the College confers professional education, popular instruction is attainable, under unusually advantageous circumstances, through the medium of the Andersonian Institution, an extensive school of science founded at the close of the last century, and connected with which there is a general museum, containing many curious objects, and constantly open to the public.

The most attractive modern building in Glasgow is the Royal Exchange in Queen street, a most superb structure, erected in 1829, as a point of assemblage for the merchants in the western part of the city. The principal room is a large hall, supported by a double row of columns, and used as a reading-room. The front of the Exchange consists of a magnificent portico, surmounted by a cupola; and, as the building is isolated, the other sides are also of decorative architecture. Altogether, this building, supported by a set of very elegant domestic structures of similarly august proportions, impresses the mind of a stranger as something signally worthy of a great city.

Since the Reform Act of 1832, Glasgow has the privilege of returning two members to Parliament. The places of worship, charitable institutions, and associations of various kinds for public objects, are very numerous. A laudable zeal for the improvement of education marks the city; and a normal school, or seminary for the rearing of teachers—the first in the empire—has been erected under the auspices of a private society.

The means of communication in connection with Glasgow, are suitable to the character of the city as one of the greatest emporia of commerce and manufacture in the world. Besides a river, navigable by vessels drawing fifteen feet of water, and which gives the means of a ready communication with the western shores of Britain, with Ireland, and with America, the Forth and Clyde Canal, of which a branch comes to Port-Dundas, in the northern suburbs, serves to convey goods and passengers to the eastern shores of the island, while canals of less note connect the city with Paisley and Johnstone in one direction, and with the great coal-fields of Monkland in the other. There is also a railway, which traverses the same great coal-field, by Garnkirk and Wishaw, and conveys passengers as well as coal and goods. Another railway, connecting the city with Kilmarnock, Ayr, and the port of Ardrossan, was opened in 1840. During the year in which this sheet makes its appearance, a third railway, passing by Falkirk and Linlithgow to Edinburgh, will be opened. Others are projected. The steam communication between Glasgow and Liverpool, Dublin, and other Irish ports, is conducted on a scale which may be called grand. The vessels are superb in magnitude, decoration, and power; and they sail frequently and rapidly. The steam intercourse between Glasgow and various places in Scotland, both for passengers and objects of traffic, is also conducted on a great scale: among the places touched at in the Clyde and to the south are Greenock, Dunbarton, Dunoon, Rothesay, Arran, Gourock, Troon, and Ayr. Among the places to the north, to which vessels sail regularly, are Inverary, Campbelton, Oban, Staffa, and Iona, Mull, Arisaig, Skye, Stornoway, and Inverness. In opening up markets for West Highland produce, and introducing luxuries in return, these vessels have also been of marked service, insomuch that the value of property in those hitherto secluded districts has experienced a considerable rise.

The country around Glasgow, particularly towards the south, abounds in busy towns and villages, of the former of which the most remarkable is *Paisley*, situated in Renfrewshire, on the banks of the small river Cart, seven miles from the city above described. The external appearance of this town is pleasing, and the streets are in general composed of substantial buildings. It originated from an abbey founded in 1160 by Walter, the first of the Stewarts, and of which considerable remains still exist. Paisley is a noted seat of the manufacture of shawls, and also of cotton thread, gauzes, and velvets. In the town and Abbey parish, exclusive of the large village of Johnstone, there were lately three cotton spinning-mills, and seven or eight thread-mills: two steam-loom factories, six flour-mills; a calico-printing work; many bleaching works and dye-houses; three breweries and two distilleries; several timber yards; and several iron and brass founderies; an alum and copperas work, a soap work and a tan-yard. An idea of the present extent of manufactures, in comparison with what it was in the last age, may be obtained from the fact, that, while the whole of the manufactures in 1760 amounted to £15,000, the annual computed value of the goods made in and around the town a few years ago, was a million and a half sterling.

Paisley has been changed by the Reform Acts from a burgh of barony into a parliamentary burgh of the first class, returning one member, divided into wards for municipal purposes, and managed by sixteen councillors, including a provost, four baillies, and a treasurer. Being, though not the county town, the seat of the sheriff court, it is adorned by a large modern castellated building, containing a jail, bridewell, and series of court-rooms; but unfortunately the edifice is placed in a low situation, without reference to salubrity or external influences. Devoted as the inhabitants of Paisley are to the pursuits of business, they have long been honourably remarkable for a spirit of inquiry and a desire for intellectual improvement. The population of Paisley, like that of Glasgow, has experienced a very rapid advance; the inhabitants of the town and surrounding parochial district, in 1821, amounted to 47,003; in 1831, to 57,466.

Notwithstanding the inland situation of Paisley, its means of communication are unusually facile and ample. The White Cart, navigable from its efflux into the Clyde to the Sneddon in the outskirts of Paisley, presents all the advantages of a canal. A canal leaves the suburbs of Glasgow, and, passing Paisley, terminates at Johnstone. Paisley is also benefited by the Glasgow and Ayr Railway, which passes it.

In Renfrewshire, also, is situated *Greenock*, the greatest sea-port of the kingdom, as far as custom-house receipts form a criterion, these having been, in 1834, £482,138 in gross amount. This town occupies a strip of sloping ground facing towards the Firth of Clyde, at the distance of twenty-four miles from Glasgow. In the seventeenth century it was a mere hamlet; now it is a handsome town of about 30,000 inhabitants, containing harbours and quays of 2200 feet in extent, to which belonged, in 1828, 219 vessels, of 31,929 aggregate tonnage, and employing 2210 men. It is now, moreover, by virtue of the recent Reform Acts, a parliamentary burgh of the first class, returning one member of Parliament. The principal branches of commerce conducted in Greenock have reference to the East and West Indies, the United States, and British America, to which last it yearly sends out great numbers of emigrants. Sugar-baking and ship-building are other branches of industry carried on here to a great extent. The Custom-house, fronting to the Firth of Clyde, is a beautiful Grecian building, erected in 1818, at an expense of £30,000. The Tontine Hotel, situated in one of the principal streets, and containing a large public room, twelve sitting-rooms, and thirty bed-rooms, was built, in 1801, by 400 subscribers of £25 each, the whole expense being thus £10,000. There is also an elegant building, in the character of an exchange, which cost £7000, and contains, besides two spacious assembly rooms, a reading room, to which strangers are admitted gratuitously for six weeks. In Greenock there are two native banks, besides branches of several others.

James Watt, the improver of the steam-engine, was born in Greenock in 1736; and an institution for literary and scientific purposes, designed to serve as a monument to him, and termed the Watt Institution, has been recently completed. The situation of the town, on the shore of a land-locked basin of the Firth of Clyde, with the mountains of Argyllshire and Dumbartonshire rising on the opposite side, is very fine.

Among Scottish towns, *Aberdeen* ranks next to Edinburgh and Glasgow. It is situated in the county named from it, on a level piece of ground between the efflux of the rivers Dee and Don, 110 miles from Edinburgh. Its external appearance produces a favourable impression; the principal streets are straight and regular, and the buildings at once substantial and elegant, the chief material used in constructing them being a gray granite found here in great abundance. New Aberdeen, or what is now generally called Aberdeen, is close to the efflux of the Dee, the mouth of which forms its harbour; and Old Aberdeen, where the ancient Cathedral and King's College are situated, is a comparatively small town, about a mile distant, on the bank of the Don. The entire population is about 60,000.

Aberdeen is a city of great antiquity. It became the seat of a university by the erection of King's College, in Old Aberdeen, in 1495; Mareschal College, in New Aberdeen, was added in 1593. By the recent Reform Acts, it is a royal burgh of the first class, divided into districts for municipal purposes, and returning one member to Parliament. Aberdeen is at once a seat of manufactures and a sea-port. There are four great houses engaged in the cotton manufacture, two in the woollen trade, and three in flax-spinning and the weaving of linen. Ship-building, iron-founding, comb-making, rope-making, and paper-making, are also carried on to a great extent. The fisheries of the river Dee, and the export of granite, are sources of considerable income. Of the exports for the year 1836, we may notice, as indicating at once the extent and nature of the agricultural and manufacturing products of the district, the following items:—Flax manufactures, 30,482 barrel bulk; cotton manufactures, 16,336 do.; woollen manufactures, 20,043 do.; oats, 29,239 quarters; meal 13,375 bolls; sheep and lambs, 1407; pigs, 3034; butter, 9261 cwts.; eggs, 9120 barrel bulk; pork, 6006 cwts.; salmon, 7757 do.; granite stones, 1738 tons. The chief imports are, coal, of which there was unloaded, during the same year, 371,914 bolls; lime, cotton, flax, wool, wood, wheat, flour, salt, iron, whale-blubber, and miscellaneous goods, consisting of groceries, &c. There were, in 1836, belonging to the port of Aberdeen, 360 vessels, tonnage 42,080, employing 3110 men.

Aberdeen is entered from the south by Union street, an elegant double line of buildings, a mile in length and seventy feet wide, in the centre of which a ravine pervaded by a rivulet is crossed by a noble arch of one hundred and thirty-two feet in span, upon a rise of twenty-two. King street, which opens up the city from the north, is sixty feet wide, and contains many splendid edifices. Besides these two main streets, there is a considerable number of modern squares and terraces. The public buildings are much scattered, but are generally of an elegant appearance. The Public Rooms, erected by the gentlemen of the counties of Banff, Aberdeen, Kincardine, and Forfar, for meetings, dancing assemblies, &c., and partly occupied as a reading-room, constitute a handsome Grecian structure, fronting to Union street. On the north side of Castle street, stands the Town-House, and in the centre is the Cross, a curious structure re-erected in 1822, and containing sculptures of eight Scottish sovereigns between James I. and James VII. Mareschal College, formerly a plain old structure, has lately been re-edified in handsome style, chiefly at the expense of the nation. King's College consists of a handsome but ill-assorted quadrangle, surmounted by a fine tower and spire. The two colleges are attended by about five hundred students, nearly equally divided between them. In Old Aberdeen are also to be seen the remains of the Cathedral, consisting of the nave of the original building, with two towers at the west end. The ceiling is composed of oak, cut out into forty-eight compartments, each displaying in strong colours the armorial bearings of some eminent person, whose name is given below, in Latin, and in the old Gothic character.

Dundee, situated in Forfarshire, on the shore of the Firth of Tay, may be considered as the fourth town in Scotland, whether in population, or in the importance conferred by wealth. It is a busy sea-port, and the chief seat of the linen manufacture in Scotland, and, indeed, in Great Britain. A series of docks, the erection of which cost £365,000, extend along the shore, where, a century ago, there was only a small quay in the form of a crooked wall. The dues collected for the harbour were, in 1839, £16,996; the tonnage belonging to it, in 1839, was 44,882. In the year ending May 31, 1836, the quantity of hemp and flax imported was 32,462 tons, and the number of pieces of sheeting, bagging, sailcloth, sacking, and dowlas exported, was 717,070, the value of which was about £1,500,000, being considerably greater than the entire exports from Ireland. In 1839, the number of spinning-mills was 41, and of flax-mills (that is, mills for weaving), 47; besides which there are several machine-factories, candle-factories, sugar-refineries, and establishments for rope-making and ship-building. This great hive of industry contained, in 1831, a population of 45,355, to which it is probable that 15,000 have since been added. The town is represented in Parliament by one member.

Dundee contains one handsome *place*, denominated the High Street, in the centre of the town, and several other good streets; but the most elegant and commodious private dwellings take the form of suburban villas. There is a handsome modern building, serving the purposes of an exchange and reading-room, besides which the most conspicuous public buildings are the Town-House and a building comprehensively called the Seminaries, containing an academy and grammar-school. The High Church of Dundee was an interesting building of the thirteenth century, with a massive tower 156 feet high; but the whole structure, excepting the steeple, was destroyed by fire in January, 1841. Dundee is connected by railways with Arbroath and Brechin on the one hand, and Newtyle on the other. It carries on a regular steam intercourse with London.

Perth, the chief town of the county of the same name, is celebrated on account of its elegant appearance and the beautiful situation which it enjoys on the banks of the Tay, here a broad and majestic stream. Umbrella cloths, ginghams, handkerchiefs, and shawls, are manufactured in Perth in considerable quantities, the number of weavers employed being 1600; and there are a flax spinning-mill and an extensive bleachfield. The river being navigable to this place for small vessels, there is a harbour, chiefly for coasting trade. The salmon fishery on the river are a source of considerable income: the fish are sent to London, in boxes, the number of which, in 1835, was 5000, amounting to 250 tons. Perth had, in 1831, a population of 20,010, and it is represented by one member in Parliament.

The streets of Perth are generally rectangular, and well built of stone. The river is spanned by a substantial bridge, connecting the town with a small suburb on the other side, and forming part of the great north road. The town contains most of the public buildings found in places of similar character and magnitude: the new Church of St. John, an elegant suite of county buildings, an academy, and town-hall, are those most entitled to notice within the town. In the environs, besides a

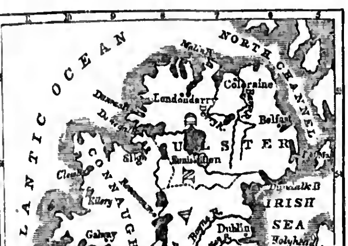
asylum, there is a structure designed, when finished, to serve as a national reformatory for criminals. The beauty and salubrity of Perth are much enhanced by two beautiful pieces of adjacent public ground, respectively entitled the North Inch and South Inch. In the midst of a highly cultivated vale, pervaded by a great river, and with lofty mountains in the distance, Perth, especially when its own neat appearance is considered, may be said eminently to deserve its appellation of "the fair city."

Dumfries, the principal town of Dumfriesshire (71 miles from Edinburgh and 34 from Carlisle), enjoys a beautiful situation on the Nith, which is navigable to nearly this point for small vessels. Inclusive of a large suburb on the opposite side of the river, the population is about 14,000. Dumfries has a few small manufactures, but its chief importance rests in its character as a kind of provincial capital and seat of the county courts, and as an entrepôt for the transmission of cattle and pork to the English market. Eighty-four vessels belong to the port, with an aggregate tonnage of 5783; and steam-vessels sail regularly to Liverpool. The town has a neat and clean appearance, has some handsome public buildings, and is the seat of considerable refinement. In St. Michael's Churchyard repose the remains of Robert Burns, over which his admirers have reared a handsome mausoleum.

Inverness (155 miles from Edinburgh) is the principal seat of population in the northern counties of Scotland. It is an ancient royal burgh, a seaport for the export and import trade of the district, and the seat of the county courts. The situation on the river Ness, near its junction with the sea, with some picturesque eminences in the neighbourhood, is one of great beauty, and the town itself is well built and remarkably clean. Inverness is often called the Highland capital, being within the line of the Grampians, and the residence of many persons connected with that district. The population of the town and parish, in 1831, was 14,324. Among objects of interest may be enumerated—the remains of a fort built by Cromwell; Craig-Phadric, an eminence crowned by a vitrified fort; and the moor of Culloden (distant five miles), the scene of the fatal battle which extinguished the hopes of the house of Stuart.

The principal towns in Scotland, next to those above enumerated, are—in Ayrshire, *Kilmarnock*, a prosperous seat of the coarser woollen manufacture—population about 20,000; *Ayr*, the capital of the county, a thriving market-town, and in a small degree a sea-port—population (including dependencies) about 17,000; in Stirlingshire, *Stirling*, the county town, remarkable chiefly for its castle, a favourite seat of the Scottish monarchs, and from which the most splendid views are commanded; *Falkirk*, a busy market-town, and the centre of a district remarkable for its iron founderies, particularly the celebrated one of Carron—population about 7000; in Fifeshire, *Dunfermline*, the principal seat of the manufacture of damasks, diapers, and similar fabrics—population about 18,000, *Cupar*, the county town; *Kircaldy*, a busy manufacturing and sea-port town; *St. Andrews*, the seat of an ancient university; in Forfarshire, *Montrose* and *Arbroath*, active seats of the linen trade, and likewise seaports; in Morayshire, *Elgin*, an ancient royal burgh and county town.

DESCRIPTION OF IRELAND.



This large and important section of the United Kingdom is geographically described as an island situated to the west of Great Britain, from which it is divided by a strait, called at different places St. George's Channel, the Irish Sea, and North Channel, the Atlantic forming the boundary on the other sides. Of a more compact form than Great Britain, it is nevertheless penetrated by a considerable number of deep bays and estuaries, which give it an outline upon the whole irregular. Besides enjoying this advantage for internal navigation, it may be considered as more favourably situated for foreign commerce than either England or Scotland. It lies between 51° 19′ and 55° 23′ north latitude, and 5° 19′ and 10° 28′ of west longitude from Greenwich; but the greatest length, from Brow Head in the county of Cork, to Fair Head in the county of Antrim, is 306 miles, and the longest transverse line, between similar points in the counties of Mayo and Down, 182 miles. The entire area appears, from the latest and best measurement, to include 31,874 square miles, or 20,399,608 English statute acres.

Ireland is divided into four provinces, namely Leinster, on the east; Munster, on the south; Ulster, on the north; and Connaught, on the west: these are subdivided into 32 counties, 252 baronies, and 2348 parishes. For an account of the ecclesiastical divisions and civil polity, we refer to the Constitution and Resources of the British Empire.

In superficial character, Ireland may be called a hilly or mountainous country, since there are few spots where the view is not terminated by lofty hills or mountain scenery. Generally speaking, the mountains stand in groups, and are more or less detached from each other, but in some districts they form ridges of great extent. The Mourne range, in the county of Down, lies west and east, ending with *Sliere Donard*, which rises 2809

feet above the level of the sea, and is the highest of the northern mountains. The *Slieve Bloom* mountains, placed in nearly the centre of the island, run north and south, intersecting the King and Queen's Counties: in this range, sometimes called the *Ard na Erin*, or Heights of Ireland, the rivers Nore, Barrow, and Suir, commonly called by the country people the Three Sisters, take their rise. In Connaught there is a fine range, of which the *Twelve Pins* form a part; and in Munster, a ridge of varied height extends from Dungarvon, in the county of Waterford, across the kingdom, into the county of Kerry. It may be here observed, that wherever the Irish term *slieve* is applied to a mountain, it expresses that that mountain forms part of a range. The highest mountain in Ireland is *Carran Tual*, at Killarney, being 3410 feet above the level of the sea. *Mount Nephin* and *Croagh Patrick*, two conspicuous mountains in Mayo, are respectively 2639 and 2499 feet high. Some, however, of the counties, though possessing a very varied surface, can only boast of hills, as Armagh, Monaghan, Cavan, and Louth, while others are in general very level: Meath, Kildare, Longford, and Galway, are of the latter character. A distinguishing peculiarity of the country, whether in its hilly or more level districts, is its generally green appearance, a circumstance arising from its fertile soil and moist and temperate climate, and which has led to its receiving the appellations of the "Emerald Isle" and "Green Isle of the Ocean"—names sung by its poets, and repeated with affection by its natives in all quarters of the world.

In the lower and less reclaimed portions of the country, there are various extensive bogs or morasses, which disfigure the beauty of the scenery, and are only serviceable in supplying fuel to the adjacent inhabitants. The chief of these morasses is the Bog of Allen, which stretches in a vast plain, across the centre of the island, or over a large portion of Kildare, Carlow, and the King and Queen's Counties. In this bog, the beautiful River Boyne takes its rise, flowing thence north-eastward to the sea at Drogheda, on the borders of the county of Louth: much of this bog has been drained and brought into tillage, and there is good reason to think that in time the whole of it will be reclaimed. Along the banks of the River Inny, which is rising in Lough Iron, in the county of Westmeath, crosses Longford and falls into the Shannon, are large tracts of deep wet bog, only exceeded in dreariness by that which for miles skirts the Shannon, in its course through Longford, Roscommon, and the King's County. All these bogs might be easily reclaimed, could they be drained; but that cannot be accomplished, as the Inny and the Shannon are kept up to their present level by the numerous eel-weirs which at present interrupt their course. There are also many tracts of bog in the western counties, and many detached bogs both in Ulster and Munster; but none of such great size as those above mentioned. It is remarkable, that notwithstanding the quantity of water contained in these extensive bogs, there arises from them no miasma injurious to health. This is attributable to the large portion of tannin they contain, which possesses so strong an antiseptic quality, that bodies plunged into a deep bog remain undecayed, the flesh becoming like that of an Egyptian mummy. It sometimes happens that a bog, overcharged with water during a rainy season, breaks through the obstruction which the drained and more solid part affords, and, rushing forward, overflows large portions of good land. This occurred in the year 1821, when the Bog of Clara, in the county of Westmeath, suddenly burst into the valley of the River Brusna, and totally destroyed many hundred acres of excellent land: a similar occurrence took place, to a large extent, a very few years since, in the county of Antrim.

Ireland is described as a thickly-wooded country, not only by her early native writers, but by all those English authors who have given any account of the country from the days of Giraldus Cambrensis, about A. D. 1185. Morrison (1596) and Davis (1605) mention the forests in which the poor Irish took refuge; and all the scenery of Spenser's *Fairy Queen* is drawn from the River Bandon, which he celebrates as the "pleasant Bandon, wood y-crowned," as it is to this day. Boate, in his Natural History, mentions the great extent of wood then standing; but not long did it so stand, for wherever Cromwell's army came, the forests were felled, and the country laid bare. In most cases, the bogs give ample testimony to the truth of these statements, some supplying large quantities of *fir*, which burns with a pleasant aromatic smell, and a flame so brilliant that it is often used in the place of candles. In other bogs, only oak is dug up, and sometimes sallow, and yew of a great size, which takes a fine polish and is used for cabinet-work. There are still, in a few favoured spots, some remains of the ancient oak and ash woods, as at Killarney, at Glengariffe near Bantry, in Connemara, in some spots of the county of Wicklow, and in Donegal, near the beautiful but little Lough Van, where a few red deer are still to be seen. Near the mouth of the Suir, at the foot of the Knockmeledan Mountains, is a wood of the pine species, commonly called Scotch fir, of such size and hardness, that Mr. Nimmo, the engineer, pronounced it to be equal to the best Memel timber, and used it in constructing the pier at Dunmore. Many noblemen and gentlemen have planted largely and with great success, their flourishing plantations giving promise that the country in a few years will again be furnished with trees.

Ireland possesses many large and remarkably fine rivers, several of which form lakes at certain points in their course, and fall into the sea at the head of spacious bays every way suitable for navigation. The principal rivers are the *Foyle* and the *Bann*, which flow into the Northern Ocean: the *Boyne*, the *Liffey*, and the *Slaney*, which empties themselves into the Irish Channel; the *Barrow* and the *Nore*, which, falling into the *Suir*, pour their united streams into the Bay of Waterford; the *Blackwater* and the *Lee*, which run southward, their embouchures being at Youghal and Cork; the *Shannon*, the *Gweebarra*, the *Erne*, the *May*, the *Mang*, and the *Lane*, which flow into the Atlantic. Among inland lakes or loughs, the largest is *Lough Neagh* in Ulster, which exceeds in size any lake in the United Kingdom, its length being twenty miles by a breadth of from ten to twelve: its waters are discharged by the Bann.

GEOLOGICAL STRUCTURE.—MINERALOGY.

Ireland stretches westward into the Atlantic, and is indented, as has been stated, by deep bays, protected by jutting promontories, which have hitherto withstood the force of the boisterous ocean to which they are exposed. The rock which forms the bed or bottom of these bays is generally composed of the secondary or carboniferous limestone, while the projecting promontories to the north and south of each, are composed, for the most part, of primary or transition rocks, and particularly of greenstone, mica-slate, quartz rock, grawacke, and old red sandstone conglomerate. In Ireland, the coast is mostly mountainous, and the interior flat. Thus, we find the mountains of Antrim on the east; of Derry and Donegal on the north-west coasts; those of Sligo and Kerry west and south-west. The slate districts of Cork and Waterford form the south and south-east, while the mountains of Wicklow, and those still higher ones of Louth and Down, are situated on the eastern coast. The interior of the island is, generally speaking, composed of flat or gently-swelling grounds, covered with rich and fruitful soil. This peculiar conformation of the surface has been the origin of the great number of rivers with which the Irish coast abounds. They have their sources in the neighbouring mountains, whence they flow directly to

the sea. The flatness of the interior of Ireland has been the probable cause of those vast accumulations of alluvial matter called *escars*. They possibly originated at a period when the country was at least partially submerged, from eddies formed by undulations on the surface. The origin of the great tracts of bog for[illegible] generally in the flat country, may be attributed to the water pent up, as we even now find it, above the level of the dry country, by gravel hills, which form a continuous ridge, though not of equal height, round the edge of the bog. The central district of Ireland contains upwards of one million of acres of bog, comprehended between Wicklow Head and Galway, Houth Head and Sligo.

A vast tract of limestone extends in an almost unbroken line from the north of Cork to the south of Fermanagh, with an intermixture towards the eastern coast of clayslate, grawacke, and grawacke-slate, with veins of granite interspersed, as is the case in the counties of Down, Armagh, and Wicklow. The southern coast is composed of limestone and old conglomerate, with red, purple, and gray clayslate, which may be distinctly seen along the shores of Cork and Waterford. In the south-western coasts are large tracts of coal formation; while the western are formed of granite, carboniferous limestone, including the lower limestone, calp or black shale series, and the upper limestone, with a tract of the coal formation. There are also in Galway, Mayo, and Sligo, tracts of mica-slate, quartz rock, yellow sandstone, and conglomerate. The northern division, consisting of the counties of Donegal and Derry, is chiefly mica-slate, with an intermixture, in the northern part of Donegal, of granite, quartz rock, and primary limestone; while the county of Antrim is composed of tubular trap. The counties in which coal is worked are Carlow, Kilkenny, Donegal, Limerick, Tyrone, and part of Tipperary. Ireland is rich in minerals, and contains gold and silver, though not in large veins, as well as copper, lead, coal, and sulphur. Her quarries also produce a variety of beautiful marbles, as the black marble of Kilkenny, the green of Galway, and the many-coloured of Fermanagh. The quarries of Killaloe and of Valentia, in the county of Kerry, afford large-sized excellent slates, now coming extensively into use. Nor should the inexhaustible supply of extremely fine building-stone which the hills south of Dublin afford, be left unmentioned. Of this granite, the particular vein which is worked at the coast village of Bullock, has been found to withstand the wash of the sea better than any other kind of stone, and is exclusively reserved for the building of the lower stories of those lighthouses which are exposed to violent sea-wash. The stones are cut on the spot, and shipped ready fitted to their places.

CLIMATE.

There is but a small part of Ireland more than fifty miles from the sea, a circumstance which fully accounts for the mildness of the climate, its equability, and its humidity. The temperate atmosphere of Ireland was held in high estimation, and strong testimony to its goodness is borne by the older historians. At the beginning of this century (1804), Dr. Hamilton, in his account of Antrim, mentions the equable distribution of heat throughout the island, and the perpetual verdure of the fields, unimpaired by either solstice. This equability of temperature is clearly proved by the fact, that delicate plants thrive in the county of Donegal, close upon the Northern Ocean. Arbutus and laurestinus there grow healthily, and myrtles so luxuriantly, as to cover the walls of houses up to the second story. On the shore of Lough Swilley, near Ramelton, the agapanthus and the fuchsia abide in winter in the open ground; and flower extremely well in summer.

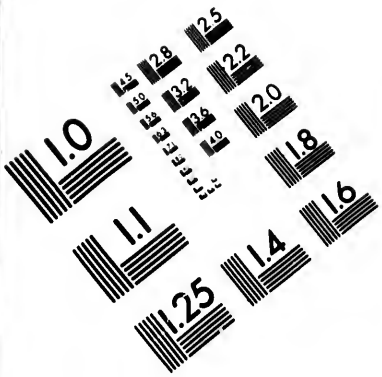
The southern part of Ireland is considerably warmer than Ulster. The snow seldom lies for any considerable time. The spring is earlier, fruit ripens a fortnight sooner, and the harvest is fit for the sickle a month before that of the northern, and about a fortnight before that of the midland districts. In the counties of Cork and Kerry, tender shrubs, such as bay, verbena, fuchsia, &c., grow with extraordinary luxuriance; and the native arbutus enriches the wild scenery of Killarney and Glengariffe. The moisture of the climate is its greatest defect; but this varies remarkably in degree. The atmosphere of the western side of Ireland is naturally much more humid than that of the eastern, exposed as it is to the influence of the moist vapours of the great Atlantic, which, attracted by the mountains, rest upon their heads and pour down rain into the valleys. Thus, the greatest quantity of rain which has been known to fall—forty-two inches—was near Colooney in the county of Sligo, while the smallest quantity is at Armagh, which, though a very hilly, is comparatively an inland district. In a paper lately read at the Royal Irish Academy, it appeared, f[illegible]mparative registers carefully kept, that, in the yea[illegible] th[illegible]had been, at Monks Eleigh, which is about forty [illegible] the sea-coast of Suffolk, 21.796 inches of rai[illegible]n Tuomavara, in the county of Tipperary [illegible] forty miles from the western coast, there fell [illegible] or very nearly double the quantity ; but duri[illegible] year, only 21.7 fell at Armagh —a curious in[illegible]he differences arising from local circumstances. Again, the county of Dublin is wetter than that of Wicklow, because the clouds charged with rain pass over Dublin towards the channel, free from every obstacle, while those which cross Wicklow, striking upon the mountains and hills, deposit their moisture upon their western slopes, leaving the eastern sides of the country between them and the sea dry and in sunshine.

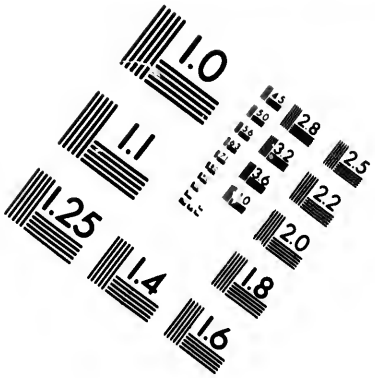
VEGETABLE PRODUCTIONS.—ANIMALS.

The botany and zoology of Ireland generally resemble those of the neighbouring island. The cultivated plants and useful animals are identical. There are, however, some peculiar to Ireland.

The more remarkable plants which are indigenous and peculiar to Ireland, are—the *arbutus unedo*, or strawberry-tree, found at Killarney, particularly beautiful from its abundance of red fruit; the *rosa Hibernica*, Irish rose, found near Belfast; the *ulex strieta*, Irish furze, found sparingly in the county of Down, distinguished from common furze by its upright mode of growth and softer texture; the *taxus Hibernica*, frequently called Florencecourt yew, from having been first observed in Lord Enniskillen's demesne in the county of Fermanagh —its growth is upright, resembling that of the cypress, and its foliage dark green; the *menziesia polyfolia*, Irish menziesia, a very beautiful plant, whose large purple heath-like bells decorate the wild districts of Galway; the *erica Mediterranea*, discovered by Mr. Mackay at Connemara in 1829, a distinct variety of the Corsican heath, very ornamental in the flowering season; the *erica Mackayana*, many-branched, cross-leaved heath, sent to Mr. Mackay from Connemara, and named after him by Sir William Hooker, Professor of Botany, Glasgow (the three last species of heaths are also natives of the Pyrenees); the *saxifraga geum*, kidney-leaved saxifrage; *s. hirsuta*, hairy saxifrage; *s. elegans*, small round-leaved saxifrage; *s. umbrosa*, variety serratula, saw-leaved saxifrage, or London pride. The above four species and varieties, new to Britain and Ireland, were discovered by Mr. Mackay, in the mountains near Killarney, in 1805. They all resemble the London pride of the gardens, which also grows wild on the mountains of Galway, Mayo, Sligo, and Donegal.*

* For the above account of Irish plants, the writer is indebted to Mr. Mackay, Curator of Trinity College Botanic Gardens, and author of the *Flora Hibernica*.





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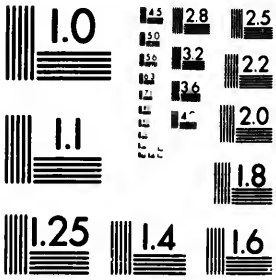

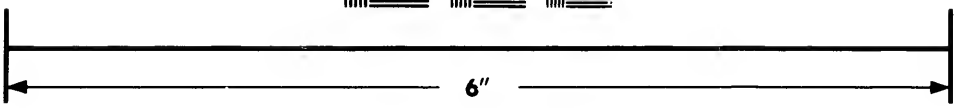

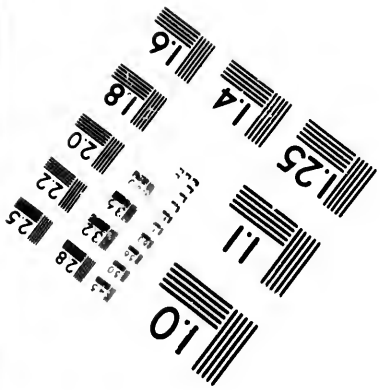

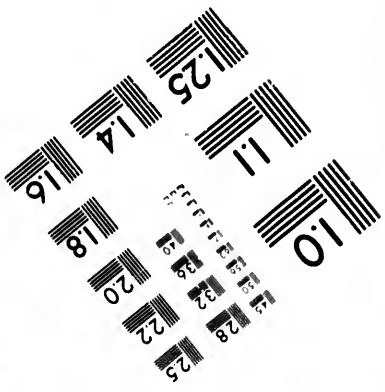

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With respect to the animal kingdom, there were formerly several races of cattle considered as exclusively Irish, of which two kinds are still extant—the *Kerry breed*, which is black, very small, and beautifully proportioned, the limbs and horns being most delicately made; they are excellent milkers, both for quantity and quality, and are remarkable for their gentle and affectionate disposition: they are to be had only in the remote barony of Iveragh, in the county of Kerry. The other species, which is always called the *old Irish breed*, is usually of a bright red, the back hollow, the *pin* bones high, the head very small, a fine eye; the horns growing upright, and remarkably slender, as are the legs. They are very deficient in beauty, but are valuable for the dairy. The *red deer*, though now extremely scarce, are still to be found at Killarney, in some of the wild mountain districts of Kerry, and the adjoining part of the county of Cork; at Shanbally in the county of Tipperary, and in Donegal. The *wolf-dog*, now almost extinct, is still occasionally to be seen in Ireland; the *curly-haired, liver-coloured water-dog*, which is considered quite an Irish breed; the large *black and tan* breed of terriers, peculiar to the county of Kerry. Squirrels are common in some places. The *gillaroo-trout* is peculiar to Lough Neagh; and the *pollen*, or fresh-water trout, was long considered so, but has lately been found in the Scottish lakes. The *dorchar* is also peculiar to Lough Neagh; it is of a darker colour than trouts usually are. It is generally supposed that Ireland possesses no reptiles, but this is a vulgar error. The toad and frog are common.

THE PEOPLE—THEIR CHARACTER AND CIRCUMSTANCES.

The bulk of the Irish people are a branch of the Celtic race, who were probably the first settlers in the island. The peasantry, throughout nearly the whole country, are of this origin, and in many parts they still speak the Celtic (here termed the Irish) language. The chief exception from this rule is in the north, where a great number of the humbler, as well as middle classes, are descended from comparatively recent settlers of Scottish extraction. Another rather conspicuous exception is found in Connaught, particularly in Galway, where a considerable number of the people seem to be of Spanish descent. Families of English extraction are comparatively rare among the labouring class in Ireland.

The Irish labouring classes, and a large portion of the middle classes, being thus generally of Celtic origin, are marked by many peculiar features. Their character includes much quickness of apprehension and ingenuity, considerable natural eloquence and wit, and affections much warmer than those of most European nations, but is generally acknowledged to be deficient in reflection and foresight, and liable to a peculiar irascibility, which often attaches to a mercurial and upon the whole amiable character. The upper, and a large portion of the middle classes, being of Saxon descent, are not much different from the same classes in Great Britain; but, in as far as any difference exists, it may be said to consist in a tincture of the Celtic, or genuine Irish character, as just described. This admixture is perhaps that which gives the educated Irish so much artistic talent, whether to be exhibited in literature or the arts, while some of the more peculiarly English characteristics are less conspicuous.

Limiting the consideration of the social state of Ireland to what is peculiar to it, we may first advert to a conspicuous practice of the landowners—*absenteeism*. By absentees are not meant those noblemen, who, being Englishmen, have also large possessions in this country, and whose estates (with some glaring exceptions) are usually well and justly managed; but those sons of Erin who prefer living in any other country to remaining in their own, although it is at home only that a man receives his just meed of respect. This system of absenteeism has led to that of *middlemen*, who hold large tracts of land from the head landlord, and relet this land at a much increased rent to farmers; these, again, let to a third set of under-tenants at rack-rents; and this lowest grade of tenantry divide their small farms among their sons, thus creating a race of farming poor, who are unable to till their holdings properly, and miserably increasing a population raised but a step above the pauper. There is perhaps no more thriving person than the *farming landholder*, who, contented with his condition, rises with his labourers, holds his own plough, and superintends the management of his farm; but the state of the *cottier* is often far from being a happy one. The discomfort of this class may be said to arise chiefly from three causes—low wages, high rents, and, most of all, from the want of steady employment. The too great subdivision of land, as will be shown, in treating of the condition of the peasantry in the provinces, is another cause of the general poverty and want of comfort of the cottier. Under the excitement of war prices and the free trade in corn with Great Britain, agriculture advanced rapidly, and, consequently, so did the demand for labour; land rose in value, lessees were tempted to realize profit-rents by subletting their farms; and thus a class of middlemen was created, by whom the land was let in still smaller divisions, and at extreme rents. This system was an absolute bar to the encouragement which might have been given to the tenantry by the proprietors of estates. The occupying landlord pays a higher rent to the middleman than does the middleman to the proprietor, because the middleman exacts as much as he can get, without any reference to the future situation of the tenant: but the landlord has different feelings—he looks forward, and considers the reversionary interest which he has in keeping his tenant in prosperity, and his land in a state to yield a remunerating profit.

The habits of getting credit frequently at an advance of 50 per cent., of resorting to pawnbrokers, and of forming early marriages, contribute to the impoverishment of the labouring classes in Ireland. The poorer the individuals are, the more eager are they for wedlock; even the very beggars intermarry. It must, however, be admitted as some excuse, that early marriage is much encouraged by the Romish priesthood; and in fairness it must be added, that this practice contributes exceedingly to the morality of the lower classes. The superstitious regard to *wakes* and funerals, which has been handed down from ancient times, is often a deplorable drain on the slender resources of the peasant.

In considering the character of the Irish peasantry in general, it is refreshing to see some noble traits standing out in full relief against the darker shades. The Irish people are of acknowledged bravery, proverbial hospitality, affectionate to their parents and aged relatives, charitable to the mendicant, and evincing in many places, even under extreme distress, a decency of feeling, which renders them averse to soliciting eleemosynary assistance. The women, generally speaking, are modest and irreproachable in their conduct; and it must be added, that, notwithstanding the crime and wretchedness which oppress the country, the poor Irish are free from many species of vice which are but too common in other countries. During the hay and corn harvests of England and Scotland, the services of the Irish labourers are very important. They are generally sober, well-conducted and inoffensive; labouring hard and living hard, that they may bring their earnings home to pay the rent of their little farm or dwelling. A *spalpeen*, or harvest-man, carries home from four to eight or ten pounds; to do which, he is contented, while away, almost to starve himself. There is reason, therefore, to hope, that under a better state of things, the national character will rise to a standard much higher than it has yet attained.

no improvement may reasonably be expected from the happy change wrought of late years by the temperance societies, and especially by the Roman Catholic clergyman, the Rev T. Mathew, of which evidence was given in the Ballinasloe Fair of 1840, where, instead of twelve hogsheads, the quantity usually disposed of, it is believed that there were only eight gallons of whisky consumed.

The last, but by no means most miserable class in Ireland, is that of the common *vagrant*. Of these, some are beggars by profession; some are obliged, from loss of employment, to become what are called *walkers*; and others are mendicants for a time only, as when their husbands are reaping the harvests in England, at which time it is customary to lock up the house, and the wife and children *walk the world* until the traveller returns with his little hoard of hard-earned money. It may be asserted, that in every district of Ireland, excepting some peculiarly circumstanced portions of Ulster, there is a feeling of respect towards mendicancy, which tends to support and perpetuate it. The poor tenants of the cabins receive the wanderers, whether single or in groups; and carrying, as these do, their bedding along with them, a warm corner is allowed them, even in the only room possessed. "It is the humblest sort," say they, "that are really good to us." The vagrants that frequent fairs, markets, patrons, holy wells, and other places of religious or pleasurable resort, are better off than the other poor. A respectable evidence declared to the commissioners on the Poor-Law Inquiry in the county of Meath, that the beggars at fairs were "as jolly a set as ever he saw in his life;" and in more places than one, it was stated to the commissioners that the beggars were better off than the tradesmen or labourers.

Hitherto, the usual methods of supporting the pauper poor have been congregational collections, subscriptions, very extensive private charity, and of late years the application of the resources of the Mendicity Association; but the inefficiency of these means have ultimately led to the establishment of a *Poor-Law*, the general object of which is to relieve the destitution of the country. Under this system, assistance is proposed to be afforded to persons only in the workhouses of their respective parochial unions, which are now erecting throughout Ireland. It is calculated that a hundred workhouses, placed in the centre of so many unions, and capable of containing each from four to eight hundred persons, will be sufficient to accommodate all who are likely to apply for admission. For the better regulation of the system, it was enacted, that a board of guardians should be annually elected in each union, in number according as the commissioners shall see fit, the same guardians being eligible for the subsequent year. It appears that, so far as the poor-law system is as yet brought into operation, it is imperfect, and has not relieved the districts in which it has been carried into effect from the annoyance of mendicity, inasmuch as there is no compulsory law for retaining vagrants in the poorhouses; they therefore leave them at pleasure, to follow the more agreeable course of begging in the streets. Until such enactment be passed, Ireland, it would seem, will be subject to a severe taxation in support of the poor-law system, while at the same time it is not relieved of the evils of mendicancy. So far as the poorhouses are yet in operation, they seem to be well conducted; arrangements are made for the instruction of the younger portion of the inmates, and the details of food, clothing, and lodging, appear to be generally considered satisfactory.

POPULATION.

The population of Ireland was estimated by an acute statesman of the reign of Charles II. as being then about 1,100,000. Another estimate, formed in 1731, but upon data not perfectly to be relied on, made the population 2,010,221. This last number seems to have been doubled before 1788, till which time Ireland was almost exclusively a pastoral country. Since then, agriculture and commerce have borne more conspicuous parts in the national industry; but circumstances unfavourable to national happiness and wealth have also been strongly operative, and the progress of the people was, till a very late date, upon the whole, downward. In proportion to the unfavourable circumstances, and most of all where the circumstances have been the most unfavourable, the population has increased. It was, at the first regular census in 1821, 6,801,827; and at that of 1831, 7,767,401. What strikingly illustrates the principle here alluded to, is, that in Leinster, which contains populous towns and is a comparatively prosperous province, the increase in the ten years between these two census, was at the rate of 9 per cent.; while in Connaught, where there are few towns, but a numerous peasantry in a very depressed condition, the increase was 22 per cent. It is a recent discovery, but a very important one, that, below a certain point in comfort of life, population is apt to experience a rapid increase, to the aggravation of all existing evils. And it is to this evil, more particularly, that a well-regulated poor-law may be considered as addressed.

ANTIQUITIES.

The antiquities of Ireland may be classed under the heads of the *Cromleac*, the *Cairn*, the *Circle*, the *Pillar-Stone*, the *Barrow*, the *Dun*, the *Lis*, the *Rath*, the ancient *Stone-roofed Buildings*, and the lofty and beautifully built *Round Towers*. The name *Cromleac* is compounded of *Crom*, which signifies Fate or Providence, and *leac*, a stone, literally "the stone or altar of God;" and to what god they were dedicated sufficiently appears by the name retained by so many of these altars. They vary in size and form, and in most instances consist of three upright supporters, two at the lower and one at the upper end, upon which the alter-stone was balanced; underneath this, and between the uprights, a hollow is usually found, which is thought to have been for the purpose of facilitating the passage of cattle and children under the sacred fire—a custom which seems to be alluded to in the Scriptures, when the Israelites are reproached with passing their sons and daughters through the fire to Moloch, one of the names given to the sun.

Of the *Cairn* there were two kinds, the burying and the simple cairn, or high place made of stones flattened on the top. These artificial high places were usually situated on an eminence; and here, on festival days, especially the 1st of May and the 1st of November, the fires of Bel were wont to be lighted. At these times all household fires were extinguished, to be rekindled by a brand from the sacred flame—a practice which continued till the time of St. Patrick, who succeeded in putting an end to it. Tumuli of this description abound in all parts of the kingdom.

Closely connected with the cairn, are the circles of upright stones, usually called *Druidic Circles*. They frequently surround a cairn, as that of New Grange, in the county of Meath, where the stones are placed about one third of the whole height above the base: frequently they encircle a pillar-stone.

The *Pillar-Stone* is so frequently joined with the circle cairn, cromleac, and sacred grove, that it cannot be passed over in silence. Numerous instances might be pointed out of lofty upright stones in many parts of the kingdom, standing sometimes singly, but most commonly in conjunction with one or more of the above-mentioned relics of pagan times. Tradition says, that formerly the people collected round such stones for worship, which is confirmed by the common expression in Irish of "going

to the stone," for going to church or chapel. These stones are conceived by many to have given rise to the carved stone cross found in various churchyards, and of which one of the finest specimens is to be seen at Monasterboyce, in the county of Louth.

There are several kinds of tumuli remaining, of which the Irish names declare the original object. The *Lios* or *Lis*, which signifies a fortified house, was an artificial hill, sometimes approaching in shape to an ellipse, with a flat top, and an earthen breastwork or rampart thrown round the little plain on the summit, where was placed the dwelling, usually protected by a strong wattled paling, as is now customary among the Circassians. The *Duns* or *Doons* were places of strength, always perched on a rocky bold situation, and fenced by a broad wall of extremely large stones, which wall forms one of the distinctions between the dun and the lis. The *Rath* signifies a village or settlement: these abound in all parts of the island, and are of various sizes, standing sometimes singly, sometimes so as to form a chain of posts; and frequently may be seen a large head rath, where the chieftain lived, and its smaller dependent raths, on which his retainers dwelt.

Among the earliest and peculiar antiquities of Ireland, are the low *Stone-roofed Buildings*, with high wedge-shaped roofs: of these, a few instances still exist at Kells, Kildare, Ardmore, and Killaloe. The most remarkable relics of the olden times of Ireland are the lofty *Round Towers*, of which, perfect and imperfect, one hundred and eighteen have been enumerated in various parts of the kingdom. They are built with a wonderful uniformity of plan. They are all circular, of small diameter, and great altitude. In most of them the door is at some height from the ground; small loop-hole windows, at distances in the sides, give light to the spaces where the different floors once were; and generally there were four larger-sized windows round the top, immediately below the roof, which is high and cone-shaped. There are, however, two or three towers, in which it does not appear that there ever were any windows round the top. Of the excellence of the masonry, a proof was given some years ago by the tower of Mahera, which, in consequence of having been undermined, was blown down, and lay, at length and entire upon the ground, like a huge gun, without breaking to pieces, so wonderfully hard and binding was the cement with which it had been constructed. Various theories have been offered as to the purpose for which these mysterious buildings were erected; the only clear point seems to be that they were religious, as they are always placed near churches. They vary in height from 35 to 120 feet; the internal diameter from 10 to 16 feet, and the outer circumference from 46 to 56 feet. Their tapering shape forms one of their most marked characteristics.

Ancient weapons and golden ornaments are from time to time dug up in all parts of Ireland, as bronze swords, exactly like those discovered at Carthage and on the field of Marathon. Multitudes, also, of spear-heads of all sizes, made of the same mixed metal, and curiously shaped bronze rings, have from time to time been discovered, the use of which had long been a desideratum to antiquaries, when a recent event unexpectedly threw light upon the subject, and confirmed the conjecture of Sir William Betham as to their having been current money. A variety of golden articles have been discovered in many parts of the country, such as semilunar shaped disks, formed of thin plates of pure gold; torques, or large twisted collars for the neck; armlets, brooches, rings, pieces of gold, bell-shaped, but solid and fastened together, the use of which has not been made out; and some rings of the same shape as those of bronze, which have been proved by Sir William Betham to have been used as money.

Ecclesiastical Antiquities.—Under this head rank those buildings which may be considered as the most ancient after the Pagan remains, and which bear a peculiar character, differing from that of any extant elsewhere. Of these but few are now in existence. The stone-roofed church of St. Doulagh's, near Dublin, belongs to the earliest date; its plan and style are equally uncommon. The latter seems to have been a rude approach to the oldest Norman; it is low, and of great strength; the church, divided by a low-browed arch, seems to have had a small choir and a somewhat larger nave. There are also strangely disposed, at various heights, small chambers, apparently for the residence of the clergy. A part of the building is used as the parish church; and the old tower has borne the addition of a belfry, so excellent was the mason work. The beautiful and curious ruin at Cashel, called *Cormack's Chapel*, is Norman in character, and was probably the cathedral of that diocese previous to the English invasion. It is considered to have been built in the tenth century by Cormac, who was both king and archbishop. He died about A. D. 990. It is to be observed, that both here and at St. Doulagh's are crypts placed *over* the churches—a peculiarity known in Ireland only; the crypts in all other countries being underneath. In this very marked Irish-Norman style, there exist a few remains at Aghadoe near Killarney, at Clonathen in the county of Wexford, and near Bannow in the same county, in an ancient town, which having been, time out of mind, overwhelmed by the blowing sand from the coast, has only within a few years been discovered, but, protected by the sand, is in a high state of preservation. The peculiar character which marks these buildings, proves them to be examples of the Irish style subsequent to the age of the towers, and previous to that brought in by the British invaders. Ireland cannot boast of any ecclesiastical buildings of great richness or beauty; but there are some of respectable appearance. The two cathedrals of the capital, St. Patrick's and Christ-church, are at least elegant in the interior. The large cathedral of Galway, and that of Limerick, are both handsome buildings, as is the cathedral of Kilkenny. These are all in good order, and in daily use. There are numberless ruins of monasteries, abbeys, knights' preceptories, and churches, of which the chief are—*Kilconnel Abbey*, in the county of Galway; *Corcomroe*, in Clare, the finest ruin in Ireland; *Holy Cross*, in Tipperary; the *Old Cathedral*, on the Rock of Cashel; *Dunbrody* and *Tintern Abbeys*, in Wexford; *Jerpoint*, in Kilkenny; and *Lusk*, in the county of Dublin. Kilconnel and Lusk are remarkable for rude bas-reliefs in stone, which bear a degree of resemblance to the Egyptian hieroglyphics. Many of these still retain fragments of their former ornaments of frotted stone-work—Holy Cross in particular.

Military Antiquities.—The traveller in Ireland must be struck with the vast numbers of small castles, which stud the whole country. They chiefly bear date since the reign of Elizabeth, by whose orders they were raised as strongholds to overawe the wild Irish. They are usually high and square, with towers at each corner. Besides these fortalices, there are ruins of very large castles, so customarily attributed to King John, as to show that they were built in the early times. Of these the extensive ruin at Trim, in the county of Meath, affords a fair example, as being one of the largest, and also formerly the residence of the viceroy or chief governor. Parliaments were held within its walls, and money minted there and sent into circulation. A few of the ancient castles belonging to the old nobility still continue to be inhabited, as *Malahide*, Lord Talbot's at Malahide, and *Howth*, the Earl of Howth's, both in the county of Dublin; *Shane's Castle*, the residence of Earl O'Neil; *Portumna Castle*, on the Shannon, that of Lord Clanrickard; and *Kilkenny Castle*, the seat of the Marquis of Ormond.

LEINSTER.

T is is the largest province of Ireland, and contains the twelve counties of *Louth, Meath, Dublin, Wicklow, Wexford, Carlow, Kilkenny, Kildare, Queen's County, King's County, Westmeath,* and *Longford,* the whole forming a large tract of country on the east side of the island, and having Dublin at a central point on the coast. The scenery of Leinster is much varied. The county most remarkable for picturesque beauty is that of Wicklow, a short way south of Dublin; the hills, glens, and valleys are here rich in natural wood, and, bounded by an extensive prospect of the ocean, can hardly be exceeded in beauty. The principal points of attraction for tourists are Lough Bray, a woody ravine called the Dargle, and the Vale of Avoca, which is one continuous piece of sylvan pleasure-ground. Wexford, still farther south, may also, to a considerable extent, be described as a picturesque and fertile country; and, though the county of Meath is for the most part flat and tame, except along the banks of the Boyne and Blackwater, it can boast there of some spots of redeeming beauty, as an example of which, *Beau Parc,* the beautiful demesne of Gustavus Lambert, Esq., may well be mentioned; and in a large portion of the county the quantity of wood and the rich hedgerows give an almost English character to the landscape. Westmeath is remarkable for expansive lakes, and for the dry gravelly hills which give variety to its surface. The Queen's County, though a good deal disfigured by bog, yet boasts, at Abbeleix and Dunmore, of a great stretch of magnificent natural oak wood. The remaining part of Leinster cannot be considered interesting or peculiar in its general features. The King's County contains the greatest portion of the flat flow-bog, on the eastern side of the Shannon; towards Roscrea, where the Slieve Bloom Mountains terminate, there is some fine scenery, especially about the ancient castle of Leap.

Leinster may be considered as much superior to the other provinces with respect to agriculture; and some parts of Carlow, Kildare, and Wexford, are cultivated in a manner approaching in skill to that of the agricultural districts of England and Scotland. In stock, implements, rotation of crops, and the industry with which manure is collected and composts manufactured, there is a great and increasing improvement. Farming societies, ploughing-matches, and premiums for new and better breeds of cattle, have greatly tended to this increasing prosperity; and they only who have witnessed what these districts were previous to the Union, can appreciate the amelioration which has since taken place.

In Kilkenny and its vicinity, the blanket trade was carried on to some extent, but latterly it has been in a very declining state. Near Dublin are some extensive paper manufactories, and in the county of Meath is a large flax-mill. Generally speaking, however, there are but few manufactures in Leinster. There is from its chief towns a considerable export of agricultural produce.

The counties of Wicklow and Wexford contain an industrious and thriving population; and because industrious, the people are able to pay, from soils not superior to those of other districts, rents which would be intolerable in other parts of Ireland. The Wicklow peasantry are reckoned the finest in the world, and are proverbial for their handsome features and fine Roman profiles, and still more so as being a respectful, quiet, and well-conducted people. The county of Meath is remarkably fertile; but being less subdivided, is therefore less populous than any other part of Ireland, considering the richness of its soil. The same prosperity as that in Wicklow and Wexford, though perhaps, in a smaller degree, prevails in Kildare, Carlow, and the Queen's County. One of the chief causes of this prosperity is, that a large portion of the population receive money payments for their daily labour, and another, that the *cottier* and *con* or *corn acre* systems are here less resorted to. The wages of Leinster are usually a shilling a day in summer, and in winter from eightpence to tenpence, without diet. The average rent for arable land is from £1 to £1, 10s., and for pasture-land from £2 to £3 per acre. The general diet of the peasantry is potoes, milk, stirrabout, eggs, butter, bacon, and herrings. Their dwellings are confessedly superior to those of Munster or Connaught. The resident gentry are more numerous, and take a great interest in the well-being of their tenantry. Leinster, therefore, may altogether be pronounced a much improved part of the country.

As the woollen and silk manufactures are still carried on in Dublin and other parts of Leinster, a slight sketch of their history may not be out of place in the account of that province. So early as the reign of Henry III., Irish woollen manufactures were imported from Ireland to England, duty free; and so excellent was their quality, that, from 1327 to 1357, they were exported to Italy, at a time when the woollen fabrics of the latter country had attained a high degree of excellence. The prosperity of the trade is noticed in an act of Elizabeth: and so flourishing was it in the time of Sir William Temple, that he became apprehensive lest it should interfere with that of the English. In 1688, the woollen manufacture was established to a considerable extent in the liberties of Dublin. But this prosperity was soon interrupted by the English presenting a petition for the imposition of such heavy duties on the exportation of wool, as greatly injured the trade. It never, however, became extinct in the liberties, though it now extends only to the manufacture of coarse fabrics. In 1773, the Dublin Society, anxious for its revival, procured an order that the army should be clothed with Irish cloth. This employment, however, became soon monopolized by one or two great houses which had Parliamentary interest: one of these failed in 1810, and the failure was followed by the bankruptcy of almost the entire woollen trade of Dublin; for the general credit was so much affected, that the banks refused to discount the bills of the manufacturers, and consequently the crash became general. The trade is now almost confined to the city of Dublin, where good hearth-rugs and carpeting are made; and favourable auguries are held forth of the factory of Mr. Willans, in particular, from the competition which he is able to stand against the cloth markets of the United Kingdom.

The *silk* trade was introduced by the French refugees, and about 1693, fully established by them in the liberties of Dublin. In 1774 an act was passed, placing it under the direction of the Dublin Society, for the extent of two miles and a half round the castle; and that society was empowered to make regulations for its management, which it accordingly did, and also opened a silk warehouse, and paid a premium of five per cent. on all sales made therein. But this warehouse was ruined by an act passed about the year 1786, prohibiting any of the funds of the Dublin Society from being applied to support any house selling Irish goods either wholesale or retail. This act gave to the manufacture a check by which hundreds of people were thrown out of employment. According to a return made in 1809, there were still 3760 hands engaged in it, who, after the passing of this cruel act, struggled to support the trade; but when the protecting duties were taken off in 1821, and steam communication opened with England, the Irish market was inundated with goods at a smaller price than that at which her native fabric could be produced, and thus the ruin of the trade was completed. The tabinet fabric of silk and worsted, for which Dublin has long been famous, is the only branch of the silk business which has not materially suffered from these discourage-

ments At present, silk tabareas of great beauty, and rich silk velvets, equal to those of France, are manufactured in Dublin.

Chief Towns.

The chief towns in Leinster are *Dublin, Kilkenny, Drogheda, Wexford, Maryboro, Mullingar,* and *Trim.*

Dublin, the principal town in Leinster, and the capital of Ireland, is situated at the margin of a beautiful bay, on a generally flat piece of country, through which flows the River Liffey, and is, therefore, agreeably placed both for commerce and the accommodation of a large population. In point of size, Dublin occupies a place between Edinburgh and London, and its appearance never fails to surprise and delight the stranger. In external aspect, it is essentially an English town, being built of brick in a neat and regular manner, but abounding in a class of elegant public structures of stone, which resemble the more substantial embellishments of Paris and other continental cities. The river, flowing from west to east, divides the city into two nearly equal portions, and is a striking feature in the general plan. The leading thoroughfares of the city are easily comprehended. First, from east to west, there is the double line of houses and quays bordering upon the river, the lower part of which forms a harbour, and is crowded with vessels. Crossing this line at right angles, is the great line formed by Sackville, Westmoreland, and Grafton streets, the first and second of which are connected by Carlisle Bridge, the lowest in a range of eight or nine which span the river at various distances from each other. Parallel to the quays, on the south side of the river, there is a shorter arterial line of great importance, formed by College Green, Dame street, Castle street, and Thomas street, being terminated to the east by the buildings of the University. Though the ancient part of the city occupies the south bank of the river, there is a portion of the mean and elegant on both sides; the streets and squares of the wealthy being here, contrary to the usual rule, in the north-east and south-east districts. All the great lines are formed by houses of lofty and elegant proportions, chiefly devoted to commerce; and perhaps no city can present a more splendid series of shops and warehouses. Sackville street, a hundred perches in length and six in width, with a noble monumental pillar in the centre, and some of the finest public buildings in the world lending it their effect, must impress every one as something worthy of a great city. The spaciousness of several of the squares in the aristocratic districts is equally impressive. Merrion Square is half, and St. Stephen's Green nearly a whole mile, in circumference, the latter containing seventeen acres of pleasure-ground in the centre.

Dublin.

On first walking into the streets of Dublin, the stranger is apt to see, in the throng of carriages and foot-passengers, nothing more than what he expects to find in all large cities. He soon observes, however, that, besides the usurious class who occupy the better kind of vehicles, and the busy well-dressed crowd who move along the foot-ways, there is a great multitude of mean and mendicant figures, such as are only to be found in a small proportion in other cities. This is the very first peculiar feature which the stranger detects in Dublin, and it is an unfortunate one. It is explained when we learn, that, of the large population of Dublin—supposed to approach three hundred thousand—fully three-fourths are beneath what is recognised in Britain as the middle rank. Thus the most respectable streets in Dublin, and the most elegant figures which appear in them, seem isolated in the midst of penury and meanness.

The public buildings of Dublin boast an elegance much above what might be expected from the general character of the city. In sailing up the river, the eye is first attracted by the Custom-house, a large and splendid edifice in the well-known taste of the Adams, surmounted by a dome, and very happily situated upon the north quay. The Post-Office, in Sackville street, is in that graver form of the Grecian style which has more recently come into favour, extending above two hundred feet in front, with a noble portico surmounted by a pediment. The simultaneous starting of the mail-coaches at a certain hour every evening from the court of this building, is one of the sights of Dublin. Opposite to it is a pillar in honour of Nelson, surmounted by a figure of that hero. At the upper extremity of Sackville street is the Lying-in Hospital, a beautiful building, with which is closely connected the more celebrated Rotunda, together with an extensive plot of ornamental ground. The Four Courts —also a most superb structure—overlooks the river at a point considerably removed to the west, and completes the list of remarkable buildings in the northern division of the city. To the south of the river, the objects worthy of especial notice are more numerous. The buildings of the University (founded by Queen Elizabeth in 1592) occupy a conspicuous situation on the great transverse line of streets which has already been mentioned. Beneath an elegant Grecian front three hundred feet in length, an archway gives admission to a succession of spacious squares, chiefly composed of brick domestic buildings, and containing a theatre for examinations, a museum, a chapel, a refectory, a library, and other apartments necessary for the business of the institution. In the museum is preserved an ancient harp, generally represented as that of Brian Boroimhe, a famous Irish king of the tenth century. There are usually about two thousand students in attendance at the University. Divided from this building only by the breadth of a street, is the Bank of Ireland—formerly the place of assembly of the Irish Houses of Parliament. The deep colonnaded front of this building is one of the most beautiful pieces of architecture, not only in the British dominions, but in the world: it carries a charm like a fine picture. The hall where once the Commons of Ireland assembled —where the eloquence of a Grattan, a Curran, and a Flood, was once heard—is now altered to suit the purposes of a telling-room; but the House of Peers remains exactly as it was left by that assembly, being only occasionally used for meetings of the Bank directorate. The latter is a small but handsome hall, adorned with tapestry representing transactions in the subjugation of Ireland by King William—the battle of the Boyne, the breaking of the boom, and so forth, as also a few appropriate inscriptions.

In Kildare street, at no great distance from the College and Bank, the halls of the Royal Society of Dublin present a powerful claim to the attention of strangers, in the great variety of curiosities, pictures, and models, with which they are filled. In a perambulation of the city, the Castle is the next object worthy of notice. This ancient seat of the viceregal government, to which rumours of plots and insurrections have been so often brought by terror-struck spies or remorseful particistors

is placed on slightly elevated ground, in the midst of the old or southern division of the city. It consists of two courts, containing certain public offices, and the apartments of state used by the Lord-Lieutenant. In the lower court is the Castle Chapel, a beautifully constructed and beautifully furnished modern Gothic place of worship, the whole materials of which are of Irish production, and which cost above £40,000. The service performed here every Sunday forenoon, graced as it is by the finest vocal and instrumental music, while a rich "religious light" streams through stained windows, and is reflected from the gorgeous stalls of civil and ecclesiastical dignitaries, is one of the most attractive things in Dublin. The state-apartments of the viceroy are in the taste of the middle of the last century, and are elegant, but not remarkable for grandeur. In one is a bust of Chesterfield, who was Lord-Lieutenant in 1745. The most remarkable room is the ball-room, denominated St. Patrick's Hall, which is spacious and lofty, and among other attractions has a ceiling ornamented with pictures, representing transactions in the history of Ireland.

In Ireland, old ecclesiastical structures are usually more curious for their antiquity than their beauty. Accordingly, the exterior of St. Patrick's and Christchurch, the two cathedrals of Dublin, is apt to appear ungainly to an eye fresh from Westminster or Melrose. In the former building, nevertheless, the interior of the choir, in which service is usually performed, will impress every mind by its lofty proportions, its pompous monuments, and the dark stalls and niches, surmounted with the helmets and banners of the knights of the order of St. Patrick. In visiting this ancient church, the predominant thought is—SWIFT. We look for his dwelling as we approach, and for his tomb when we enter—such is the power which genius has of fixing the feelings of men for all time upon every external thing connected with it! The deanery still exists in St. Kevin street, containing the portrait of Swift from which all the engraved likenesses have been derived. The streets immediately surrounding St. Patrick's Cathedral are the meanest and vilest in the city. The houses have a ruinous and forlorn look, and the pavements are crowded with a population of the most wretched order. These streets are filled with shops, but the trades to which they are devoted serve rather to betray the misery than to manifest the comfort of the people. Dealers in old clothes, pawnbrokers, spirit-dealers, and persons trading in offals, almost the only kinds of unimul food indulged in by the lower orders of the people, abound.

At the western extremity of Dublin, on the north side of the river, is the celebrated public promenade denominated the Phœnix Park, said to consist of about a thousand acres. Not only does this park greatly exceed those of London in extent, but it is questionable if even the Regent's Park, after all the expense incurred in ornamenting it, will ever match this domain in beauty. The ground is of an undulating character, and is covered with groups of fine old timber and shrubbery, amidst which are the domestic residences of the Lord-Lieutenant and his principal officers, besides some other public buildings, and a tall obelisk in honour of the Duke of Wellington's victories. A zoological garden has lately been added to the other attractions of the Park.

Dublin was formerly a busy literary mart, in consequence of the state of the copyright law, which allowed of cheap reprints of British books being here issued. After a long interval, the activity of its publishers has lately revived, and there are now several houses which afford considerable encouragement to native talent; among others, those of Mr. Tims and Mr. Milliken in Grafton street, and that of Messrs. W. Curry, Jun., and Co., in Sackville street. The latter has had the merit of for the first time establishing a respectable periodical work in Ireland, the *Dublin University Magazine*, which has been carried on with increasing success for a number of years.

Dublin possesses a number of beneficiary institutions, conducted on a scale of great liberality; also several religious and educational societies, whose operations are extended over the whole kingdom. The trade carried on in the town refers chiefly to home consumption; and, excepting tabinets or poplins, it is not distinguished as the seat of any manufacture. There is very little foreign export from Dublin. Its principal imports are—timber from the Baltic; tallow, hemp, and tar, from Russia wine and fruits, from France, Spain, and Portugal, tobacco, bark, and spices, from Holland; and sugar, from the West India islands.

The most important branch of its commerce is that carried on with England, chiefly in connection with Liverpool, to whose market there are now large exports of native produce. Though the Liffey forms the harbour of the port, vessels of large burden, and steamboats, have an opportunity of preferring the harbour at Kingston (formerly called Dunleary,) at the mouth of the bay, on its southern side. This harbour, which is constructed on a magnificent scale, with the neat town adjacent, may at all times be readily reached by a railway from Dublin, which proves a great convenience to the inhabitants. At the opposite side of the bay from Kingston, is Howth, whose celebrated "hill" forms a distinguishing land-mark.

The number of light private vehicles in Dublin is one of its most remarkable distinctive features. These are generally of the kind called cars, drawn by one horse, and having a seat on each side, admitting of two or more persons sitting with their faces outwards. To keep a car is one of the highest aims of the ambition of a Dublin tradesman. "Previous to the Union," says an intelligent writer, who has been consulted with advantage, "Dublin was the constant residence of 271 temporal and spiritual peers, and 300 members of the House of Commons. At present about half a dozen peers, and fifteen or twenty members of the House of Commons, have a settled dwelling within its precincts. Other persons of this exalted class of society, whom business or amusement may draw to the capital occasionally, take up their residence at the hotels, which are numerous in the city. The resident gentry of Dublin now amount to about 2000 families, including clergymen and physicians, besides nearly an equal number of lawyers and attorneys, who occasionally reside there. The families engaged in trade and commerce are calculated at about 5000, and the whole may yield a population of 60,000 or 70,000 in the higher and middle ranks of society. The change which has taken place, though injurious to commercial prosperity, has perhaps in an equal proportion proved beneficial to public morals; the general character of the inhabitants, which was once gay and dissipated, has now become more serious and religious, and those sums formerly lavished on expensive pleasures, are now happily converted to purposes of a more exalted nature. Formerly there were seven theatres well supported; at present the only one which remains is frequently thinly attended. Club-houses and gaming-tables are nearly deserted; and even among the lower classes, vice of every kind has visibly diminished." In 1831 the population of Dublin was 204,155.

Kilkenny, the capital of the county of the same name, situated on the River Nore, was formerly a town of great consequence, as its ancient castle, the ruins of its embattled walls, and churches testify. Till lately it carried on a considerable trade in the manufacture of woollen cloths and blankets; but these branches have in a great degree fallen off, and the business is now confined to the retail of necessaries for its inhabitants, and the sale of the agricultural produce of the district. The city contains seve-

ral good streets, which are respectably inhabited, both by private families and tradesmen; but the suburbs are miserable. The most conspicuous ornament of the city is the fine baronial castle of the Marquis of Ormond, full of historical associations, rising boldly over the Nore. The Cathedral of St. Canice, built in 1202, is not excelled by any of the ancient ecclesiastical buildings in the kingdom, except St. Patrick's and Christ Church in Dublin. The town possesses a number of respectable schools, and various asylums and other beneficiary institutions. Near the town there is a marble quarry of considerable local importance. Population in 1831, 23,741.

Drogheda, in the county of Louth, and situated on the Boyne, in the line of road from Dublin to Belfast, is a town of respectable appearance, and the seat of an industrious population. From the time the English settled in Ireland, this town was called *Tredagh*, and considered of such importance that Parliaments were formerly held in it. In 1649, it was stormed by Cromwell, and the inhabitants put to the sword, except a few who were transported to America. Five steamers ply regularly between Drogheda and Liverpool or Glasgow, carrying out corn, cattle, sheep, pigs, and fowl, and bringing back cotton cloth, timber, leather, tobacco, salt, and iron. Drogheda contains three Episcopal churches—St. Peter's, St. Mary's, and St. Mark's, which is a chapel of ease to St. Peter's; four Roman Catholic chapels, two convents, and a friary. The chief civic buildings are a handsome tholsel, custom-house, mayoralty-house, jail, and linen-hall. The town does not bear a literary character: it has, however, four tolerably good booksellers' shops and a reading-room: there is also a mechanic's society in Drogheda. Its principal manufactories are a flax-mill, two founderies, salt works, a distillery, three breweries, one of which, belonging to Mr. Cairns, is celebrated for the superior quality of its ale, which is in constant demand in the English and foreign markets. There are, besides, several large flour-mills, and a soap and candle manufactory. There is a salmon-fishery on the Boyne, close to the town; and cod, haddock, plaice, soles, and gurnet, are abundantly caught along the coast. The linen trade is still carried on in Drogheda, though it is at present in a very depressed condition. The time of its greatest prosperity was from 1814 to 1820, during which period 4000 pieces of linen were averaged to be the weekly product. There was also a temporary revival of the cotton trade in this town; but in the commercial panic of 1825–6, many of the Drogheda weavers passed over to Manchester and Oldham, others went to France, and a large body emigrated to America, in consequence of which the cotton business ceased. The population in 1831 was 17,366.

MUNSTER.

Munster contains six counties, *Clare*, *Cork*, *Kerry*, *Limerick*, *Tipperary*, and *Waterford*, and may be considered as that part of Ireland in which the national character, and the national habits of all kinds, are maintained in their greatest purity. Some of the largest seats of population in the island, as the cities of Cork, Waterford, and Limerick, are situated in Munster. The province contains many tracts of beautiful scenery, and one in particular, which is allowed to be unequalled in the kingdom—the celebrated lake district at Killarney.

The *lakes of Killarney* are situated in the bosom of the mountainous county of Kerry, and are annually visited by travellers from all parts of the island, as well as from neighbouring countries. They are three in number, of unequal size, and considerably varied with respect to surrounding scenery, though that may be described as generally of a mountainous character. Lough Lane, or the Lower Lake, by far the largest of the three, is skirted on one side by the level and well-cultivated country surrounding the pleasant village of Killarney; on the other side rise the Glena and Tomies Mountains. In this lake there are a number of wooded islands, one of which contains the ruins of an abbey, and another the remains of an ancient castle. On the shore, towards the east, is the beautiful ruin of Muckross Abbey. Divided from the Lower Lake by the fine wooded promontory of Muckross, but accessible by two channels of level water, is the Middle Lake, called also Turk Lake, from the name of the mountain at whose foot it reposes. Over and above the islands which stud the surface, the beauty of these two sheets of water may be said to consist in the irregular promontories and slopes, generally wooded, by which they are surrounded, and above which the mountains tower in sterile grandeur. In many nooks of the scenery, elegant mansions look out upon the lakes; in others the mountain streams are seen descending in glittering cascades. The Upper Lake, the third of the series, is three miles apart from the middle one, on a nigher level, and totally embosomed amidst the hills. A stream descending from the one to the other can be passed in a boat; and, at a particular place on the passage, it is common for tourists to have a bugle played, in order to enjoy the oft-repeating echoes which it awakes in the neighbouring hills. The Upper Lake, having the wooded heights of Dericunighy on one side, the round-headed Purple Mountains on the other, and, at the head, the bare many-coloured ridge of Macgillicuddy's Reeks, while the surface is broken by a variety of sylvan islets, presents a landscape of enchanting loveliness. In connection with the lakes, there is a narrow rugged vale, named Dunloe, which is usually taken in by a tourist in a survey of this fine scenery.

Among other beautiful places in Munster, we can only particularize Glengarriff, a rugged and most picturesque vale near the head of Bantry Bay; the banks of the Blackwater, between Lismore and Youghal; the River Lee, below Cork, and the fine natural harbour (the *Cove of Cork*) in which it terminates; and the lofty iron-bound coasts of Clare, amidst which are some scenes of uncommon grandeur.

The soil in the southern parts of Limerick and Tipperary is perhaps not inferior in fertility to any portion of Europe. The Corkass lands of the former, and the Golden Vale of the latter, are celebrated for their extraordinary richness. These districts are chiefly appropriated to the feeding of black cattle. Wheat husbandry is cultivated throughout the limestone districts of Tipperary, Clare, and Limerick, while dairy farming is followed in the mountain districts of Kerry and Waterford. The potato culture necessary to supply the wants of an overdense population, is eagerly pursued throughout the whole province; and it is a deplorable fact, that a large portion of that population have no other food during the greater part of the year. The grass farms let in large divisions of from 150 to 400 acres, at from 40s. to £3 per acre. In the dairies of the county of Cork, the great butter country of Munster, it is no uncommon thing to have from one to two hundred cows in profit; the advantage of which is, that a cask is filled at once by butter, all of the same churning. The sweet thick cream only is churned, and that every morning. The pastures of these dairy-farms are highly manured, and are never broken up for tillage, experience having taught the dairy farmers that the older the sward the richer is the milk. Some of these grass lands have not been ploughed for a hundred and fifty years.

Daily labourers are usually paid from 8d. to 10d. per day; or, if engaged by the year, from 6d. to 8d. In the latter case, it is supposed that the labourer has a house and grass for a cow, at what is called a moderate rent, and which, in the estimation of the labourer, is equivalent to additional wages. The food of a great part of the Munster peasantry consists of potatoes; to this is usually added milk, and, if they live near the sea, hake or herrings. In Cork, but few of the labouring poor have

cows, because milk can be had in abundance at a moderate price at the dairies. It is, however, very customary to have ewes, which not only supply a tolerable quantity of milk, but furnish clothing. The women spin and dye the fleeces, and have them woven into thick frieze, and fulled at the village fulling-mill: from this practice, the southern Munster men are remarkably well clothed. The cottages, or rather cabins, are, generally speaking, wretched; but it may be stated, that in the dwellings and furniture of the people there is a growing improvement. The character of the Munster peasantry may be considered as of mixed good and evil—the evil arising from a total want of restraint in early childhood, bad education, or, as frequently happens, none at all. Female education is peculiarly neglected; and it is deplorable to see marriages contracted when the wife has few capabilities for managing a family, and rendering her husband comfortable, or his house a happy home.

Generally speaking, the trade of Munster consists in the export of provisions and agricultural produce, as wheat, oats, and potatoes, to a large amount.

There is on the Shannon an active fishery for trout, herrings, &c., and abundance of excellent fish are sent into Limerick, Ennis, Kilrush, and to the county of Kerry. Along the coast of Cork there is a fishery for pilchards, herrings, and other kinds of fish, which are caught in great quantities, so that frequently the farmers manure the fields with sprats.

Chief Towns.

The leading towns of Munster are *Cork*, *Limerick*, and *Waterford*. The name *Cork* is derived from the Irish word *Corcah*, which signifies a marsh. This city, which ranks as the second in Ireland with respect to population and commercial importance, stands on the River Lee, which, through several channels, pours its waters into the harbour, from whence the tide flows to some distance above the town. The streets are built along the river channels, which, being all quayed, give the city somewhat of a Venetian character: of late years, however, the narrower have been arched over, and only the main streams, in which the merchant vessels lie, left open.

The Episcopal ecclesiastical buildings of Cork consist of seven parish churches, the Cathedral of St. Fin Barry, St. Luke's Chapel of Ease and Free Church, the Chapel of the Foundling Hospital, and the Church of St. Michael's at Blackrock: two other churches are in progress. There are four Roman Catholic chapels, three new ones nearly completed, and four friaries. There are numerous dissenting chapels—two meeting-houses for Wesleyan Methodists, one for the Primitive Wesleyans, one for Anabaptists, two for Presbyterians, one for the Society of Friends, and two for two other small bodies of dissenters. A new Scotch church is in progress. The principal public buildings are, the Bishop's Palace, which stands on a height overlooking the town; a new jail, a little to the west of the city; the Custom-house, large and handsome barracks, the City Library, the Reading-Rooms, the infirmaries, the Chamber of Commerce, the Steam-Packet Office, and a well-built and spacious court-house, having in front a pediment supported on six Corinthian columns and surmounted by an emblematic group of colossal figures. There is now in progress a new savings' bank, an extensive and ornamental building, but not more than half erected; also a new banking-house of cut stone for a branch Bank of Ireland; a new and showy corn-market house; and an extensive workhouse for the Poor-Law Union, about three-quarters of a mile from the city.

Cork boasts of many schools—the Blue-Coat Hospital, for twenty-two sons of reduced Protestants; the Green-Coat Hospital, for twenty children of each sex, to be brought up Protestants; the Cove Street Infant, Diocesan, Lancastrian, and Female Orphan Schools; the diocesan schools for the united diocese of Cork and Ross, and a free school founded by Archdeacon Pomeroy.

Among the charitable institutions in the city are—Bertridge's Charity, where are maintained seven old Protestant soldiers; Skiddy's Almshouse, where twelve aged women receive £29 yearly; Deane's Schools, where forty poor children are clothed and taught gratis. There is, besides, a masonic female orphan asylum, and several almshouses. Indeed, in proportion to its size and wealth, the city of Cork bears a peculiarly high character for benevolence.

There are five societies here, whose objects are almost entirely scientific—the Royal Cork Institution, the Cuvierian, the Scientific and Literary Societies, the Mechanics' Institute, and the School and Library in Cook street; one public subscription, and several circulating libraries; eighteen Protestant societies, devoted to religious purposes; four benevolent societies, for the relief of the distressed; five philanthropic societies, two lunatic asylums, and a school for instructing the deaf and dumb poor in George's street.

The chief exports of Cork are grain, butter, cattle, and provisions; its chief imports, wine, tea, sugar, and coals. From the parliamentary returns, it appears that, during the five years ending 1834, the average annual number of vessels entering the port of Cork, was—British, 135, tonnage, 26,438; and foreign, 29, tonnage, 3384. Steam-vessels communicate between Cork and Dublin, Bristol and Liverpool; and steamboats also ply daily between Cork and Cove. The population of Cork, according to the census of 1831, was 107,016.

Limerick, the chief city of the west of Ireland, is situated on the Shannon, near the place where that noble river expands into an estuary. It consists of the Old and New Town, respectively situated on the north and south sides of the river, and connected by an elegant modern bridge. The new city contains many good streets, filled with handsome shops; but the old town is confined, dirty, decayed, and inhabited by a very miserable population. Limerick contains a handsome cathedral of some antiquity, situated in the old part of the city, six Episcopal churches and a chapel of ease, meeting-houses belonging to the Presbyterians, Independents, and the Society of Friends, with five Roman Catholic chapels, three friaries, and one nunnery. The principal public buildings are the Exchange, the City Court-house, the City and County Jail, the Police Barrack, the Custom-house, the Commercial Buildings, the Linen-Hall, the Market, and two banks. Though Limerick is not a particularly literary city, it has an excellent library, and some very good booksellers' shops. The principal school at Limerick is the Diocesan, but there are many private day and boarding schools. There are many charitable institutions, as the County Hospital; the House of Industry for the aged and infirm, widows, orphans, young females, and deserted children; the Corporation Almshouse; Dr. Hall's and Mrs. Villiers's Almshouses.

With regard to the trade of Limerick, it has been observed, that though it has increased with the extension of the city, it has done so by no means in an adequate proportion, when its peculiar advantages are considered; the Shannon, which connects it with Clare, Kerry, Waterford, and Tipperary, affording it innumerable commercial facilities. The quays of Limerick are nevertheless a scene of considerable bustle, though chiefly frequented by vessels for the export of the native produce. Provisions to the amount of 75,000 tons are here shipped annually. The population of Limerick, in 1831, was estimated to be 66,555.

Waterford, the chief town of the county bearing its name, and a large sea-port, is situated on the Suir, a few miles from its junction with the sea. Native produce, to the value of £2,000,000, is annually exported from this city; but the imports are comparatively unimportant.

There is here a fine cathedral, founded by the Ostmen, and endowed with lands by King John, and several churches, meeting-houses for the Presbyterians and the Society of Friends, a French church for the Huguenots, and several abbeys and friaries. The principal buildings are the Bishop's Palace, the Exchange, and the City Jail. Among its schools are the Latin Free-school, and the Blue Boys' Free-school, in which seventy-five are instructed and partly clothed gratis, and the boys apprenticed to different trades. The population in 1831 was 28,820.

ULSTER.

The most northerly of the provinces is ULSTER, containing the counties of *Antrim*, *Armagh*, *Cavan*, *Donegal*, *Down*, *Fermanagh*, *Derry*, *Monaghan*, and *Tyrone*. The province of Ulster is hilly. The scenery is in general picturesque, especially in the vicinity of its chief towns, Derry, Belfast, and Armagh. In the county of Antrim, the country from Glenarm to Bengore Head presents a succession of striking and romantic views. The most remarkable feature of this scenery is the peculiar conformation of the basaltic columns with which it abounds, and of which the arrangement is strikingly displayed in Fair Head and the *Giant's Causeway*. Bengore, one of the promontories of the causeway, lies about seven miles west of the little town of Ballycastle: though generally described as a single headland, it is composed of many small capes and bays, each bearing its own proper name, and of these capes the most perfect is *Pleaskin*. The summit of Pleaskin is covered with a thin grassy sod, which lies upon the rock, the surface of which is cracked and shivered. About ten or twelve feet from the top, the rock begins to assume a columnar character, and standing perpendicularly to the horizon, presents the appearance of a magnificent colonnade, supported on a foundation of rock nearly sixty feet in height. About eight miles from Pleaskin is *Fair Head*, the easternmost head of the causeway, which presents a huge mass of columnar stones, of coarse texture, but many of them more than two hundred feet in height. Some of these gigantic stones seem to have fallen from the top, and now present to the eye of the spectator the appearance of groups of artificial ruins. The part which may more properly be called the *Giant's Causeway* is a kind of quay, projecting from the base of a steep promontory some hundred feet into the sea: it is composed of the heads of pillars of basalt, which are placed in close contact with each other, forming a sort of polygonal pavement, somewhat like the appearance of a solid honeycomb. The pillars are jointed, and their articulation curiously exact, the convex termination of one joint always fitting with precision into a concave socket in the next. Within about two miles of the Giant's Causeway stands Dunluce Castle, situated on the summit of a rock whose base is washed by the ocean, by the ravages of which great part of the building was suddenly swept from its foundation. The mansion and offices stand upon the mainland, divided from the fortress by a deep cut which separates the rock on which the castle is placed. Over this chasm lies the only approach to the building, along what was one of the walls of the drawbridge: should the passenger miss his footing on this narrow path, there is not the slightest protection on either side to save him from the abyss beneath.

The soil of Ulster varies much. In the counties of Armagh, Down, Antrim, Derry, and Monaghan, it passes from a deep rich fertile clay to a dry sandy or gravelly loam; while in Donegal, Tyrone, Fermanagh, and Cavan, a great proportion of it is cold, wet, and spongy. Tillage is, in general, in an improved state throughout this province; and, though the old Irish plough and the slide car are still occasionally used in the remoter parts, many of the modern implements of husbandry have been introduced, especially in Down and Londonderry. The English spade has nearly displaced the long or one-sided spade; the angular harrow and the thrashing-machine are much in use, and the Scotch plough has almost superseded the heavy Irish one. The corn crops most general are oats, bere, barley, and a small proportion of wheat. Barley is in Derry said to pay the summer's rent, and flax the winter's. Potatoes are largely planted by rich and poor, and gentlemen-farmers cultivate turnips and mangel-wurzel. Lime and peat are the most usual ingredients of the manure employed in the inland districts; while in the maritime counties, sea-sand, sea-weed of different sorts, and various kinds of shells pulverized, are used in addition. From the wetness of the soil, in some of the northern parts of Monaghan, the manure is usually carried to the fields in baskets, called *bardocks*, which are slung over asses' backs or the shoulders of the poor women. A small but hardy race of horses is reared in the island of Rathlin or Raghery; and the old Irish sheep still prevails in and near Carey, in the county of Antrim. Pigs, goats, and donkeys, are numerous, the latter being much used in the counties of Cavan and Monaghan. A good deal of butter is sent to the markets of Belfast, Antrim, and Derry, from the various dairies scattered through Ulster.

Whatever were the manufactures of Ireland before the time of James I., they were swept away in the long series of wars between government and the local chieftains in the days of the Tudors; and the Scottish settlers in the north of Ireland, and those English whom Boyle, Earl of Cork, brought into Munster, may be considered the introducers of nearly all the manufactures that now exist in Ireland. During the reigns of Charles I. and II. much attention was paid to them; and the exertions of Lord Strafford, Sir William Temple, and the Duke of Ormond, caused the establishment of the linen trade to be attributed successively to each. The Duke of Ormond not only procured several acts for its encouragement, but sent Irishmen to Flanders to be instructed in the details of the flax manufacture; and also established a linen factory both at Chapelizod, near Dublin, and at Carrick-on-Suir. In the reign of William III., the linen business rose to still greater importance, from the compact between the English and Irish merchants to discourage the woollen and promote the linen trade; for which purpose they procured a statute to be passed, levying additional duty on Irish woollen goods, from a jealous fear that the prosperity of the Irish woollen trade was inconsistent with the welfare of that of England. Another impetus was given to the linen trade by the emigration of the French manufacturers, after the edict of Nantes, of whom a large number took refuge in Ireland; and Mr. Louis Cromelin, a leading manufacturer, obtained a patent for improving and carrying it on, and his efforts were crowned with considerable success. In the 9th year of Queen Anne, a board of linen and hempen manufactures was established, and linen allowed to be exported duty free. In the 8th of George I., a grant was given to build a linen-hall, and another to encourage the growth of flax and hemp. Previous to 1778, bleached linen was sold in the fairs, the manufacturer being the bleacher; but when the manufacture extended, bleaching became a separate business. Considerable sums had been from time to time voted by parliament for its support; and during the eighteenth century the trade continued to advance, until the check it received during the American war. On the re-establishment of peace it revived, and was at its greatest height from 1792 to 1796. Since this period it has considerably increased, and, though deprived of all artificial props in the form of bounties, is now a flourishing department of industry. Belfast is the great centre to which the linens, not only of Ulster but also of the weaving districts in the west of Ireland, are sent for sale; and from hence large quantities are exported to

foreign countries. The linen trade prospers at Castlewellan, Rathfriland, and Banbridge, in the county of Down, and also at Lurgan in the county of Armagh, where the weavers are at once weavers and manufacturers. At Dungannon, in the county of Tyrone, it has greatly declined, and is in Donegal chiefly confined to those who work for farmers or market sale.

The province of Ulster was also the seat of the first cotton manufactory introduced into Ireland. In 1777 the manufactures were in the lowest state of depression. To give them some stimulus, Mr. Joy conceived the plan of introducing cotton machinery from Scotland; and a firm for this charitable purpose was formed, of Joy, M'Cabe, and M'Craken; and a mill for spinning twist by water was erected by them at Belfast in 1784, at which time the manufacture may be said to have been established; and so rapidly did it spread, that, in 1800, in a circuit of ten miles, comprehending Belfast and Lisburn, it gave employment to 27,000 individuals. But, from want of assistance at home to protect it, and the embargo laid on American goods, which inundated Ireland with English manufactures, the trade has declined, and the cotton manufacture is now almost altogether confined to the county of Antrim. Through the early part of the present century, it was carried on to a considerable extent in Drogheda, Collon, Strafford, Mountmellick, Limerick, and Bandon. Belfast was, however, the place where most skill and capital were expended; as the trade increased there, it declined in other parts of the kingdom; and, though large manufactories have formerly been established at Clonmel, Portland, and Limerick, it may for all practical purposes be considered as extinct in the other parts of Ireland.

No returns have been given since the year 1825, when the total number of pounds of cotton wool imported into Ireland was 4,065,930; and of cotton yarn imported thither from Great Britain in the same year, 41,953,156.

Wherever the linen trade is in operation, the people have constant employment, in consequence of being able to fall back upon their looms when agricultural work is not in demand. They may be said, in common years, to enjoy a competency; that is, a sufficiency of food, raiment, and fuel. But in the western parts of Ulster, as, for example, the mountainous districts of Tyrone, Donegal, and Derry, where the linen manufacture does not exist to any extent, the labouring classes are not much better off than in the three other provinces. However, speaking of Ulster generally, it may be said the lower classes have more self-respect, more industry, more desire for advancement in life, than in other parts of Ireland. In fact, they are a better educated, and therefore more improving people. As may be expected, their taste for comfort operates in the economy of their houses and farms; and, except in the mountainous districts above alluded to, where old habits still maintain their ground, the Ulster peasantry may be considered as a respectable class in society. The average rent of arable land is from £2 to £3 per acre, usually rising in the immediate neighbourhood of towns to £5 or £6. The wages in Ulster vary from 6d. to 9d. a-day in winter, and in summer from 10d. to 1s. a-day, without diet. The food of the peasantry is chiefly potatoes, oatmeal porridge, oaten bread, milk, and fish, which those who live near the sea vary with that species of sea-weed called the edible *alga*.

The salt-water fisheries of Ireland cannot be said to have ever thriven. Under the former system of the Irish Parliament, of giving bounties, large sums were at different times voted for their encouragement; but by this there was no real strength given, and on the withdrawal of these bounties, things fell below their natural level, and the sea-fisheries became altogether inefficient for any purpose but that of supplying the localities surrounding the fisherman's dwelling. The fishery laws are now enforced with regard to both the sea and river fishing, and therefore there is reason to believe that this branch of industry is on the increase, and, if properly managed, will become one of the chief means of benefiting the island. The river fisheries, though less productive than under better management they might have been, yet form in several parts of Ulster a lucrative source of property. The lakes and rivers abound with trout, pike, perch, eels, and char, and on the Bann, the Foyle, and the Ballyshannon in Donegal, are established very successful salmon fisheries. Formerly, whales were not unfrequently, and still are, though but seldom, taken at the coast fisheries in this province. The salmon-fisheries of the Foyle and the Bann were early celebrated. In Phillips's MS., they are stated to have been let from 1609 to 1612, at £666, 13s. 4d. a year, for three years at £800, for eleven years at £1060, and for twelve years, ending at Easter 1639, at £800. The right of fishing the river Foyle, so far as Lifford, is vested in the Irish Society by the charter of Londonderry, granted by James I. in 1613. The increase of the quantity of fish taken since the introduction of stake-nets, is very considerable. The salmon for exportation to London and to Liverpool are packed with ice in boxes, 15 salmon, weighing together about 90 lbs., being put into each case. In a report made to Sir William Petty about 1682, it is stated that the fishing for salmon in the Bann river, and so in all the salmon fisheries, begins with the 1st of May and ends on the last of July. But by the present law, the season now begins the 1st of February and ends on the 1st of September, seven months being open and five close. The Bann fishery has of late years been much neglected; but, under the spirited and judicious management of Charles Atkinson, Esq., it has been much improved during the last year.

Chief Towns.

The chief towns in Ulster are *Belfast* and *Antrim*, in the county of Antrim; *Londonderry* or *Derry*, and *Coleraine*, in the county of Londonderry; *Donegal*, in the county of the same name; *Strabane*, in Tyrone; *Armagh*, in Armagh; and *Newry*, *Lisburn*, and *Downpatrick*, in the counties of Antrim or Down. Without reference to counties, Belfast, Lisburn, Newry, Armagh, and some places of smaller note, may be said to form a cluster of towns chiefly devoted to the linen manufacture, and all occupied by a population who, for generations, have been noted for their industry and peaceful habits.

Belfast is esteemed the principal town and sea-port in this province of Ireland. It is advantageously situated on the west side of the Lagan, where that river swells into an estuary called the Bay of Belfast; distance from Dublin 85 miles. The ground on which the town stands is flat, while the beautiful and fertile environs on the western side of the vale are bounded by a picturesque range of mountains. Within the town, the opposite shore of the Lagan is reached by a long stone bridge, which also forms the egress from Belfast towards Donaghadee. Although this portion of Ireland is inhabited chiefly by Scotch, or their descendants, Belfast, like Dublin, is essentially an English town in external aspect, being built of brick, and having throughout a neat and regular appearance, with many handsome shops. The prosperity of Belfast is dated from the revolution of 1688, when religious and political tranquillity settled upon that part of Ireland. Belfast is in Ireland what Glasgow is to Scotland and Liverpool to England. In manufactures, it is now the great depôt of the linen business, and the seat of the cotton trade, having within itself all the various branches necessary for producing and finishing these fabrics, from the finest cambric to the coarsest canvas. There are in Belfast and its suburbs fifteen steam power mills, for the spinning of linen yarns. Among

these, the factory of Mulholland and Company, employing 800 persons, spins 720 tons of flax annually, the yarn of which is worth £80,000. The hand-spun yarn sold on commission in the linen-hall (a cluster of buildings devoted to the use of linen factors), produces about £100,000 a year. The cotton trade is declining, several of the mills being employed in spinning flax; and there are now only six cotton-mills in the town. There are also extensive corn-mills, breweries, distilleries, and tan-yards, with manufactories of machinery, cordage, glass, iron, soap, candles, tobacco, &c., for home use and exportation. In commerce, its exports and imports are extensive; the amount of duties paid at the custom-house of late years averaging nearly £400,000. The number of vessels lately belonging to the port was 293, the aggregate burden of which was 32,585 tons. Latterly, great improvements have been effected for the accommodation of the shipping, by deepening and contracting the harbour, and furnishing handsome and substantial quays, wharfs, and docks. The port usually exhibits a busy scene of industry, by the daily sailing and arrival of ships and steam-vessels. Ten steamers sail regularly—four to Glasgow, three to Liverpool, two to London, and one to Dublin. In the retail trade, the numerous branches are carried on in a spirited and tradesman-like manner; and the various markets for the sale of the rural produce, which is brought in large quantities to town, are well conducted; in a word, the whole system of trade and industry is on an efficient scale, and equals that of any town of similar size in England or Scotland. The prosperity of the town is likely to be augmented by a railway lately opened, which is designed to proceed to Armagh.*

Belfast abounds in Presbyterian and other Dissenters. The Episcopal places of worship are only two (some authorities say three) in number; but there are ten Presbyterian meeting-houses; there are also two meeting-houses of Independents; the Methodists, four; the Society of Friends, one; and the Roman Catholics, two. The town possesses some excellent charitable and humane institutions: the principal are—a poor-house for the aged and infirm, a house of industry, a lunatic asylum, an institution for the blind and for deaf mutes. This institution is on the same plan as that of Liverpool. The blind are employed in weaving and basket-making, and lately, by the introduction of raised letters, they have been instructed in reading. In 1824, there were in the town and parish sixty-three schools of all kinds, at which 2152 males and 1666 females were educated, exclusive of the Royal Academical Institution, which in 1825 contained 462 boys in its various classes. This institution originated in 1807, in a voluntary subscription of the inhabitants, by whom a fund was raised of above £25,000, to which the late Marquis of Hastings added £5000 for its erection and the endowment of its teachers and professors. It consists of two departments, one elementary, the other for the higher branches of science and literature. This establishment is directed by a president, four vice-presidents, twenty managers, and eight visiters, chosen by the proprietory. The chairs in the collegiate department are eight, embracing Divinity, Moral and Natural Philosophy, Logic, Mathematics, Greek, Latin, Hebrew, and a lectureship on Irish. The object of this academy was to give cheap home education to those who had heretofore frequented the Scottish colleges. The Synod of Ulster receives the general certificate of this institution as a qualification for ordination, and it may be now considered the great seminary for the Presbyterian Church in Ireland. The Belfast Academy had been founded some time previously by private subscription.

Of literary societies, Belfast possesses the Society for Promoting Knowledge, founded 1786; the Literary Society for Improvement in Literature, Science, and Antiquities, founded 1801; and the Natural History Society, founded 1821. The town has lately received the valuable addition of a botanic garden, on a large scale, and laid out in an exceedingly tasteful manner. It was established, and is wholly supported by the inhabitants of Belfast, and affords a pleasing proof of their spirit and liberality. The population in 1831 was 53,287, but this number is now considerably increased.

Londonderry ranks next to Belfast. Besides being a sea-port of considerable importance, it is the seat of a bishop's see. It is situated on the west bank of the Foyle, a few miles above the point where that river spreads into the harbour of Loch Foyle, and is distant 146 miles from Dublin. The original town built by Sir Henry Dowera about 1603–4, was burned by Sir Cahir O'Dogherty in 1608; and the present city may be considered as deriving its origin from the London plantation, which was the immediate result of that catastrophe. The walls of Derry are described by Pynnar as "excellently made, and neatly wrought; the circuit thereof about 24 perches, and in every place the wall being 24 feet high and 6 in thickness;" and, after a lapse of more than two centuries, these fortifications retain their original form and character. The north-west bastion was demolished in 1824, to make room for a market; and in 1826 the central western bastion was modified for the reception of Walker's Testimonial; but the guns used during the celebrated siege are still preserved in their original places. The total number of cannon remaining in the city and suburbs is about fifty; and in the court-house yard stands *Roaring Meg*, so called from the loudness of her report during the siege. This cannon is 4 feet 6 inches round at the thickest part, and 11 feet long, and is thus inscribed—"Fishmongers, London, 1642."

The chief of the ecclesiastical buildings is the Cathedral. For nearly twenty years after its plantation, Derry was without a proper place of worship, part of the ruined church of Saint Augustine being employed for that purpose. At length a royal commission of inquiry was appointed, which, in 1628, reported that the corporation of London had begun to build a fair church in Derry, and in 1633 its erection was completed. This event is recorded in a tablet, which was originally placed over the door of the porch of the old cathedral, but is now over that of the belfry, bearing the following couplet:—

"If stones could speak, then London's praise should sound,
Who built this church and city from the ground.—A. D. 1633."

The other principal places of worship are—a chapel of ease, a free church, two Presbyterian meeting-houses, a Wesleyan chapel, a Primitive Wesleyan Methodist chapel, also Reformed Presbyterian, Seceding, and Independent chapels, and a Roman Catholic chapel, which can accommodate 2000 persons. The principal buildings in the city are the Bishop's Palace, the Public Library and News-room, the Lunatic Asylum, the Jail, and Corporation Hall. Of its various manufactories, the chief are two great distilleries, and two corn-mills, one worked by a steam-engine of eighteen, the other by one of twenty horse-power. The public schools in Derry are, the Diocesan, the Parochial, the Presbyterian, the Meeting-house, St. Columb's, the Barracks, the Infant School; and besides these are many others, public and private. There is here a branch of the London Bible Society, the Londonderry Literary Society, and one for promoting religious, moral, and historical knowledge. There are also the Londonderry Farmers' Society and the Mechanics' Institution. The port carries on a considerable traffic, both with respect to imports of foreign and British produce, and exports. The estimated value of the exports of Irish produce is above a million ster

* We have been indebted for a number of these particulars to "The Tourist's Guide to Ireland," a work of great merit, published by Messrs. W. Curry, Jun. and Co., Dublin.

ing per annum. The population of Londonderry in 1831 was 10,130.

The city of *Armagh*, situated in an inland part of the country, is of considerable local importance. It is placed in the midst of a rich and beautiful district, the face of which is singularly varied by detached hills, some of which are more than a thousand feet in height. This character of country stretches from Lough Neagh in the north, to the north-western part of the county of Meath in the south, and is well watered by lakes and streams, and, generally speaking, richly furnished with wood. The city stands on a hill, which is crowned by the old cathedral, around which the town has gradually arisen. Within these few years, several handsome buildings have been erected, with cut stone fronts—the Court-house, the Jail, the Presbyterian Church, Primate Stewart's Free School, founded and liberally endowed by him, and well carried on; the National School, and the Savings' Bank. The Cathedral has been re-edified within these five years, at an expense exceeding £30,000, in the pointed Gothic style, for the most part in very good taste; the organ is a remarkably fine one, and the choir excellent. The roads, in all directions, are admirable; and in the laying out of the new ones, they are carried round instead of over the hills. There is water-carriage from both Belfast and Newry by lake and canal, to within four miles of the city; the streets have flagged footways, and are well lighted with gas. About forty years since, the population was only 1000. It now amounts to 13,000. The Archbishop of Armagh, Primate of all Ireland, resides close to the town, as do also a large number of clergymen attached to the Cathedral, as well as many respectable gentry. Near Armagh stands the Observatory, built and endowed by Primate Robinson, whose munificence greatly contributed to the advance of science and improvement of the whole diocese. This noble institution is at present conducted by the Rev. Dr. Robinson, Professor of Astronomy.

CONNAUGHT.

CONNAUGHT, the smallest of the four provinces, contains but five counties, those of *Leitrim*, *Roscommon*, *Mayo*, *Sligo*, and *Galway*. There are in this province large tracts of mountainous and sterile land, especially in the western parts of the counties of Galway and Mayo. The peninsula formed by the western part of the first of these counties is named *Connemara*, and is famed for its scenery, which somewhat resembles that of Argyllshire. It may be described as a vast tract of mingled bog, lake, rocky moorland, and mountain, bounded and partially penetrated by deep inlets of the sea, resembling the fiords of Norway. The principal lake is Lough Corrib, which is twenty miles long, full of islands, and surrounded by an extensive rocky desert, bearing no small resemblance to those of Arabia. Between this lake and the western extremity of Connemara, there is a range of tall swelling green hills, called the Twelve Pins of Bunabola, and to the north of these is an estuary famed for its wild scenery, named the Killery, many miles in length, and connected with the Atlantic by a passage only thirty feet wide. Connemara contains a small, scattered, and primitive population, unusually full of superstitious and old feudal feelings. Besides Clifden, a modern fishing-village on the west coast, there is scarcely any such seat of population in the district. There are, however, a few homely inns for the accommodation of the numerous tourists who flock thither in summer.

From the high grounds near Westport, is obtained a view of Clew Bay, a magnificent sheet of almost enclosed water, full of islands, and bounded by lofty mountains, among which the most conspicuous are Croagh, Patrick, and Nephin. The islands of Clare and Achill bound the scene towards the west. In some states of the weather, and particularly when a summer sun is calmly descending on Clare, the view of Clew Bay is one of extraordinary beauty. The islands are said by the common people to be as numerous as the days in a year, but in reality are only about a hundred. Croagh Patrick is regarded with superstitious feelings by the peasantry, as the spot where their tutelary saint was accustomed to preach.

Amidst the great tracts of wild ground in Connaught, there are a few other spots of an unusually attractive character. The scenery round Lough Allen, out of which the Shannon flows, is extremely pretty, as is also that near Boyle, at the foot of the Curlew Mountains. At Lough Gill, near Sligo, a lake bearing a strong resemblance to the upper lake of Killarney, and the little bay of Ardnaglass, into which falls the cataract of Ballysedare, are scenes of peculiar beauty. Much of the surface of Galway is flat, showing, for twenty miles together, a succession of narrow limestone rocks, like parapet walls of three feet high, placed in parallels to each other, at distances of from three to ten feet; the intermediate spaces, though apparently but a waste of rock and stone, supply the finest sheep pasture in the kingdom.

The great central limestone district of Ireland occupies the southern portion of this province, which, to the eye, forms an exception to the general character of limestone countries, appearing so exceedingly barren, that, in passing over tracts of Galway and Mayo, the traveller almost doubts whether he is not journeying over a great cemetery covered with tombstones, rather than over places where the sheep could find pasture or the peasant plant potatoes. There are, however, some exceptions to this prevailing sterility, for nowhere are finer sheep-walks found than in some parts even of the southern counties of Connaught. The tillage of this province is principally confined to oats and potatoes, as best suited to the shallow mountain bog-soil, which so largely prevails in the western baronies. The extreme moisture of the climate is so inimical to the growth of wheat, that, except in a few parts of Galway, Connaught cannot be said to grow its own bread corn. There is a great export of oats and potatoes from the ports of Galway, Westport, and Sligo. With regard to husbandry, though it certainly is improving, it is yet much inferior to that of the other provinces. The landholders pride themselves on the breed of long-woolled sheep, their great source of wealth; and the celebrated Fair of Ballinasloe, where from 80,000 to 100,000 are usually sold, year after year exhibits an improvement in this branch of rural economy. Horned cattle, and horses, especially hunters, are also bred extensively in Galway. What has been said of Munster applies in a still more aggravated degree to Connaught. The property of an absentee landlord is usually divided into portions ruinously small; and if the proprietors do not quickly interfere, deplorable consequences must result from the subdivision system. The grazing farms are let in large portions, which it is the policy of the farmer not to diminish. Rents vary from £1 to £1, 10s. an acre, except in the vicinity of towns, where they rise to £2 and £3; and wages are from 10d. to 1s. a day in summer, and from 8d. to 10d. in winter.

There have been many attempts to introduce the linen manufacture into Connaught, and markets for its sale were established in Sligo, Castlebar, Westport, and Galway; but though it thrives to an extent sufficient to supply the rural population, there is reason to believe that little if any linen is exported from the province. There is, from the ports above mentioned, a pretty large export of oats, whisky, and potatoes.

The peasantry in Connaught are as poor as poverty can be without amounting to destitution; and, except in the mountain districts, their situation is daily becoming worse—so much so, that poverty, in times of scarcity, which on an average occur about once in seven years,

increases to destitution, and appeals to the richer members of the empire to save the labouring classes from actual starvation, become unavoidable. The food of those who are the best off is generally dry potatoes, with occasionally a herring or an egg. In Connaught, the indigent peasant is reduced to a state of greater poverty, by grasping at the temporary relief afforded by the system called by the Irish name of *gambeen* (exchange), of which the principle is to furnish provisions to the poor, allowing time for payment, but generally charging an exorbitant interest. This system has led to the most deplorable results.

There is a good salmon-fishery near the town of Galway, and one for cod, hask, and haddock, which, from the poverty of those engaged in it, which prevents them from providing sufficient tackling for their boats, is less productive than it might be. In some years the sun-fish, or basking-shark, are abundant off the shores of Galway, and much excellent oil is produced; but this fish is so capricious, that the fishery cannot be looked to with any certainty. The salmon of Ballinahinch are regularly sealed up in tin cases by the gentleman who farms this fishery from Mr. Martin, the principal proprietor of the country. There is a very productive salmon-fishery below the thriving town of Ballina, on the river Moy, from which large quantities of salmon are sent to the London market.

Chief Towns.

Galway, reckoned the capital of the west, and in point of population the fifth town in the kingdom, is situated in a valley lying between the bay which bears its name and Lough Corrib. The town is of considerable antiquity, and consists of streets and lanes huddled together without any regard to comfort or convenience. The whole partakes of the appearance of a Spanish town, the result probably of its early intercourse with Spain; and a small open space near the quay retains the name of *Spanish Parade*. The principal ecclesiastical buildings are the Parish Church of St. Nicholas, founded in 1320, a Presbyterian meeting-house, and the Roman Catholic chapel. The Franciscans, Augustines, and Dominicans, have monasteries here. The chief public buildings are—the County Court House, a handsome cut-stone edifice, erected in 1815, with a portico of four Doric columns; and the Tholsel, built during the civil wars of 1641. The schools in Galway are mostly under the superintendence of the Roman Catholic religious orders. There is also one on the foundation of Erasmus Smith, one belonging to the National Board, and about sixteen parish schools. Galway possesses a house of industry, an asylum for widows and orphans, a Protestant poorhouse, and a Magdalen asylum, which is supported by two benevolent Roman Catholic ladies.

The chief manufacture of Galway is flour. There are a bleach-mill and green on one of the islands, an extensive paper-mill, and several breweries and distilleries in the town. The exports consist principally of grain, kelp, marble, wool, and provisions; the imports, of timber, wine, coal, salt, hemp, tallow, and iron. In 1835, the vessels entered inwards numbered 135, of an aggregate burden of 12,915 tons; while the vessels cleared outwards amounted to 145, with a tonnage of 15,531. In 1840, a splendid dock was opened, from which great expectations are formed of the increase of trade. A steamer in this bay is highly necessary, for towing out vessels in adverse winds. In 1831, the population of Galway was 33,120.

Across the country in a northern direction, and also situated at the head of a bay bearing its name, stands *Sligo*, a town of a much smaller population than Galway, but more important as respects its commerce. It has carried on for several years a considerable trade, both export and import, and is still increasing, notwithstanding the bad state of its harbour. The exports are wholly limited to agricultural produce. The retail trade is extensive, articles of every description in demand being supplied to a large and populous district. The streets in the older part of the town are narrow, dirty, and ill-paved, and badly suited to the bustle of an export trade. But convenient markets have been erected, and the extension of the town by regularly built wide streets, is expected to remedy the inconvenience and irregularity of the older parts. Some good public buildings embellish the prominent points in and about the town, and the river Garwogue, which bears the surplus waters of Lough Gill to the bay, and turns several large flour-mills in its course, is a fine feature in the scene. The suburbs are beautiful and picturesque. In 1831, the population was 15,152.

TRADE BETWEEN GREAT BRITAIN AND IRELAND.

The trade and general intercourse between Great Britain and Ireland have been greatly increased since the Union in 1800, and more particularly since the establishment of steam navigation on a large scale. The following statements on this branch of our subject are given by Mr. Porter in his lately published work, "The Progress of the Nation."

The value of produce and merchandise that have been the objects of trade between Great Britain and Ireland, in various years since the Union, has been stated in papers laid before Parliament, as follows:—

	Imports into Ireland from Great Britain.	Exports from Ireland to Great Britain.
1801, - - - -	£3,270,350	£3,537,725
1805, - - - -	4.007,717	4,288,167
1809, - - - -	5.316,557	4,588,305
1813, - - - -	6,746,353	5,410,326
1817, - - - -	4.722,766	5,696,612
1821, - - - -	5.338,898	7,117,452
1825, - - - -	7,948,936	8,531,355

No account of this trade can be given for any year subsequent to 1825, the commercial intercourse between Great Britain and Ireland having at the end of that year been assimilated by law to the coasting traffic carried on between the different ports of England; and, with the exception of the single article of grain (as to which it was considered desirable by the legislature to continue the record), we have now no official register of the quantity or value of goods or produce received from or sent to Ireland. That this traffic has greatly increased in all its branches there can be no doubt; and this increase may partly be attributed to the abolition of the restrictions that existed up to 1825, but probably still more to the employment of steam-vessels upon an extensive scale. To show the extent to which the traffic has been carried by this means, a statement was furnished to a committee of the House of Commons by the manager of a company trading with steam-vessels between Ireland and Liverpool, of the quantity and value of agricultural produce imported into that one port from Ireland in 1831 and 1832. From this statement it appears that the annual value of the trade was about four millions and a half sterling, which was in great part made up of articles that could not have been so profitably brought to England by any previously existing mode of conveyance—such as live cattle, horses, sheep, and pigs; the value of which amounted in 1831 to £1,760,000, and in 1832 to £1,430,000. During the same two years the value of Irish agricultural produce brought to the port of Bristol averaged about one million sterling. The whole number of cattle, horses, sheep, and pigs, sent from Ireland to the various ports of England and Scotland, in different years from 1801 to 1825, was as follows:—

	1801.	1805.	1809.	1813.	1817.	1821.	1825.
Cattle, -	31,543	21,809	17,917	9,973	45,301	26,725	63,619
Horses,	669	4,114	3,264	3,904	848	2,392	3,130
Sheep, -	2,879	10,038	7,572	7,509	29,460	25,310	72,161
Pigs, - -	1,908	6,383	4,719	14,521	24,193	104,501	85,919

The numbers sent to Liverpool and Bristol alone, in 1831 and 1832, were—

	Liverpool.		Bristol.	
	1831.	1832.	1831.	1832.
Cattle, - - -	91,911	71,318	6,078	4,077
Horses and Mules,	539	708	159	190
Sheep, - - -	156,427	98,337	11,640	4,446
Pigs, - - -	150,001	149,090	84,107	85,619

The statement above mentioned of the imports into Liverpool occasioned considerable surprise at the time it was made, from the greatness of its amount; but it would appear that this branch of trade has since gone on increasing in a most extraordinary degree, as will be seen from the following account of the number and value of live animals brought from Ireland to Liverpool in the year 1837:—

94,710 Black Cattle, at	£16	each, - - -	£1,365,360
316 Calves,	45s.	" - - - -	711
225,050 Sheep,	40s.	" - - - -	450,100
24,669 Lambs,	18s.	" - - - -	22,202
595,422 Pigs,	50s.	" - - - -	1,488,555
2,414 Horses,	£20	" - - - -	68,280
319 Mules,	£8	" - - - -	2,552
Total value,		- - - -	£3,397,760

The average value here assigned to the several kinds of animals, is given on the authority of an intelligent gentleman resident at Liverpool, and who is practically acquainted with the trade.

The value in money, of one seemingly unimportant article, eggs, taken in the course of the year to the above two ports from Ireland, amounts to at least £100,000. The progress of this trade affords a curious illustration of the advantage of commercial facilities in stimulating production and equalizing prices. Before the establishment of steam-vessels, the market at Cork was most irregularly supplied with eggs from the surrounding district; at certain seasons they were exceedingly abundant and cheap, but these seasons were sure to be followed by periods of scarcity and high prices, and at times it is said to have been difficult to purchase eggs at any price in the market. At the first opening of the improved channel for conveyance to England, the residents at Cork had to complain of the constant high price of this and other articles of farm-produce; but as a more extensive market was now permanently open to them, the farmers gave their attention to the rearing and keeping of poultry, and, at the present time, eggs are procurable at all seasons in the market at Cork, not, it is true, at the extremely low rate at which they could formerly be sometimes bought, but still at much less than the average price of the year: a like result has followed the introduction of this great improvement in regard to the supply and cost of various other articles of produce. In the apparently unimportant article feathers, it may be stated, on the respectable authority above quoted, that the yearly importation into England from Ireland reaches the amount of £500,000.

When, some years ago, it was determined to cease keeping any official record of the commercial intercourse between Great Britain and Ireland, an exception was made as regards grain and flour, that trade being of great personal interest to our legislators. The following statement exhibits the quantities of those kinds of produce sent to Britain from Ireland in each year from 1815 to 1836:—

Years.	Wheat and Wheat Flour.	Barley and Barley Meal.	Oats and Oatmeal.	Total, including Rye, Beans, Peas, &c.
	Qrs.	Qrs.	Qrs.	Qrs.
1815	139,544	27,108	567,537	931,192
1816	121,631	62,254	683,714	873,865
1817	59,025	26,766	611,117	699,809
1818	108,230	25,387	1,069,385	1,207,851
1819	154,031	20,311	799,613	967,951
1820	404,747	87,065	916,250	1,417,120
1821	569,700	82,894	1,162,949	1,823,816
1822	462,004	29,532	589,337	1,083,089
1823	400,069	19,274	1,102,427	1,528,153
1824	356,408	45,572	1,225,085	1,634,094
1825	396,018	105,082	1,629,856	2,203,902
1826	314,851	64,885	1,303,734	1,692,180
1827	405,955	67,791	1,343,207	1,829,743
1828	652,584	84,204	2,075,631	2,826,135
1829	519,493	97,140	1,673,628	2,305,806
1830	529,717	189,745	1,471,252	2,217,729
1831	557,520	185,409	1,655,934	2,417,643
1832	572,586	123,068	1,890,321	2,605,734
1833	644,201	107,519	1,762,519	2,736,281
1834	779,504	217,568	1,713,971	2,733,046
1835	661,773	156,176	1,813,161	2,659,345
1836	598,756	182,887	2,126,693	2,929,329

In the absence of all further custom-house records, the following table of the number and tonnage of vessels in which the trading intercourse with Ireland has been carried on during each year of the present century, will afford a pretty correct view of its amount and progress. If we compare the tonnage employed in 1801 with that of 1836, we shall find that they bear the proportion of 257 to 100, showing an increase of 157 per cent. It will further be seen that this increase has been much more rapid during the last ten years in which steam-vessels have been so much brought into use, than it was in the preceding years of the series. Up to 1826, the increase from 1801 was no more than 62 per cent., showing a mean annual increase of 2¾ per cent.; whereas, in the ten years following 1826, the increase has been 95 per cent., or 9½ per cent. annually.

Years.	Inwards.		Outwards.	
	Ships.	Tons.	Ships.	Tons.
1801	5,300	456,026	6,816	582,033
1802	5,820	461,328	5,540	449,350
1803	5,796	504,884	5,656	502,279
1804	5,643	490,456	6,149	557,279
1805	6,306	566,790	6,875	598,720
1806	6,907	578,297	7,032	586,728
1807	No returns can be procured for this year.			
1808	8,477	768,264	7,566	696,473
1809	7,041	600,898	7,011	589,587
1810	8,403	713,087	9,121	763,488
1811	9,014	789,007	8,216	709,736
1812	10,812	925,736	10,053	867,342
1813	8,569	718,851	9,096	773,286
1814	7,562	613,898	8,719	715,171
1815	8,462	686,333	9,602	776,313
1816	7,575	621,273	8,861	721,772
1817	9,136	776,547	9,530	792,770
1818	7,969	644,996	8,963	763,922
1819	8,975	699,895	9,751	795,495
1820	9,229	783,750	8,451	734,716
1821	9,440	819,648	9,266	801,007
1822	9,562	832,927	9,035	823,114
1823	9,382	786,637	9,037	814,383
1824	7,534	615,396	10,089	905,449
1825	8,922	741,189	10,981	922,355
1826	6,388	632,972	11,509	1,055,870
1827	7,411	737,752	11,083	1,044,093
1828	8,790	923,505	12,339	1,167,980
1829	8,922	906,158	13,478	1,286,168
1830	8,455	880,965	13,144	1,245,647
1831	9,029	921,128	13,159	1,246,742
1832	9,705	1,026,613	14,694	1,417,633
1833	9,479	1,041,882	14,227	1,378,558
1834	10,026	1,100,389	14,560	1,440,617
1835	10,110	1,138,147	14,608	1,473,238
1836	9,920	1,179,092	14,725	1,490,788
1837	10,299	1,202,104	10,347	1,585,694

EMIGRATION TO CANADA, AND OTHER BRITISH AMERICAN POSSESSIONS.

From one cause or another, emigration is a subject of considerable interest to the British public, and for some years has been practised upon a large scale. It is not necessary here to discuss these causes, but it may be allowable to present an account of the various countries chiefly resorted to by British emigrants, such as may be useful to persons contemplating a change of country, and at the same time convey to those who remain some knowledge of the regions to which so many of their friends and fellow-countrymen have removed. In drawing up these accounts, we are animated by an extreme desire to be correct and faithful, so that no one shall be unduly persuaded or dissuaded with respect to so important a step as that of emigration. If, therefore, any error should find its way into our pages, it must be attributed to unfaithfulness in the original reporters, or to our imperfect handling of the subject, and to no other cause.

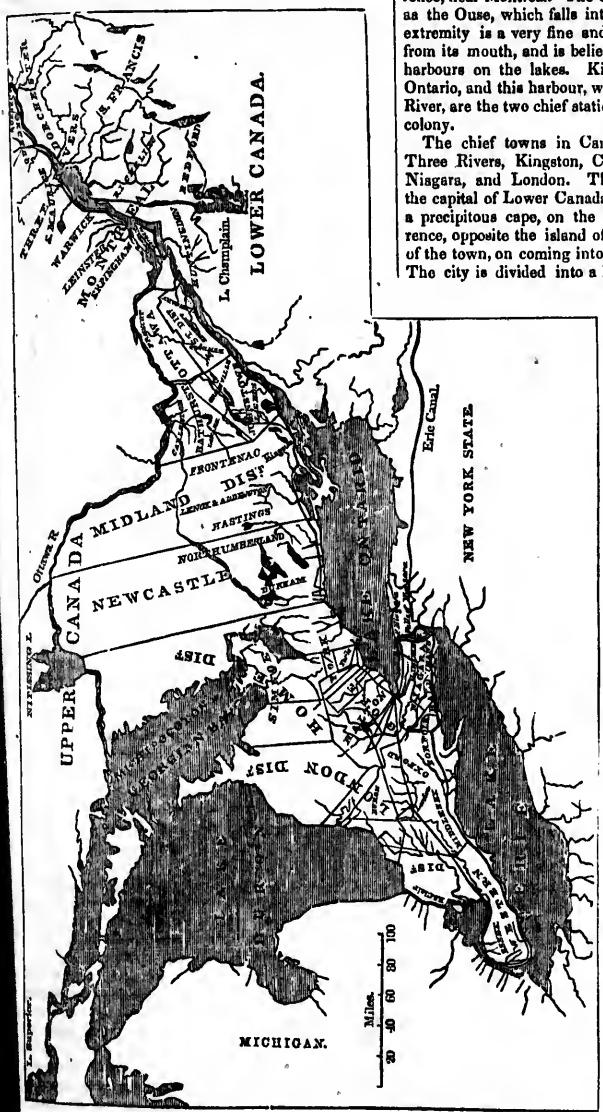
There are three regions of the earth to which the attention of emigrants is chiefly directed, namely, Canada and the other British possessions in North America; the United States, which many prefer, and which hold out similar advantages; and the British colonies in Australia, Van Diemen's Land, and New Zealand. At present our attention will be confined to Canada and the other British American possessions.

CANADA.—GENERAL DESCRIPTION.

North America, of which Canada is a part, lies at the distance of 3000 miles west from Great Britain, on the opposite shore of the Atlantic Ocean. This vast continent is much larger than Europe, measuring 4376 miles in length from north to south, and 3000 miles across from east to west. As yet, only a portion of the territory, measuring a few hundred miles back from the coast of the Atlantic, has been settled by people of European descent. Excepting in a few districts, the remainder of the continent is possessed only by a thin and scattered population of Aborigines. The southern and tropical part of North America is composed of the republics of Guatemala and Mexico; the most temperate portion (from the 30th parallel of latitude to about the 43d) forms the republic of the United States. The more northerly part, with some islands, is in the possession of Great Britain, and comprehends the provinces of Canada, New Brunswick, Nova Scotia, Newfoundland, Cape Breton, St. John's or Prince Edward Island, &c. The line of division betwixt the British possessions and the United States is either the River St. Lawrence and the lakes from whence it proceeds, or an ideal and mutually arranged boundary. Canada is bounded on the east by the Gulf of St. Lawrence and Labrador; on the north by the territories of Hudson's Bay; on the west by the Pacific Ocean; on the south by Indian countries, parts of the United States, and New Brunswick. Canada, until a recent period, was divided into two provinces, the Upper and Lower, each of which had its own local government; but by a recent act of the Imperial Parliament, the two provinces are united under one general Legislative Council and House of Assembly, two bodies respectively resembling the Houses of Peers and Commons in the mother country, and whose measures require the consent of the governor, as the acts of the home Parliament require that of the sovereign. The affairs of this, as of all other colonies, are subject to an ultimate control vested immediately in a colonial minister, but finally in the British legislature. In Lower or Eastern Canada, the greater part of the population is of French descent (this having originally been a French colony); the laws resemble those of France, and the French language is generally spoken. Upper or Western Canada lies to the west and south-west of the lower province. Its inhabitants are of British descent, and a very great number of them are from Scotland, both Lowlands and Highlands. The English law and church are here established; but there is the most perfect liberty of conscience, and as great a security of life and property as even in Scotland or England. Western Canada is divided into districts, counties, ridings, townships, special tracts, and allotments, together with blocks of land reserved for the clergy and the crown, and lands appropriated to the Indians. A district contains one, two, or three counties, and each county contains from four to thirty townships. There are 18 districts, 26 counties, and 6 ridings, comprising together 273 townships. The line of division betwixt Western and Eastern Canada is in one part the Ottawa or Grand River. Nearly all the other lines of division in the provinces are straight; without regard to physical distinction, such as hills and rivers; and this peculiarity is common over the whole of North America. The entire area of Upper Canada has been estimated at 64,000,000 acres. Of this extent of territory, the portion laid out in townships, and open for settlement, amounts to nearly 17,000,000 acres, the size of each township averaging 61,600 acres. Deducting the quantities granted to different classes of settlers, and otherwise disposed of by the crown, there yet remains within the townships, at the disposal of government, about 3,000,000 acres. This tract of country, chiefly bordering the north shore of the River St. Lawrence, and of the Lakes Ontario, Erie, and St. Clair, and of the rivers or straits communicating between these lakes up to Lake Huron, a distance in all little short of 700 miles, and stretching northward from the water to a depth varying from 50 to 80 miles, is composed of a soil which, for productive richness, variety, and applicability to the highest purposes of agriculture, may challenge competition with the choicest tracts of land in the New World.

Western Canada is chiefly a flat country, and is for the greater part covered with timber, but possesses a number of chains or ridges of high lands, running in different directions, and separating the sources and channels of innumerable rivers and brooks. The higher and less districts are called Table Lands. The grand feature of the country is, its water-courses. By looking at the map, it will be perceived that there is a series of large lakes, communicating with each other; these are unequalled by any inland sheets of water in the world, and are entitled to the appellation of fresh-water seas, for they are not only of great extent, but are liable to be affected by storms like the ocean itself. The uppermost called Lake Superior, is 381 miles long, and 161 broad; Huron, 218 miles long, and from 60 to 180 broad; Erie, 231 miles long, and about 70 in breadth; Ontario, 171 miles in length, and 60 in breadth. The waters of Lake Erie, on issuing from its lower extremity, form a river above 30 miles in length, and varying from three miles to a quarter of a mile in breadth, which in its course precipitated over a precipice to a depth of 165 feet,

making the famed cataract or Falls of Niagara. The river is, at the distance of a few miles below, received by Lake Ontario, whence issues the River St. Lawrence, one of the largest streams in the world, and which, after a course of above 2000 miles from its head waters above Lake Superior, falls into the Atlantic. This majestic river, which is 90 miles wide at its mouth, and for some distance inwards, varying from 60 to 24 miles, is navigable for ships of the line for 400 miles from the ocean. In its upper parts above Montreal, which, next to Quebec, is the chief port for ocean vessels, its navigation is impeded by *rapids*, or the rushing of the stream down an inclined plane. But these impediments are obviated by means of canals recently cut; wherefore there is now a continued water communication for vessels from the Atlantic up into the interior, so far as the foot of Lake Superior, where a series of rapids impede the entrance into that lake, and only requiring a short canal of about half a mile to complete the vast chain of inland navigation. The Welland Canal, a magnificent undertaking, connects Lakes Erie and Ontario, and affords a passage for vessels of large size. Lake Erie is also connected by a canal with the Hudson, a river of the United States which also falls into the Atlantic. The River Ottawa is next to the St. Lawrence in point of size, and is tributary to it. It falls into the north side of the St. Lawrence, near Montreal. The Grand River, formerly known as the Ouse, which falls into Lake Erie near its lower extremity is a very fine and deep stream for some miles from its mouth, and is believed to afford one of the best harbours on the lakes. Kingston, at the foot of Lake Ontario, and this harbour, within the mouth of the Grand River, are the two chief stations for the naval forces of the colony.



The chief towns in Canada are Quebec, Montreal Three Rivers, Kingston, Cobourg, Toronto, Hamilton, Niagara, and London. The city of Quebec, formerly the capital of Lower Canada, stands on the extremity of a precipitous cape, on the north bank of the St. Lawrence, opposite the island of Orleans. The appearance of the town, on coming into view, is particularly striking. The city is divided into a lower and upper town; the lower being of ancient date, and adopted as the seat of commerce, and the upper being the residence of the higher and more affluent classes. There are a number of fine public edifices; among the rest, the old Parliament House of the province, a stately building of hown stone; the Roman Catholic and Protestant cathedrals; the barracks, hospitals; the Quebec bank and a handsome monumen to Wolfe and Montcalm The institutions are, in many instances, of French character, and the language of the inhabitants is French and English.

Montreal, now the capital of United Canada, is a city of an entirely different appearance. It is agreeably situated on a beautiful island of the same name in the St. Lawrence, which measures thirty-two miles long by ten and a half broad, and lies at the confluence of the Ottawa River and the St. Lawrence. The island of Montreal is nearly level, and is scarcely excelled in fertility. The city stands on the south side of the island, and is reckoned the first in the province in respect of situations, local advantages, and mildness of climate. The houses in the modern parts of the city are well built, and the streets commodious. There are also

some has some public buildings. The literary and scholastic institutions in Montreal are numerous, and are of great benefit to the province. There is a line of substantial stone wharfs along the bank of the river, in front of the town, where there is deep water. Mr. Macgregor mentions, in his work on British America, that there is much activity observable among all classes connected with trade. "The position of Montreal," says he, "at the head of the ship navigation, and near the confluence of the St. Lawrence with the Ottawa, and its subsequent communication with Upper Canada, the Genessee country, and other parts of the United States, will always constitute it one of the greatest commercial emporiums in America, which must increase in magnitude and importance along with the rapid improvement and increasing population of the upper and surrounding countries. In winter, the trade of Montreal is not suspended like that of Quebec. Hundreds of sledges may be seen coming in from all directions with agricultural produce, and frozen carcasses of beef and pork, firewood, and other articles. Manufactured goods of all kinds are continually selling off in packages by the merchants or the auctioneers to the shopkeepers and country dealers, who again retail them to the townsfolk or country people; and flour, wheat, potatoes, &c., are continually coming in, and filling the stores or warehouses. The markets of Montreal are abundantly supplied at all seasons of the year."

CHARACTER OF DISTRICTS IN CANADA.

The various writers on Canada each recommend particular districts for the settlement of the emigrant; but it is hardly to be expected that persons in this country can make a perfectly judicious choice, a personal inspection of the lands, or at least information near the spot, being in almost every case requisite. The most elaborate details are given by Bouchette, in his large work on British America, regarding the different parts of the province; and as what he mentions may be of use in furnishing emigrants with an idea of the nature of the lands, we take the liberty of offering a few of his observations.

"*The Eastern Section*, including Ottawa, Johnstoun, Midland, and Bathurst districts.—Situated between two broad and navigable rivers, the Ottawa and the St. Lawrence, and centrally traversed in a diagonal course by an extensive and splendid sloop canal, connecting the navigation with the waters of Ontario, this section of country evidently enjoys important geographical and local advantages. Its surface presents, almost unexceptionably, a table-level of moderate elevation, with a very gentle and scarcely-perceptible depression, as it approaches the margin of the magnificent streams by which it is bounded to the northward and south-east. The soil, though sometimes too moist and marshy, is extremely rich and fertile, and chiefly consists of a brown clay and yellow loam. This section is intersected by numerous rivers, remarkable for the multitude of their branches and minor ramifications. There are also a number of good public roads both along the St. Lawrence and Ottawa, and into the interior. Great industry and attention to improvement are displayed upon most of the lands throughout this tract. The town of Kingston, which, next to Toronto, is the largest and most populous of the upper province, is very advantageously seated on the north side of the St. Lawrence, or rather at the eastern extremity of Lake Ontario. The streets are regular and well planned, and the population may be estimated at about 9000. The town has considerable mercantile importance: the harbour is well sheltered and convenient.

"The thriving village of Perth is situated in the township of Drummond, on a branch of the Rideau, and occupies a central position between the Ottawa River and the St. Lawrence, communicating by tolerably good roads with Kingston to the south and Bytown to the northward, at the opposite extremities of the Canal. The first establishment, fostered by government, was made in 1815 by British emigrants, chiefly from Scotland, many of whom are now at the head of excellent farms, possess comfortable habitations, and reap the fruits of their perseverance and industry.

"Ascending along the shores of Lake Chaudiere, the objects of note first presenting themselves are the rising colonies in front of the townships of March and Tarbolton; they are chiefly composed of families of high respectability, possessed in general of adequate means to avail themselves of the advantages that are incident to a newly-opened country. High up, on the bold and abrupt shore of the *Chats*, the Highland chief Macnab has erected a romantic edifice, Kinell Lodge, which he has succeeded, through the most unshaken perseverance, in rendering exceedingly comfortable.

"*The Central Section* of the province (continues the accurate Bouchette) embraces the districts of Home and Newcastle, which occupy a grant of about one hundred and twenty miles upon Lake Ontario, extending from the head of the bay of Quinté westward to the line between Toronto and Trafalgar. Although less populous than the tract of country composing the first part of the division which we have adopted, this portion of the province does not yield to it in fertility, and is equally well watered by numerous lakes, broad and beautiful rivers, and innumerable streams and brooks. The rivers in general abound with excellent fish, and especially salmon, great quantities of which are annually speared in the River Credit, for the supply of the western country. In front of Newcastle district, on the borders of Lake Ontario, the soil consists of a rich black earth; but in the district of Home, the shores of the lake are of an inferior quality. The lands upon Yonge street [roads are frequently called streets in Canada], which connects Toronto with Lake Simcoe, are exceedingly fertile, but so destitute of stones (for building and other purposes), as to create some inconvenience to the settlers. A sandy plain of some extent exists some distance north of Ontario, towards Rice Lake; but, saving this, and probably one or two more comparatively insignificant exceptions, the soil of this tract of country is extremely fertile, well adapted for agriculture, and yields luxuriant crops of wheat, rye, maize or Indian corn, peas, barley, oats, buckwheat, &c. The fronts of all the townships from Kingston to Toronto are, with few exceptions, well settled; roads lead through them, from which, in many places, others branch off to the interior. At intervals, rather distant indeed from each other, there are a few small villages. On the lands that are occupied, great progress has been made in agriculture: the horses, generally speaking, are strong and well-built; and the inhabitants appear to be possessed of all the necessaries, as well as most of the comforts, that a life of industry usually bestows." In this division is the town of Toronto. Our authority next proceeds to notice

The Western Section, which includes Gore, Niagara, London, and Western Districts. "With the aid of a little fancy," says Bouchette, "this tract of country may be shaped into a vast equilateral triangular peninsula, whose base, extending from Fort Erie to Cape Hurd on Lake Huron, measures 216 miles, and whose perpendicular, striking the Detroit River at Amherstburgh, is about 195 miles. It is bounded on the north and west by Lake Huron, River and Lake St. Clair, and Detroit River; south by Lake Erie; and east by Niagara River, Lake Ontario, and the western limits of the district of Home. The surface it exhibits is uniformly level, or slightly undulating, if we except a very few solitary eminences, and those parts of the districts of Gore and Niagara traversed by the ridge of elevated land. The variety of soils, and the diversity of their combinations observable in these four districts, are by no means so

great as might be expected in so extended a region. The whole tract is alluvial in its formation, and chiefly consists of a stratum of black, and sometimes yellow loam, above which is deposited, when in a state of nature, a rich and deep vegetable mould, the substratum beneath the bed of loam being generally a tenacious gray or blue clay, which in some parts appears at the surface, and, intermixed with sand, constitutes the super-soil. There are numerous and extensive quarries of limestone to be found in these districts, that supply the farmers with excellent materials for building. Freestone is also found, but in small quantities, and generally along the shores of the lakes. The Thames River, in this section, rises far in the interior, and, after pursuing a serpentine course of about 150 miles, in a direction nearly south-west, discharges itself into Lake St. Clair." This portion of the province seems to us to be that most worthy of the attention of the emigrant: the climate is pleasant, the land excellent, the rivers numerous and useful; roads are opening up in all directions for the benefit of the inhabitants; and although at a great distance inland, the communication with the ocean is conveniently kept up by means of the lakes and canals. Were we about to emigrate, we would have little hesitation in directing our steps towards this portion of Upper Canada, so tempting from the prodigious vastness of its waters, the exuberant fertility of its extensive plains, its luxuriant orchards, and its busy scenes of rural industry.

It may here be remarked, that the general salubrity of the climate improves as you recede from the banks of the lakes and great rivers where these happen to be low-lying, and the land adjoining wet and swampy, although such situations possess, as a counterpoise, a greater facility of disposing of surplus produce. The prevailing maladies on the low-lying shores of the lakes and large rivers are fevers and the ague, which, although a most annoying complaint, is very seldom fatal. By great care being given to regularity of the bowels, observing temperate habits, keeping the feet dry, and avoiding unnecessary exposure to the night air, it may generally be averted. We cannot sufficiently impress on the minds of emigrants the necessity they will be under of adhering to temperate habits. In the Canadas, whisky is much cheaper than in Britain; hence this advice becomes of double importance.

Mr. Fergusson, in his "Practical Notes," made during a tour in Canada in 1831, furnishes his readers with a number of valuable illustrations of the state and appearance of the Upper Province along the route he pursued: indeed, all intending emigrants who can afford it should purchase his very instructive volume. Speaking of that part of the territory adjacent to Lower Canada, he says—"Returning to the St. Lawrence, we enter the Upper Province, the Ottawa here forming the boundary line. As we ascend the river, we find numerous settlers and thousands of acres well adapted for the farmer. One of the first settlements we meet with is the Glengarry district, an extensive tract of good land, enjoying the advantages of water carriage. The language, the customs, and the native courage of their Celtic sires, still distinguish the clan, though at the same time, we are afraid, accompanied by some of those less profitable traits which stamp the Highlander as more at home in wielding the claymore, or extracting mountain dew, than in guiding the ploughshare to slow but certain results. The farms are but indifferently improved, considering the advantages they have enjoyed; and much valuable time is expended in the depths of the forest, in a demi-savage life, cutting and preparing timber for the lumber merchant, which, if steadily devoted to the cultivation of the land, would certainly be attended with infinitely greater benefit both in a physical and moral point of view.

"To go minutely into the statistics of even the banks of the river, would far exceed the limits to which I must necessarily restrict myself. Suffice it to say, that a constant succession of eligible situations present themselves for estates and farms. I was much pleased with the Matilda district, and consider it capable of great improvement. The soil is a fine mellow sandy loam, sometimes perhaps rather light, but admirably adapted for turnip husbandry and fine-woolled sheep, with numerous beautiful situations of residences, the noble St. Lawrence ever forming a prominent feature—its surface varied by lovely wooded islands, similar to those we so justly admire on many of our British lakes. In approaching Kingston, or the east end of Lake Ontario, the River Guananogue falls into the St. Lawrence, and at its mouth is the establishment of Messrs. M'Donnell, two brothers who came about eight years ago to the colony, and who, by steady enterprise, without original capital, have realized considerable wealth, while, along with it, they have secured the respect and esteem of all who know them. They have here what is called in America a valuable water privilege, or fall, and have erected flour and saw mills to a large extent.

"Having received very encouraging accounts at Kingston of the country along the Bay of Quinté, a deep inlet of Lake Ontario formed by a peninsula called Prince Edward Island, I made an excursion into that district. The scenery was pleasing, in many places very fine; and settlements are forming on every hand. The soil is partly clay, partly loam and sand, sufficiently rich to yield fifteen crops of good wheat, with impunity, in a period of twenty years. Granite, limestone, and schistus, or clay-slate, are successively met with. Whenever a stream or creek of any importance falls into the lake, there we find a mill-seat and a village growing up, the embryo, in many cases, of considerable towns.

"To the patriot or philanthropist, it is highly gratifying to remark, how the wants of the farmer and the interests of the trader or mechanic co-operate in the rapid progress of general improvement and civilization. Holywell, Sophiaburg, and Belville, are all thriving villages of this description; and many individuals are to be met with in each who, from the humble situations of merchants' clerks, &c., have rapidly risen to independence.

"Toronto (he says in another place) is a very desirable station for a settler to choose as head-quarters, in looking about for a purchase. He is sure at this place to meet with numerous offers of farms, regarding which he will do well to act with caution. The *rich* and *heavy* land of Upper Canada is not to be found in general upon the immediate banks of the lakes and rivers. It lies for the most part from twelve to twenty miles back, and thus compensates the enterprising settler for plunging into the forest."

The shores of the lakes of Upper Canada present many superior stations for emigrants, the soil being of the very best quality, and the climate not so severe as it is in Lower Canada nearer the sea. These districts are rapidly becoming peopled, through the exertions of government and the enterprise of private individuals. Even in the settled districts of both Lower and Upper Canada there is still abundance of good land to be disposed of; and from the desire of many of the older settlers to dispose of their farms in order to procure a larger extent of uncleared or forest land for their rising families, comfortable and well-cultivated farms are constantly to be met with, and to be had frequently cheap and upon easy terms in every district.

The climate of Canada presents very opposite extremes of heat and cold, and the transition from the one to the other is much more sudden than in Great Britain. Notwithstanding this, however, it is healthy; all accounts which we have seen, both those of travellers and the letters of private individuals, agreeing in this respect. The

spring in Canada generally commences about the end of April, and the fields are well covered with vegetation by the beginning of May. The thermometer ranges during summer from about 80° to 84°; in some instances it has reached 102°; but such extreme heat is very rarely felt. Spring, summer, and autumn extend from the end of April to October. Winter commences in November, when thick fogs and snow-storms are frequent. By the middle of December the ground is generally covered with snow, and the frost, especially in Lower Canada, becomes sometimes very intense. The depth of the snow in Upper Canada varies according to seasons, from a few inches to several feet; the average depth, taking one season with another, has been estimated to be between eighteen inches and two feet. The winter in the Upper or western part of the province is much milder than in the Lower or eastern part, and new settlers generally are pleasantly disappointed in not experiencing the rigours which, from exaggerated rumours at home, they had expected to find. January has generally a week or more of open, and sometimes mild weather; and it not unfrequently happens that it is only in February that the weather may be said to be very severe and the frost intense.

In Lower Canada, where winter is most severe, the thermometer ranges from 25° above to 25° below zero. The sky of a Canadian winter is generally almost cloudless, the air bracing, and, from the absence of wind, in spite of the low temperature, the cold is not felt to be disagreeable. From Quebec to Montreal and upwards, the St. Lawrence and other rivers, and also the lakes, cease to be navigable; but the firm icy surface serves as a road for the sleighs and carrioles; and although the entire face of nature is now changed—the varied and pleasing tints of autumn in the forest, and the busy and enlivening signs of commerce upon the lakes and rivers, having given place to one dead and drear-like scene, seemingly destitute of variety; yet the snows and frosts of Canada are hailed as ushering in a season which brings with it no small amount of social enjoyment.

While the external weather is guarded against by warm clothing when out of doors, the habitations of the Canadians are kept comfortably warm, the apartments being heated with stoves, which keep the temperature at a higher and more uniform rate than can be effected by English fireplaces.

The heated air produced by the stoves being considered to be rather unhealthy, the farmers, especially in Upper Canada, in many instances use the large open fireplace, and fearing no scarcity of wood, the substantial billets or huge Christmas-looking logs blaze merrily and warmly on the pair of massy gridirons, conjuring up scenes of the halls of England in the olden time. Winter in Canada is indeed the season of joy and pleasure: all classes and ranks indulge in a general carnival, as some amends for the more enervating toil undergone during the summer months. The double-seated sleigh, with its mettled pair of horses, or single-horse *cutter* of the Upper Canadian, or the carriole of the humble *habitan*, or proud *seigneur* of Lower Canada, is got ready all over the country. Riding abroad on business or pleasure commences; visiting is in active play between friends, neighbours, and relatives; regular city and town balls, and irregular picnic country parties, are quite the rage.

Travelling over frozen rivers or lakes is not unattended with danger, for it sometimes happens that the sleigh, its horses, and passengers, are engulfed and sucked beneath the ice. Fortunately, the thin or weak parts of the ice are in general of no great extent, and in most instances the passengers are able to leap from the vehicle to a part sufficiently firm to bear them. The Canadians have a curious contrivance for saving the horse on these occasions. A rope, with a running noose round the neck of the animal, is on occasions part of the furniture of the carriage. As soon as he sinks in the ice, the driver pulls this rope till he strangles him, or at least so far deprives him of sensation that he can no longer struggle. The poor horse is thus, by a severe process, prevented from doing that which would sink him deeper in the broken ice; and when the passengers are safe, he is pulled upon the firm ice, the rope is loosened, respiration recommences, and generally, in a few minutes, he is carrioling away again as well as ever. A necessity of this kind, however, is believed to be of rare occurrence.

The other British possessions in North America are Nova Scotia, New Brunswick, Prince Edward Island, Cape Breton, and Newfoundland; the last, however, is an island in the Gulf of St. Lawrence, and unsuitable for the settlement of emigrants. The whole lie within the 41st and 51st degrees of north latitude, and from about the 54th to the 68th degree of west longitude. These countries are not so warm or genial as Upper Canada; they are what Scotland is to England—more rugged and mountainous, and more unpromising in their outlines; but they are not less healthy and pleasant; and they possess the advantage of being the nearest colonial possessions of Great Britain, with the likelihood of remaining longest under its paternal government.

NOVA SCOTIA.

Nova Scotia is a peninsula connected with the mainland by a narrow isthmus. It measures about three hundred miles in length, but is of unequal breadth; altogether, it contains 15,017 square miles, or nearly ten millions of acres. One-third of this superficies is occupied by lakes of various shapes and sizes, spread in all directions over the face of the peninsula. There is no part of the land thirty miles distant from navigable water, and in all parts there are fine streams and rivers. The southern margin of Nova Scotia is broken and rugged, with very prominent features, deep inlets, and craggy islands. The features of the northern coast are soft, and free from rocks. It is bounded on the north by part of the Gulf of St. Lawrence, which separates it from Prince Edward Island; on the north-east by the Gut of Canso, which separates it from the island of Cape Breton; on the west by the Bay of Fundy, which separates it from New Brunswick; and on the south and south-east by the Atlantic Ocean. Nova Scotia was first settled by the French in 1603, and till 1712 it was alternately possessed by the French and English, when the latter became its permanent possessors. By the French it was called Acadia.

The soil of a country of such extent and such varied features as Nova Scotia must necessarily be various. If an imaginary line be drawn, dividing the province in the exact centre, from east to west, the north-western half will be found to contain by far the greatest portion of good land. On the side towards the Bay of Fundy, the soil is very rich, and free from stones, and contains many thousand acres of dyked marsh land. This is alluvial land, and is made by the deposit of the tides—a sediment composed of the finer particles of soil, brought away by the rivers and torrents in their course to the Bay of Fundy, of putrescent matter, salt, &c. This land, called marsh, after it has attained a suitable height, is dyked, and the waters of the rivers excluded. Nothing can exceed its fertility. In many places, particularly about Windsor and Truro, it yields three tons of hay per acre, and has continued to do so without manure for fifty years past. There is a difference in its quality. Where the water which overflows it is not much enriched by a long course through the country, it is thin and of an inferior quality. The quantity of land enclosed in this manner is very great. At the head of the Bay of Fundy, there are seventy thousand acres in one connected body. There is one marsh in Cumberland containing nearly as much land as Romney Marsh in Kent, and of a quality

vastly superior. There is something peculiarly agreeable to cattle in the grass growing upon these marshes, which has a wonderful tendency to fatten them. This land is found in great quantities in Cumberland, Macan, Nspan, Londonderry, Truro, Onslow, Shubenacadie, Noel, Kennetcook, Newport, Windsor, Falmouth, Horton, Cornwallis, Granville, Annapolis, &c. The next best quality of land is called by a term peculiar to America, *intervale*, an alluvial soil made by the overflowing of large fresh-water brooks and rivers in the spring and autumn. The quantity of intervale is incalculable. It is to be met with in every part of the province, and is frequently found covered with a long natural grass, several feet in length, and is sometimes called wild meadow. The quality varies according to the size of the brook or river by which it is made, but in general it is very fertile and rich. The upland varies so much, that it is difficult to give a general description of it; but one tract deserves notice from its extent and quality. It commences at Cape Blomidon in Cornwallis, and runs in one continuous ridge of high land for upwards of one hundred miles in the direction of Digby, and varies from three to seven miles in breadth. This is a very strong soil, and, with little exception, of a most excellent quality throughout, producing wheat and other grains in abundance.

The mineral products of this part of America are valuable; but none is so much worthy of consideration as coal, which is found at Pictou, and also at Sidney in Cape Breton; and there can be no doubt that the possession of this mineral will constitute one of the chief advantages of these provinces over every other. Limestone, freestone, and slate abound, of the best qualities, and there is plenty of fine clay for bricks. Iron ore has also been discovered in several places. The province has no animals of a troublesome nature. There are foxes, mice, squirrels, and rats. Among the feathered tribe there are a number of birds of the same kind as in Britain, including those called game in this country, all of which may be shot and used as food without any restriction. The only troublesome insects are the mosquitoes and black flies during hot weather. The rivers abound with the finest fish, among which are salmon and trout; and the shores yield large supplies of white and shell-fish of different kinds.

The climate of Nova Scotia, like that of the adjoining districts, is salubrious and pleasant, but is in a peculiar degree exposed to the extreme of summer heat and winter cold. The ground is generally covered with snow from the 25th of December till the 5th of March, in which respect it nearly resembles Upper Canada; and during this period the farmers draw upon sledges their wood and poles from the forest, and carry their produce to market. It is difficult to say when spring commences, as it is rather late and irregular in its approaches. When vegetation does begin, it is very rapid, and two or three days make a perceptible change in the amount of the foliage. The summer may be said to be short and powerful, and during the time it lasts, it exerts a much greater influence on vegetation than is observable in Britain. During this period the inhabitants go very lightly dressed. Altogether, the climate of Nova Scotia is as good as that of Scotland, if not superior; nor are there any of those local or epidemical disorders with which other countries are frequently afflicted. Although the winters are intensely cold, they are not so disagreeable as the raw changeable winters of this country, nor nearly so fatal to human life. Besides, if the settlers work during three-quarters of a year, they have ample provision for the remaining quarter, and are enabled to look forward to winter as their season of holiday enjoyment and relaxation. We have been informed by a Nova Scotian, that the improvement of the country is greatly retarded by the inactive habits of the settlers. The employment most popular is fishing, and agriculture remains so backward, that large importations of flour from the United States are constantly required, the payment of which drains the country of specie. The farmers, it seems, are in the habit of ceasing to exert themselves after attaining a moderate means of subsistence, and their sons spend the time in riding and other frivolous pursuits, which should be devoted to the improvement of the paternal acres. These half-idle habits, and also an indulgence in spirituous liquors, are described as the true cause of the backward state of the colony as respects its territorial improvement.

Few parts of the world are so well watered as Nova Scotia. The rivers, brooks, springs, and streams of different kinds are very numerous. Some of the lakes are extremely beautiful, containing in general one or more small islands, which are covered with a luxuriant growth of wood, and vary in every imaginable shape. The land in the neighbourhood of them is often undulated in the most romantic manner. These lakes will in time be of great service to the province. In several instances they nearly intersect the peninsula, offering scope for inland navigation. Already a canal has been formed to a certain length.

The fruits produced in the country are numerous. Besides a great variety of wild fruits, gooseberries, strawberries, cherries, and raspberries, there are pears of various kinds, all the varieties of English plums, apples of a very superior quality, and some finer fruits. The other vegetable products are cucumbers, potatoes, artichokes, cauliflowers, cabbages, beans, and peas. Hops are an invariable and sure crop, and may be raised in great abundance. Pumpkins and Indian corn are cultivated to a great extent. Carrots, onions, parsnips, beet, celery, and most other kitchen herbs, are produced with ease. The grains cultivated by the farmers are summer and winter wheat, rye, buckwheat, barley, and oats. The natural forests are elm, cherry, white, black, yellow, and gray birch, red oak, beech, white and yellow pine, white, red, and black spruce, maples, &c.

Nova Scotia is divided into ten counties, including Cape Breton. The chief towns are Halifax, Truro, Londonderry, Onslow, &c. The capital, Halifax, is pleasantly situated on the slope of a rising ground, facing a fine spacious bay or natural harbour in front, on the eastern or more accessible side of the peninsula. It contains about 25,000 inhabitants, and is a central point for the foreign commerce and fishing-trade of the colony. Although possessing considerable wealth and trade, and the seat of an intelligent population, it is behind English towns of the same size and inferior capabilities. Here, as elsewhere in the colonies, a dependence on the arrangements of the home government deadens public spirit, and retards that natural tendency to advance which is observable in the towns of the United States.

Cape Breton is a romantic and mountainous island, lying close to Nova Scotia on the east, and only divided from it by a narrow strait, called the Gut of Canso. On the western side is the Gulf of St. Lawrence. The island measures upwards of a hundred miles in length by about sixty in breadth, including the numerous bays which indent the land. The natural productions of this island resemble those of Nova Scotia, though wheat is less generally grown, and oats and potatoes are raised to a considerable extent. There are large tracts of good land in the lower parts, and the expense of clearing it of timber is estimated at £3 an acre. The minerals of the island are valuable. Cape Breton is politically annexed to Nova Scotia, of which it forms a county.

NEW BRUNSWICK.

The province of New Brunswick, lying on the main land of North America, contiguous to the United States and Lower Canada, consists of an extensive tract, comprising nearly 28,000 square miles, the greater part of which is still covered with dense forests. The land,

nowever, is generally fertile, and excellently adapted for the settlement of emigrants. Besides being recommended by the fertility of its soil, it possesses innumerable rivers and streams in all directions, suitable for purposes of trade or manufacture. The climate is salubrious; the natural products numerous and valuable; wild animals are plentiful; and the rivers and lakes abound in fish; while along the coasts, cod, haddocks, salmon, and other fish, are yielded in plenty to the enterprising fisher. The resources of the province are thus inexhaustible, and, according to Macgregor, suitable to the maintenance of at least three millions of inhabitants. As yet, New Brunswick has a small population, and the principal settlements are along the River St. John and its lakes. On the northern side of the entrance to this large river from the Bay of Fundy, stands the town of St. John, the largest in the province, and the seat of an extensive trade. Fredericton, which claims to be the metropolis of the colony, is situated nearly ninety miles above St. John, on the same river; it is still a village in appearance. The chief buildings are the government house and a college.

The province of New Brunswick presents an extensive line of coast to the Gulf of St. Lawrence on the east, while on the north it has part of Lower Canada, which separates it from the River St. Lawrence upwards. Its latent capabilities for carrying on trade with the interior are thus very considerable. Miramichi is the chief river after the St. John. It falls into the Gulf of St. Lawrence, and is navigable for large vessels for about forty miles. Along its banks, here and there, are seen the huts and houses of settlers, who have not made great advances in cultivation. The cutting and export of timber form the main trade of the district. About twenty miles up, on the south bank, is seen the village of Chatham, where many of the ships load, and where several of the merchants are settled, who have erected stores and wharfs. Four miles further up stands the village of Newcastle. The Miramichi River divides into two great branches. "On coming down the south-west branch (says Mr. Macgregor) in the autumn of 1828, from where the road from the River St. John joins the Miramichi, about eighty miles above Chatham, I was astonished at the unexpected progress made during so short a period in the cultivation of the soil. Near where the road parts off for Fredericton, an American possessing a full share of the adventurous activity of the citizens of the United States, has established himself. He told me that when he planted himself there, seven years before, he was not worth a shilling. He has now (1829) more than three hundred acres under cultivation, an immense flock of sheep, horses, several yokes of oxen, milch cows, swine, and poultry. He has a large dwelling-house, conveniently furnished, in which he lives with his family and a numerous train of labourers; one or two other houses, a forge, with a powerful trip-hammer worked by water-power, fulling-mill, grist-mill, and two saw-mills—all turned by water. Near these he showed me a building which he said he erected for the double purpose of a school and chapel, the floor of which was laid, and on which benches were arranged so as to resemble the pit of one of our theatres. He said that all preachers who came in the way were welcome to the use of it. An English parson, a Catholic priest, a Presbyterian minister, or a Methodist preacher, should each, he said, get something to eat at his house, and have the use of the chapel, with equal satisfaction to him. He then showed me his barn, and in one place a heap, containing about ninety bushels of Indian corn, that grew on a spot (scarcely an acre) which he pointed out to me. This man could do little more than read and write. His manners were quite unpolished, but not rude; yet he had wonderful readiness of address; and, as far as related to his own pursuits, quick powers of invention and application. He raised large crops, ground his own corn, manufactured the flax he cultivated and the wool of his sheep into coarse cloths; sold the provisions which his farm produced, and rum and British goods, to the lumberers kept a tavern; employed lumberers in the woods, and received also timber in payment for whatever he sold. He made the axes and other tools required by the lumberers at his forge; he ate, gambled, and associated with his own labourers, and with the lumberers, and all others who made his house a kind of rallying point. He appeared, however, to be a sober man, and a person who had in view an object of gain in every thing he engaged in. He talked much in praise of the rich interior country, and how rapidly it would be settled and cultivated if possessed by the Americans."

PRINCE EDWARD ISLAND.

This rich and productive island is situated in the Gulf of St. Lawrence, between Cape Breton on the east and New Brunswick on the west, and is separated from Nova Scotia on the south by a strait of about nine miles in breadth. It measures 140 miles in length, and is 34 at its greatest breadth. The general appearance of this island from the sea is level, but, on landing, the scenery is varied with gentle undulations. It abounds with streams and lakes, and in many places it is indented with bays, no part being more than eight miles from the sea. The soil is in general fertile, yielding good crops of wheat and other grains; and parsnips, turnips, carrots, potatoes, and almost all the common culinary vegetables, succeed well. This island has been recommended to such emigrants as possess a knowledge of agriculture with that of the curing of fish. The climate of Prince Edward Island is in some respects similar to that of the neighbouring countries. The winter is said to be shorter than in Lower Canada, and the atmosphere is noted for being free of fogs. Agricultural operations commence about the beginning of May, and the harvest is generally over by the end of October. The chief disadvantage this colony labours under, and which is equally applicable to the others near it, is the great length of the winter, which obliges the farmer to lay up a very large stock of hay for supporting his live-stock. The sudden manner, also, in which spring comes on, abridges the period for sowing and planting, thus leaving the agriculturist comparatively idle at one season, and obliging him to work severely at another. The inhabitants are chiefly from Great Britain and Ireland, with a few Dutch and Germans. Mr. Macgregor characterizes them as hospitable, kind, obliging, and as, generally speaking, a moral people. The island is governed by a lieutenant-governor, council, and house of assembly consisting of eighteen members, who are elected by the people. Charlotte Town, the capital, is situated on the north bank of the river Hillsborough, on the east side of the island. The town stands on ground which rises in gentle heights from the banks of the river, and its harbour is considered one of the best in the Gulf of St. Lawrence. A small group of islands called the Magdalens have been recently annexed to Prince Edward Island, chiefly as fishing establishments.

Little requires to be said respecting the trade of Canada, or of British America generally. To Halifax, Quebec, Montreal, St. John, and other ports, shipments of English manufactured goods and foreign produce are regularly made, chiefly in spring and autumn, and the produce returned is wood, fish, oil, potashes, salted beef and pork, some butter and cheese, and of late, a not inconsiderable supply of wheat and flour. The total of our exports annually to British America was, in 1833, under £2,000,000, while the military and civil expenditure incurred by the mother country in 1836 was £382,735, thus showing that, as regards commerce, Britain loses a considerable sum yearly by maintaining

these colonies. British America is highly favoured by being permitted to send its produce at comparatively low duties to the home country; but from lack of capital or enterprise, this does not appear to have so important an effect as might be expected on the prosperity of the colonies. The comparatively independent, easy, and comfortable circumstances, with light taxes, experienced by colonial farmers, may perhaps account most naturally for the absence of ambition or enterprise among a scantily-educated and plain-living people. Agricultural societies and periodicals, in conjunction with the recently more encouraging terms on which colonial produce is admitted into the British market, have, of late, however, exercised considerable influence in Canada, and with the increasing supply of bread-stuffs and salted provisions from the colony, the circumstances of its farmers, and its condition and prospects generally, are understood to be steadily and cheerfully improving. The duty on wheat imported into this country from Canada and other British possessions in North America, is 5s. a quarter when the average price of wheat in this country is less than 55s. a quarter; 4s. when 55s. and under 56s.; 3s. when 56s. and under 57s.; 2s. when 57s. and under 58s.; and 1s. when 58s. and upwards. Wheat, when imported from foreign countries, when the price is 58s. a quarter in this country, pays a duty of 14s. a quarter. The duties on the importation of salted provisions are similarly favourable to the colonies. Hams and bacon, which pay a duty of 14s. a cwt. when imported from foreign countries, are admitted from the colonies on paying a duty of 3s. 6d. a cwt. Foreign butter and cheese pay respectively 20s. and 10s. 6d. a cwt., while colonial are admitted for 5s. and 2s. 6d. a cwt.

PERSONS WHO OUGHT TO EMIGRATE.

"The persons who may be inclined to emigrate to Upper Canada," says Howison, "are of three different descriptions; namely, the poor peasant or day-labourer; the man of small income and increasing family; the man possessing some capital, and wishing to employ it to advantage. Persons of the first class never would repent if they emigrated to Upper Canada, for they could hardly fail to improve their circumstances and condition. The poorest individual, if he acts prudently, and is industrious, and has a common share of good fortune, will be able to acquire an independence in the space of four or five years. He will then have plenty to eat and drink, a warm house to reside in, and light taxes to pay; and this state of things surely forms a delightful contrast with those hardships and privations which are at present the lot of the labouring population of Great Britain.

"It is evident that some descriptions of emigrants will succeed better in Upper Canada than others. Those who have been accustomed to a country life and to country labour, are of course more fitted to cultivate land, and endure the hardships at first attendant upon a residence in the woods, than artisans or manufacturers, whose constitutions and habits of life are somewhat unfavourable to the successful pursuit of agriculture. But every individual, who to youth and health joins perseverance and industry, will eventually prosper. Mechanics cannot fail to do well in Upper Canada; for when not employed in clearing lands, they will find it easy to gain a little money by working at their professions; and they likewise have the advantage of being able to improve their dwelling-houses and repair their farming utensils at no expense. Weavers, being ignorant of country affairs, and unaccustomed to bodily exertion, make but indifferent settlers at first, and their trade is of no use to them whatever in the woods. Married persons are always more comfortable, and succeed sooner in Canada than single men; for a wife and family, so far from being a burden there, always prove sources of wealth. The wife of a new settler has many domestic duties to perform; and children, if at all grown up, are useful in various ways."

Every candid traveller in Canada concurs in these views; and it may be observed that they are equally applicable to the other districts noticed in this sheet. "Of this, I think," says Fergusson, "there can be no doubt, that either the moderate capitalist, or the frugal, sober, and industrious labourer or artisan, cannot fail of success. *Fortunes* will not be rapidly or even readily acquired; but it must be the settler's own fault if he does not enjoy, in large abundance, every solid comfort and enjoyment of life, and rear around his table even a *forest* of 'olive plants,' without one anxious thought regarding their future destination or provision."

PASSAGE.

There are two ways of proceeding to Canada—by the St. Lawrence, Quebec, and Montreal; and by New York and the Erie Canal. The passage by the St. Lawrence is tedious and troublesome, and we recommend all who can conveniently do so to take shipping direct to New York; from that city they will at once go on by a steamboat on the Hudson River to Albany, and from Albany be conveyed in a track-boat on the Erie Canal, or by railway, to Lake Erie, where they will find steamboats ready to convey them in all directions. For those who prefer the passage by Quebec, the following information is given by an official pamphlet:—"Passages to Quebec may either be engaged inclusive of provisions, or exclusive of provisions, in which case the shipowner finds nothing but water, fuel, and bed-places, without bedding. Children under fourteen years of age are charged one-half, and under seven years of age one-third, of the full price; and for children under twelve months old no charge is made. Upon these conditions the price of passage from London, or from places on the east coast of Great Britain, has generally been £6 with provisions, or £3 without. From Liverpool, Greenock, and the principal ports of Ireland, as the chances of delay are fewer, the charge is somewhat lower [we would here strongly advise emigrants to sail, if possible, from a port on the west coast, as being a great saving of time, trouble, and expense]; this year the charge will probably be from £2 to £2, 10s. without provisions, or from £4 to £5 including provisions. [Emigrants intending to settle in New Brunswick, Cape Breton, or Prince Edward Island, will generally obtain a passage in the vessels bound for Canada; and ships for Halifax or Pictou in Nova Scotia are constantly sailing from the British ports.] In ships sailing from Scotland or Ireland, it has mostly been the custom for passengers to find their own provisions; but this practice has not been so general in London; and some shipowners, sensible of the dangerous mistakes which may be made in this matter through ignorance, are very averse to receive passengers who will not agree to be victualled by the ship. Those who do resolve to supply their own provisions should at least be careful not to lay in an insufficient stock. Fifty days is the shortest period for which it is safe to provide; and from London the passage is sometimes prolonged to seventy-five days." Having wound up his affairs in this country, and otherwise prepared himself and family for proceeding to the land of their adoption, it is recommended that the emigrant should be exceedingly cautious how he disposes of any portion of his funds previous to setting out. An ordinarily good stock of clothing he may safely direct his attention to procure; and for the purpose of insuring greater comfort, such clothing would better be had lighter in fabric for summer, and heavier for winter, than is usually worn in this country. Strong linen jackets and trousers are frequently worn during summer, and flannel under-clothing is generally used both during summer and winter; cotton in preference to

linen shirts are generally worn. Pilot, beaver, and tweed cloths are commonly used for winter wear; and among working-people, not unfrequently stout moleskin and the domestic cloth of the country, exactly similar to that which was used, and in some instances is still worn, in our own rural districts. Fur caps during winter, and straw hats in summer, are in common use. The intending settler in Canada need, however, give himself no concern about laying in any large stock of clothing, as all sorts, and perhaps better suited to the climate and habits of the country, may be had at reasonable prices in almost every part of Canada. Many settlers have had reason to repent their having incautiously laid out a great portion of their funds before embarking, which, they afterwards experienced to their loss, would have been much more valuable to them in the colony than any purchases of articles for use or speculation they had made or could have made at home. American coarse boots and shoes, for instance, are to be had as cheap, if not cheaper, in Canada than they can be had in this country; and American axes, saws, and edge-tools are usually preferred in Canada before the English-made articles, as, although higher in price, more attention is believed to be bestowed in the selection of the metal, and in the tempering of the tool, and the pattern or shape is better adapted to its peculiar purposes in the colony. Furniture may be purchased very reasonably in almost every part of Canada, from the plainest to the most costly description.* Medicines are invariably provided upon the voyage by the captains of vessels, and dispensed without charge to passengers. Great attention should be paid, both during the voyage and upon landing, to preserve the bowels in regularity. When this cannot be effected by diet, a dose of simple medicine should be resorted to. Provisions, and what articles the intending voyager determines to take with him, should be conveniently packed in substantial handy trunks. Potatoes may perhaps be best carried and preserved during the voyage in a good barrel, having the top secured by hinges and a padlock.

Scotch families usually and very judiciously provide themselves with a sufficient quantity of oatmeal, eggs well packed, some tea and sugar, besides other provisions. A few cooking utensils are indispensable; and tin dishes, for eating out of when the sea is running high, and the vessel heaving, would be an advantage. Milk boiled with loaf-sugar, in the proportion of one pound of sugar to a quart of milk, and bottled when cool, will keep sweet all the voyage.

The following we quote from the letter of a Scotch emigrant:—"Upon the voyage out, your provision-store should consist mostly of oat-meal, plenty of potatoes, eggs, hams; a good supply of porter and ale you will find to be very useful. Tea will not be much used; coffee will. Bring along with you some rice, with every other article to make a rice-pudding; and particularly bring plenty of red herrings; you will find these very useful indeed; a few dried fruits, &c. Be sure to bring provisions for three months at least; and if you do not require them all on the voyage, you will find them of great use to you afterwards."

A Scotch emigrant in Upper Canada, in a letter published in the Counsel for Emigrants, gives the following list of provisions to be taken to sea for four persons as steerage passengers:—"16 or 18 pecks of potatoes in a barrel with a lock on it; 40 lbs. of good beef, well salted in brine; 16 lbs. of butter; 3 lbs. of coffee; 3 or 4 dozen of *old* bottled beer, which has less chance of flying than if new; some dozens of eggs packed in salt; half a dozen cod-fish, cut in pieces for boiling; some dozens of Buckie haddocks, well dried for keeping. Milk does not keep well; no sweetmeats are relished at sea. A few oranges, which at times taste very pleasant to the parched palate; some cheese; 8 lbs. of treacle in a flagon; 1 stone of barley; a good deal of pepper and mustard; plenty of carrots, turnips, and onions, for broth—they will keep all the voyage; 28 lbs. of fine ship bread; 8 or 10 quartern loaves, baked hard; 1 boll of oatmeal, 6 pecks baked into bannocks and cakes, very well fired, and flat for packing; some white puddings; some suet for dumplings; a few candles, and a white-iron lantern with horn; 1 bottle of vinegar, to use in water on shipboard; 1 bottle of castor-oil; 2 or 3 dozens of colocynth and rhubarb pills; 6 lbs. of epsom salts, and 1 lb. of senna—these medicines are very dear here; tin pan to fit the stove of the ship—and it is convenient to have one for hooking on the ribs of the grate when the top of the fire is occupied; kettle for making coffee, &c. Use no crockery, but instead, jugs and bowls of tin; broth-pot, frying-pan, and tin-kettle."

The best months for leaving England are certainly March and April: the period during which the greatest number of vessels sail is between the 1st and 15th April. The names of the vessels to sail are generally advertised in the newspapers. The conveyance of passengers to the British possessions in North America is regulated by an act of parliament (5 and 6 Vic. cap. 107), of which the following are the principal provisions:—Ships are not allowed to carry passengers to these colonies unless they be of the height of six feet between decks, and they must not carry more than three passengers for every five tons of the registered burden; there must be on board at least fifty gallons of pure water, and seventy pounds of bread, biscuit, oatmeal, or rice, for each passenger.* Masters of vessels who land passengers, unless with their own consent, at a place different from that originally agreed upon, are subject to a penalty of £20, recoverable by summary process before two justices of the peace in any of the North American colonies. The enforcement of this law rests chiefly with the officers of her majesty's customs; and persons having complaints to make of its infraction, should address themselves to the nearest custom-house or government emigration agent. These officers act under the instructions of the Government Emigration Commissioners in London (a board constituted to superintend emigration and the diffusion of information regarding the colonies, and who have their office in Park street, Westminster.) The agents of these commissioners, who are all officers of the royal navy, are stationed at most of the chief ports; namely, London, Liverpool, Glasgow, Greenock, Dublin, Belfast, and two or three other Irish ports. Their duties are to afford information as to the facilities for emigration from their respective ports, such as the sailing of ships, means of accommodation, and that the provisions of the passengers' act be strictly complied with, as in regard to the sea-worthiness of vessels, their having a sufficiency of provisions, water, medicines, &c., on board, and that they sail with punctuality. Agreements or receipts for passage-money require to be furnished according to a particular form by the captain, shipowner, or *properly authorized or licensed* agent, so that no undue advantage may be taken of passengers. Expenses may be summarily obtained from the captain or owners of the ship for each day persons may be detained beyond the time fixed for sailing, except when the cause of detention is unfavourable wind or weather. The passengers' act applies to all vessels leaving British ports, and carrying steerage passengers: the benefits of the act are not extended to cabin passengers.

LANDING.

Previous to disembarkation, arrange your baggage in a

* Steerage passengers require to prov de themselves with a mattress and bedding.

* One half of this supply of provisions is allowed by the act to be furnished in potatoes, five pounds of potatoes being computed to be equal to one pound of bread.

small compass, the fewer packages the better, but have them well secured—old dirty clothing, large boxes, and other useless articles, are not worth the carriage. If you have any provisions left, such as oatmeal, potatoes, &c., you can sell them at Quebec, and avoid the expense of transport, and you can purchase bakers' bread, butter, tea, sugar, and other necessaries more suited for your journey. All sorts of provisions may be bought cheaper, and generally of a better quality, in Montreal and Upper Canada than at Quebec. Dress yourself in light clean clothing. Females frequently bring on sickness by being too warmly clothed. Cut your hair short, and wash daily and thoroughly. Avoid drinking ardent spirits of any kind, and when heated, do not drink cold water. Eat moderately of watery food. Avoid night dews. By attending to the preceding directions, sickness will be prevented, with other serious inconveniences. When every thing is ready for disembarkation, and if the ship is lying at anchor in the river, take care in passing from the ship to the boat. Avoid all haste, and see that your baggage is in the same conveyance with yourself, or left under the charge of some friend, with your name on it. If the ship hauls to the wharf to disembark, do not be in a hurry, but await the proper time of tide, when the ship's deck will be on a line with the quay or wharf. Passengers are entitled by law to the privilege of remaining on board ship forty-eight hours after arrival; and it is unlawful for the captain to deprive his passengers of any of their usual accommodations for cooking or otherwise; you may therefore avoid the expense of lodgings, and make all your arrangements for prosecuting your journey. If, previous to disembarkation, sickness should overtake you, proceed immediately, or be removed, to the Emigrant Hospital, in St. John's Suburbs, where you will be taken care of, and provided with every thing needful until restored to health. Medicine and medical advice can also be had at the dispensary attached to the Quebec Charitable Emigrant Society. This society will grant relief to all destitute emigrants. In Montreal there is a similar institution for the relief of emigrants. It is particularly recommended to emigrants not to loiter their valuable time at the port of landing, but to proceed to obtain settlement or employment. Emigrants not unfrequently find employment in the city of Quebec and its vicinity, as also in and about Montreal. Single men, in particular, are advised to embrace offers of this kind; but emigrants with large families had better proceed without delay to Upper Canada, as hereafter directed, or to situations in Lower Canada, particularly the eastern townships; and if they have sons and daughters grown up, they will very probably find a demand for their services. Artificers and mechanics of all denominations, and farming labourers, if sober and industrious, and good workmen, may be sure of doing well. Blacksmiths, particularly those acquainted with steam-engine work, also good millwrights and sawyers by machinery, have an excellent field for improving their circumstances in Canada. The current rate of wages lately paid to carpenters, masons, and other artificers, was from 3s. 6d. to 6s. or 7s. per day, according to circumstances; farm-labourers were paid at a lower rate. There is little demand for persons skilled in the ornamental professions, or for the preparation of articles such as are usually imported from England. Emigrants with families, and who are possessed of from £20 to £25, are advised to push immediately into the interior in the vicinity of old settlements, where they can obtain provisions for their spare labour. The most vexing circumstance connected with money matters, is that the currency of the whole of British America is different from that which prevails in the United Kingdom; in other words, a shilling in England is different from a shilling in Canada. The money of Canada is locally of higher nominal value than what we understand by the term *sterling*, and is called Halifax currency. The difference varies; but it may be stated in general terms, that an English sovereign is reckoned to be worth 24s. 6d. currency; or an English shilling is equal to about 1s. 2¼d. or 1s. 3d. currency. All wages are, of course, reckoned in currency. Therefore, when it is said you will receive 4s. a day of wages, the actual value of this 4s. is only 3s. sterling. This distinction between currency and sterling will soon be learned, and is on the whole of less consequence than the practice of paying wages in goods. We have heard very serious complaints on this subject. From all we can learn, it is not uncommon for an employer to pay his workmen by an order for goods on a store, corresponding to the amount bargained for; and such is the high price at which articles are usually sold when such orders are presented, that sometimes a workman, instead of getting 4s. a day, does not in reality get more goods than he could buy for 1s. 6d. in England. Thus an apparently high wage dwindles down to a trifle. Perhaps such practices are not resorted to by respectable employers, or may only prevail in parts of the country where a circulating medium is scarce; but we have considered it proper to mention the circumstance, in order to put emigrants on their guard. Always ascertain whether you are to be paid in cash or in goods, and act accordingly.

Having arranged all your business at Quebec, you will proceed without loss of time to Montreal, by steamboat, on your route to Upper Canada. Several steamboats ply daily to Montreal, 180 miles up the St. Lawrence, which is performed in from 24 to 30 hours. The fares on board the steamboats were lately as follow (but all may now be a little altered):—Deck passengers, adults, one dollar each; that is, 5s. currency, or about 4s. sterling; children under twelve years of age, half-price; and under seven, one-third. The routes and fares to the principal places were lately as follow:—

Quebec to Montreal, by steamboats, - - -	4s.
Montreal to Kingston, by steam, - - - - -	12s.
Kingston to Toronto, by steam, - - - - - -	12s.
(Touching at Coburg and Port Hope.)	
Toronto to Hamilton, by steam, - - - -	4s.

Steamboats also ply from Kingston, Toronto, and Hamilton, to Niagara and Queenston. From Queenston, on the river Niagara, a few miles below the famous Falls, the traveller may proceed to Buffalo, or to a port on the Canada side of Lake Erie, and take a steamboat for Port Stanley, in the London district, Amherstburgh, on the river Detroit, Sarnia, on the river St. Clair, or Goderich, on Lake Huron. Stage-coaches or wagons are to be had from all the chief places on the lake or river coast, to all the principal settlements in the interior; the cost of travelling by stage is usually from 2½d. to 3d. per mile for each passenger. The hire of a wagon, with a pair of horses, is generally three dollars, or about 12s. sterling, a day. A comfortable wagon upon springs, and with good horses, should be selected. At most of the towns in Canada government agents are stationed, to afford gratuitous information and advice to emigrants.

Persons proceeding to the thriving settlements in the Newcastle district, disembark at Coburg or Port Hope, on Lake Ontario. Those going to the townships of Seymour may proceed from Kingston, by the beautiful Bay of Quinté, to the mouth of the Trent river, from whence a road, distance 18 miles, brings you to Seymour. If proceeding to the Home district, disembark at Toronto, the capital of Upper Canada. If for the London district, proceed either by the Niagara frontier to Lake Erie, or take the stage-coach direct from Hamilton to London. The distance is between 80 and 90 miles, and the road is now reported to be one of the best in Canada. A similarly good road, all well planked, takes the traveller from London westward to Chatham. Stage-coaches run every day. Stages run twice or thrice a week from London to Goderich, Sarnia, and Port Stanley; and also from Hamilton to Dundas, Galt, Guelph, and Goderich. If for Bytown, Grenville,

Horton, or other situations on the Ottawa river, proceed from Montreal and Lachine by the usual conveyances. Such are the directions that were a short time since suitable; but as there are continual changes, emigrants may find it necessary, on their arrival, to act more by local information than any thing we can say on the subject.

We think it important to mention, for the benefit of the poorer class of emigrants, that there has existed for some years in Montreal a benevolent society of great local importance, called the Canada Immigration Association. This body of individuals, actuated by humane motives, and desirous of forwarding labourers to places where their services are required, affords ready assistance to poor emigrants on their arrival at Montreal. It appears that, from the 11th of June, 1840, to the close of the navigation by frost a few months later, the society relieved 322 natives of England, 8778 natives of Ireland, 397 natives of Scotland, and 10 from Germany; total, 9507. Of this number, 201 were above sixty years of age, and 587 were infants. The relief consisted in furnishing provisions and a humble kind of lodging in sheds, also medical attendance, and payment of passage of individuals and families to places in the interior. The emigrants were greatly benefited by being sent off without loss of time, as they were thereby not only saved from the danger to their health and morals, which would have been incurred by remaining any length of time idle in a large city, but their time was economized, which is the most important consideration of all when the necessity of making preparations for the rigours of a Canadian winter is considered. Such was the desire of the society's committee to expedite emigrants, that in some instances they were sent off from Montreal, and actually on their route to Upper Canada, within thirty-six hours of their arrival in Quebec, and in all instances delay was as far as possible avoided.

SALE OF LANDS.—SETTLEMENT.

The mode of selling crown lands in the British North American possessions was, until recently, far from satisfactory, the principle formerly pursued being to have periodical auctions of lands at upset prices; and the emigrant, after waiting perhaps for a very inconvenient period, would find himself outbidden in price. The crown lands in all the North American colonies now, are understood to be offered at fixed prices, varying from about 2s. 6d. to 14s. an acre for wild lands generally. In the cases of town and pasture lots, the prices which from time to time are fixed upon such may range most frequently from £4 to £8 an acre, and in some instances much higher. With regard to the prices and modes of sale of lands in Canada, we are enabled to supply the most recent information from a lately published work, "Views of Canada and its Colonists, by a Four Years' Resident," (Edinburgh, 1844)—a work we can confidently recommend for the fulness and trustworthy character of its details.

"Lands in Canada (proceeds this authority) may be purchased either from government, incorporated companies, or private individuals. The lands under the control of the government are classified into crown lands, clergy-reserves, school-reserves, and Indian reserves, and are scattered over every district of the colony. The incorporated land companies in Canada are two, the British American Land Company, and the Canada Company. The lands possessed by the former are situated in Lower Canada; and the Canada Company's lands in the Upper or Western division of the province. This latter company, which was incorporated in 1826, possesses scattered lands in every district, and almost every township of Upper Canada, besides large territories or tracts in the Wellington and Huron districts, the latter consisting of a million of acres. The lands held by private individuals for sale are situated in every part of the colony, and consist of tracts and scattered lots which have been purchased for speculation, or acquired in payment of debts, chiefly by merchants, and lots of from 100 to 1000 acres in the occupation of the proprietors, and partly cultivated. Dividing the description of lands in Canada into the two classes of waste or wild lands, and lands partly cultivated or cleared, some information respecting them is subjoined.

"*Wild Lands.*—The crown lands, by an act of the colonial legislature, are to be sold at a price to be from time to time fixed by the governor in council. The present fixed price for such lands in Upper Canada is 8s. currency, or 6s. 7d. sterling per acre. This price does not apply to lands reserved by government for non-payment of the conditions of settlement on which they were granted under a former system now abolished, nor to lands called Indian reserves, and clergy-reserves, which three classes are, as well as town and village lots, subject to special valuation.' The Government Gazette publishes respecting the crown lands, which are to be had for 8s. currency, that the lots are to be taken at the contents in acres marked in the public documents, without guarantee as to the actual quantity; that no purchase-money will be received by instalments, but that the whole, either in money or 'land scrip,' must be paid at the time of sale. On the payment of the purchase-money, the purchaser will receive a receipt which will entitle him to enter upon the land purchased, and arrangements will be made for issuing to him the patent deed without delay. [The 'land scrip' mentioned above is paper issued by the colonial government in satisfaction of U. E., or other claims for lands adjusted by this means, and which paper, bearing a certain value attached by government, and taken as payment for lands, is frequently to be purchased much under the nominal value from the holders for ready cash.]

"For public convenience, government agents are appointed in each municipal district, 'with full powers to sell to the first applicant any of the advertised lands, which, by the returns open to public inspection, may be vacant within the district.'

"In addition to the crown lands offered for sale at 6s. 7d. sterling per acre, the colonial government has set apart settlements in both Upper and Lower Canada, in which individuals of twenty-one years of age and upwards, who have never obtained a grant of land from government, may receive a farm lot of 50 acres without purchase, upon certain conditions. The settlements in Lower Canada are upon the Lambton and Kennebec roads, the former leading from the village of St. Francis, through Tring, to the townships of Forsythe and Lambton; and the latter being a continuation of the Kennebec road from Aubert de Lisle to the Province Line. The settlement in Upper Canada is upon a road which commenced opening in 1842 at the expense of government, through the crown land from the north-west angle of the township of Garrafraxa, in the Wellington district, to Owen Sound upon Lake Huron. The road which opens up this important new territory terminates at Lake Ontario, from which Owen Sound is distant somewhat over a hundred miles. The chief conditions to be observed by settlers are—

"They are to make application to the commissioner of crown lands, or to the agent on the ground, wherever they shall be ready to become resident on the tract to be granted. Upon giving a satisfactory account of their means of providing for themselves until a crop can be raised from the ground, they will receive a ticket from the commissioner at the crown land's office, entitling them to locate the land. Upon application to the agent in the first place, he will forward a statement to the crown land's office of the applicant's age, family and means of settlement, upon which, if approved, authority for location will issue. Settlers will be required

to clear and place once under crop one-third of the land located, and to reside on the land until this settlement duty is performed; and after one-third of the grant shall have been cleared and under crop, the settler shall be entitled to his patent free of expense. The settlement duty is required to be done within four years from the date of the ticket.'

"The class of lands known as clergy-reserves are subject to the disposal of the commissioner for crown lands and his agents in each district. The amount of these lands to be disposed of in any one year in Canada is limited to one hundred thousand acres, except with the written approbation of one of her majesty's principal secretaries of state. The lands are reported upon and valued by inspectors appointed by the crown land's commissioner, and returns upon oath are made by the inspectors of the extent, nature, and other particulars, including the value of such lands; and upon the returns being approved of by the governor in council, the same shall be communicated to the commissioner of crown lands, and the lands contained in such returns shall be considered open for sale, and the price stated in such returns as confirmed, including the value of improvements, to the first person who shall apply for, and pay for the same.'

"The sale of clergy-reserves are subject to the following terms:—'Two-sixths of the purchase-money to be paid in hand, and the remaining four-sixths in four equal annual instalments, payable on the first day of January in each year, with interest, at the rate of six per cent. per annum—the first of the instalments to fall due and be payable on the first day of January next ensuing after any such sale.'

"The lands of the British American Land Company in Canada are situated in a district of country in Lower Canada, known as the Eastern Townships, and amount to about 700,000 acres. The price of the new or wild land of this company, according to their published papers, is 6s. to 8s., and near towns, 12s. an acre.

"The Canada Company, whose lands are in Upper or Western Canada, have for a number of years been concerned in selling properties to settlers on liberal terms, likewise in giving leases to those who are indisposed to buy lands, with the option of afterwards becoming purchasers of what they have been paying a rent for. It is very easy gaining information on all these points in the colony. New printed lists of land (which may be seen in every post-office and store in Canada West), and any particulars, may be obtained, free of charge, upon application, if by letter post-paid, to the company's office at Goderich, or Toronto. In order to afford every assistance to industrious and provident settlers, the Commissioners of the Canada Company in the province will receive any sum, no matter how small the amount may be, for which their lessee settlers may not have immediate want, on deposit, allowing interest at the rate of four per cent. per annum for the same, when remaining in their hands for ninety days or upwards; but it is clearly understood that the full amount, with interest accrued, shall at all times be at the disposal of the settler without notice. For this purpose the company have opened an account, which is termed 'Settlers' Provident or Savings' Bank Account,' thus affording to the provident settler every facility for accumulating sufficient money to purchase the freehold of the land which he leases, whenever he chooses to do so, within the term of ten years. But should bad harvests, or any unforeseen misfortunes visit him, he has always the amount deposited, with interest accrued, at his disposal to meet them.

"*Improved Farms.*—It is, as will be conceived, difficult to state the precise prices at which improved farms can be purchased, the locality, amount of improvements, and particular circumstances of persons wishing to sell, having all to be taken into account. It may be generally remarked, however, that such farms, say usually about 200 acres, with 40 acres, or less or more, under cultivation, and having dwelling-house, farm-buildings, and sometimes implements and stock, are frequently to be bought under real value. The number of farms in the market of this description rises, in many cases, from the possessor wishing to purchase a large extent of wild or waste land for the purpose of sharing such with his grown-up family. In the greater number of instances, perhaps, farms partly cultivated are to be had for about £3, 10s. to £5 an acre. Good bargains are frequently to be had when purchasers are able to pay ready money. An instance I am able to mention of an Englishman who arrived in the London district in the spring of 1843, and who purchased a farm of 100 acres, one half cleared, with a dwelling-house upon it, though not very good, a frame barn, and also some stock, for £350 currency, or about £286 sterling, ready money. This farm is about four or five miles from the town of London, and was considered to be a cheap purchase. Another instance I know of is of a farm about the same distance from the town, and the same size as the above, but understood to possess a better soil, having had an offer of a purchaser for £600 currency, or £493 sterling; and the bargain, though not concluded when I heard of it, was expected to be. Like the other farm purchased for £350 currency, this one had also 50 acres cleared, with a frame barn and dwelling-house, though the latter of a rather poor description. There are mostly always advertisements of farms for sale to be found in the various newspapers throughout the country, and many bargains are had in this way; but it is ever a great drawback that, with few exceptions, the price is not stated.

"Wild or waste lands near towns frequently bring a price apparently disproportionate to their value, compared with the low price of cleared farms. This is chiefly owing to the timber in such situations being valuable for fuel. A lot of 150 acres of woodland, within two and a half miles of London, was lately sold for £500 currency, or about £411 sterling, and shortly afterwards easily resold for the same amount.

"The least quantity of farm land sold by government is 50 acres, and the least quantity disposed of by the Canada Company is 100 acres. The usual size of farms in Canada is 200 acres; 100 acres, however, is considered a fair size for persons of moderate means. With respect to the important matter of ascertaining the validity of titles in cases of purchases from private individuals, it may be mentioned that each county has a register-office, in which titles to lands are recorded. The charge for a search is 1s. 6d."

In making a selection and purchase, we would advise the emigrant to keep in mind the following points:—See that there is a tolerable road to the property; that it is not too far distant from a town; that it is not environed with clergy-reserve lands, which, being uncleared, and without roads, except you assist to make them, are a nuisance; that you will have decent neighbours (English or Scotch, if possible); and that the neighbourhood possesses a place of public worship, and school, or will shortly have them.

The difficulties at first in fixing and settling upon a farm are very great—much greater than one in ten has any idea of; but by prudent and diligent management no one need despair, and in the end a state of comfort will unquestionably be attained. Having acquired a property, the first thing you have to do is to select a favourable spot for your log-house, which should be near a spring of water or running stream, and where a *cellar to keep your potatoes in winter can be dug under the house*. Carefully clear the timber and brush to a distance from your dwelling and out-buildings, or, in the event of fire in the woods, great risk is incurred of

their being destroyed. If you proceed to build houses and clear lands on a large scale on first arrival, it rarely succeeds so well; for the price of labour is so high, and the difficulty of getting persons to work, added to the great expense of providing food for increased numbers, until produced from your own land, ought in every instance to induce caution in laying out money; but a crop of potatoes, with fodder for a cow, is the first object, and this may be accomplished the first year, if you arrive early. The second you will be enabled to supply your family with the necessaries of life from your own grounds; and the third year you may find yourself possessed of a yoke of oxen, a cow or two, and a year-old calf, a couple of pigs, poultry, &c., abundance of provisions for your family, and fodder for your cattle. The Irish and Scotch peasantry know well how to value the economy of a milch cow; every new settler ought to strive to obtain one as soon as possible, taking care to provide a sufficiency of fodder for the long winter. Cattle require a little salt in the Canadas. It is not considered necessary to go farther into the details of the first settlement, as on all these points you will be guided by your own observations on the spot, and the advice you will get from the local agents and superintendents.

ACCOUNTS GIVEN OF THESE COUNTRIES BY SETTLERS.

We quote the following letter from Upper Canada, from the United Service Journal:—

"Dear ——, You wish me to give you some account of Canada, and I will endeavour to do so; and if the little that I have to say on the subject does not tend to instruct, it will, I hope, serve to amuse you, and enable you to form correct ideas of this remote but interesting corner of the world. I may not possess extensive information upon every subject connected with Canadian affairs, nor do I wish to tire you with lengthened or studied details. Having resided many years in Upper Canada, and circumstances having obliged me to consider it my adopted country and home, I have grown imperceptibly attached to the rough life of a woodsman; but I will endeavour to divest myself of prejudice, and hope to be able to present you with a plain unembellished account.

"Emigrants coming to Canada generally entertain very erroneous opinions; their information having been collected from the writings of people who have little knowledge of the country, or are governed by interested motives: they come full of romantic whimsical notions, but perfectly ignorant of the country they are about to inhabit, and of the trials that await them. On their arrival, they ought to abstain from eating new potatoes, green peas, unripe fruit, &c., or use them in moderation; for many, on their first arrival, are afflicted with dysentery, which, I am confident, is occasioned by the greediness with which they devour vegetables of every kind, after being confined for a few weeks to the use of salt provisions. Fever and ague are common complaints all over America [in low and swampy localities, not in high and well-drained grounds], but seldom prove fatal. They generally make their appearance in new settlements in four or five years after we have commenced clearing land, rage for one or two years, and then almost wholly disappear. They are probably to be attributed to the foul vapours arising from the decayed stumps and roots of trees and other vegetable substances. Intermittent and other fevers are common in the neighbourhood of large marshes and stagnant ponds. Emigrants ought to avoid such places.

"About sixteen years ago a number of families came from Glasgow and its neighbourhood. They were assisted by government, and settled in the district of Bathurst. They were moral and industrious, and an acquisition to the country; but such was the bad quality of the land selected for them, that many of them, after struggling for years, abandoned their farms, and removed to other places. Clearing land is laborious work. The first thing we do is to underbrush it; that is, cut the young trees and bushes close to the ground, and put them together in large heaps. The best time for underbrushing is when the leaves are on, or before the snow falls; for when the snow is on the ground, we cannot conveniently cut the bushes low; we then cut the trees down. The small branches are thrown upon the brush heaps, and the trunks are cut into logs of about twelve feet each: good straight logs of oak, ash, cedar, and some other kinds, are reserved to be converted into rails. The cutting of the timber is called chopping, and is mostly performed in the winter, as we have then most leisure: when the brush heaps are sufficiently dry, they are set on fire. Logging next commences.

"Wolves are numerous, and are very destructive to sheep, and occasionally to young cattle. I have heard of their attacking travellers; but upon inquiring into these reports, have always found them mere fabrications, though I know two instances when travellers on horseback have seen wolves in the middle of the road, and after trying in vain to frighten them away, or urge their horses forward, have been obliged to turn back. I have met them when travelling alone and unarmed through the woods, but never was even menaced by them. In winter, when oppressed with hunger, they are most dangerous. The wild-cat, or cat-a-mount, in figure bears a strong resemblance to the domestic cat, except in its tail, which is not above two inches in length, and tipped with black, as are also the ears; it is of the same colour as the wolf, and appears to be quite as large and powerful, though shorter in the legs: they climb to the tops of the tallest trees with facility, and are said to be very fierce: they destroy sheep and other domestic animals. We have also beavers, racoons, martens, and many other animals. Our woods abound with deer, hares, partridges, pigeons, and many other kinds of game. There are a great variety of ducks in our rivers and marshes; and here, in the western district, we have wild turkeys and quails; our rivers and lakes are equally well supplied with fish."

This letter goes on to describe a number of snakes which are found in Canada, such as the water-snakes which some suppose to be venomous; two kinds of rattlesnakes, which are both very dangerous: there are also garter snakes, copper-head snakes, and blowing adders. These reptiles are only to be found in particular districts, and with common precautions little danger may be expected from them.

The following letters are from a gentleman who settled about a hundred miles west from Toronto. He says—"I am installed in about 800 acres of clergy reserves and Canada Company's lands contiguous, and am in treaty for 800 more from private individuals, which, one with another, will cost fifteen shillings currency per acre. The land, besides being bounded by the River Thames, is watered at every half mile by streams running into it, the springs giving the purest water; the land slopes down to the south; and, altogether, is calculated to create satisfaction. I have set people to work, to chop, clear, burn, and fit the land in every respect for sowing, for eleven dollars an acre, or £2, 15s. The fencing will cost me at the outside two dollars more per acre, and sowing one dollar and a half, making in all £3, 12s. 6d. My log-house, 34 by 22, and two stories, will give me six good rooms at least for roughing in, and will cost me at the outside, to make it comfortable, not more than £50. In this my friend and I will live during the winter, and until I get things prepared for building. We have every thing as comfortable and good to eat as the most reasonable man could wish; and barring pawter spoons for silver, horn-handled knives for

ivory, our table would not blush to stand alongside one at home. I have made three trips to Toronto since our location, and bought a load of things each time. I must make three trips more, most likely before winter, to complete stores, pick up labourers, and arrange for land. Well, with the whole of this hard work, much hard desling, thought, and calculation, I grow more and more enthusiastic in favour of the country. Our climate is delightful, and our neighbourhood excellent and obliging. *I would not for twenty thousand pounds return to Scotland.* I want not money, but to lead a useful life. Now, Alexander, if you want to buy land for your boys, do it immediately." Here the writer enters into private details, so we pass on to his next letter. After giving some further account of his operations, he thus proceeds to speak of his toils:—"Riding fourteen miles to get lumber or sawn timber drawn, to ride to measure every cart-load myself, and to do at least one-half of what one at home would find people trustworthy enough to do for him, you will not wonder that the toils of a beginning are as numerous as they are weighty. However, I like the life amazingly. I find at all events some scope for my mind; and if there be difficulties to surmount, there is no little pleasure in overcoming them, and still greater in feeling one's self equal to it. I have just been buying a hundred bushels of oats at 11½d. a bushel, so you know what oats may be had for; excellent apples 7½d. per bushel; wheat is high this year—that is, a dollar a bushel; and butcher meat for 2½d. and 3d. per lb.; potatoes the same price as oats."

In another letter he says—"Since my last, I have removed to my new residence; and although, as I said before, I have to break my neck to get a view of the heavens overhead, get the cramp in my fingers from milking the cow in these cold mornings, follow the trail of my oxen when they stray, and be alternately plasterer, glazier, slater, delver, and chopper, so that my hands have become as hard as elm, and their shape like bullock's lights, with Bologna sausages for fingers—I am, for all this, as pleased as Punch, and even get fat on it. Indeed, I may say, I have been indefatigable since my adoption of my new calling; so that, if I don't succeed in establishing some degree of order, and management, and evidence of prosperity, 'twill neither be for want of activity, decision, good humour, nor system." It is clear that this is the sort of person for a Canadian life. Again, in January, 1834, he says—"I rise every morning at five o'clock, and awake the household; and while the servants are managing the breakfast, so as to get all comfortably over by daylight, I light the fire in our room, for I exact no service not absolutely necessary. I don't mean what you call *necessary* at home, but things of far lower estimate. My shoes, for instance, which are somewhat of the thickest, are well greased twice a week, instead of being blackened, which is very well for walking the streets, but of wondrous little use here. I have cut down twenty acres since my last, and am continuing the good work. We muster in all seven axes, and get through about an acre a day; but as other matters interfere to take off my hands, I find I cannot average more than about twelve acres a month. I see by my account with the bank that they have credited me with———; and as money currency goes as far here as money sterling does in England, I calculate I am a gainer of rather more than a fifth by the transfer. That, with the high rate of interest, the cheapness of living, and exemption from taxes, makes me at least three times as rich a man as I was at home."

By the next letter, we find the writer equally pleased with the country both as to soil and climate, and also for its healthiness. He had now a good deal cleared, and was burning off his timber from twenty-five acres for spring crop. He had rented all that he had cleared to a farmer from Scotland for a third of the crop, and was gradually acquiring the means of a lasting independence, along with all the attributes of rural wealth and comfort It has been said that gentlemen should not emigrate to Canada—that it is a country only for working people but this idea is quite fallacious. The present is but one of many hundreds of gentlemen who, during all their lives before, had never soiled their fingers with labour and yet we see what is the result. We venture to say that Mr. R. is as active, and puts his hands to as much dirty and hard work, as would be the case with a person bred to rough country labour; while his education and intelligence lead him into the most advantageous course of operations.

Those who cannot immediately purchase land in Canada, sometimes put in grain along with that of any neighbouring farmer, and receive a share of the crop. "This being the case with me this year," says a writer of a letter dated January, 1834, "one of my neighbours puts in two fields with me—one of rye, of which he does all the work except half the harvesting, affords half the seed, and gets half the crop: another of peas, of which he does all the work, affords all the seed, and gets two-thirds of the crop."

We quote the following from a letter written by a settler in the township of Nichol, Upper Canada, to a friend in Scotland, and which appeared in the Aberdeen Herald:—

"From the experience of myself and friends, I give my plain candid opinion on this matter, when I say to the emigrant newly come among us, beware of attempting to clear more than you have a rational prospect of finishing in time for the season of sowing or planting Two acres well cleared are worth five acres indifferently finished; and if you can set about it by the first or second week in July, you may get two acres nearly ready to receive fall wheat. Should you attempt seven acres, unless you have a strong force and plenty of dollars, it is ten to one but you will fail of being ready in time; and if the spring be as backward as I have seen it, you would be too late for cropping them. Now, if you can get two or two and a half acres sown with fall wheat the first autumn you are in the woods, and get half an acre cleared for potatoes by the 15th or 20th of May, which may be quite practicable, and perhaps another half acre cleared for turnips by the 20th of June, I maintain there is a rational prospect of your eating the produce of your own farm during the second year of your settlement, and have as much as bring you to the next crop; but bear in mind, that during the first year you must buy in your provisions, or work for them. Go on clearing for fall wheat during the summer, and perhaps you may get four or five acres ready by the second autumn; and if you can get the stubble burned off when your first crop of fall wheat grows, by the 20th or 25th of May next year you may get in a crop of barley without ploughing, and timothy-grass seed grown along with it, to give you a crop of hay during the third year. If you can get another acre or so cleared for potatoes, you will have some of them to dispose of after supplying yourself; and where turnips and potatoes grew the previous year, you may get spring wheat or oats sown the next. This may be a rational prospect of the fruits of your industry at the end of your third autumn or second harvest, and thus you may begin to feel yourself in a thriving way. This, however, brings me to speak upon the next matter for the emigrant's consideration—live-stock. If he can possibly afford it, he must endeavour to procure a cow to begin the world with. During the summer months a cow gets her meat in the forest without costing the owner a farthing for keep; and for the other six months straw and turnips will be advantageous; but tops of trees, felled down for the purpose, seem to be the food they are instinctively inclined to prefer. The last of course costs the farmer the trouble of chopping them down; but as

he may be engaged doing so for the purpose of clearing, he thus 'kills two dogs with one bone.' Clearing can scarcely be carried on without the assistance of a yoke of oxen; but unless the emigrant can buy food for them, I would not recommend him to purchase these during the first autumn, but rather hire a man and a yoke to assist him when and where necessary; and he may have some more encouragement to buy a yoke during the following year, with the prospect of having some food growing for them. You will understand that I have been writing about the *bush farming*, as it is called, and taking it for granted that I am addressing an intending emigrant who is possessed of a moderate supply of money. In fact, supposing he had a considerable amount with him, still he will be nothing the worse for adopting the plan I have laid down. Were it possible to get a small cleared farm to commence upon, it would perhaps be more advantageous to the emigrant.

"I now finish my letter by giving my opinion on the subject as a whole. If a man have firmness, patience, and fortitude, combined with perseverance and prudence, he will in the course of a few years be quite comfortable—I might say independent—even supposing he set himself down in the bush at a considerable distance from neighbours; but if he could get the chance of a farm with four or five acres cleared upon it, I would recommend him to fix upon such in preference to one completely wild, unless he is careless of what sort of neighbours he may be likely to have about him."

Another letter, dated from Fort Erie, says—"Wheat is selling here for 5s. per bushel; oats, 1s. 3d. per bushel; butter, 6d. per lb.; eggs, 6d. per dozen; beef, 2½d. to 3d. per lb. Servant's wages, £2 to £2, 10s. per month, with board. Tea, 3s. per lb.; green tea, 4s. 6d. Potatoes are selling at 1s. per bushel; 350 bushels constitute an average crop per acre.

"A farmer can settle here in style with £500, and keep as good a table as any of our lairds; but of course must attend to his business and keep at home, as servants here are much less to be depended on than they are in Scotland. I have seen a few persons in the ague, but they seem to think little about it; those on Lake Erie are more liable to it than those on the lower lake."

Extract from a letter dated Sandwich, Western District, Upper Canada, which appeared in the Inverness Courier:—

"In this district, after mature consideration, I have finally settled. Having at a very early period been colonized by the French, and since that time vastly improved by numerous proprietary, it has all the commercial advantages of the mother country, with infinitely greater capabilities of supplying the raw materials. The fertility of our soil is even here proverbial, and our produce superior in quality; so much so, that our wheat is uniformly a shilling ahead of any other. Along the sides of the isthmus on which we are planted (for, with the Lake St. Clair on the one hand, and Erie on the other, it almost is such) there is ready and cheap conveyance by steam; while the Thames, a noble and majestic stream that intersects the interior, opens up the inland parts. Not even a tree is felled in the remotest parts of the country but may be conveyed by water to market. That of Detroit, on the American side, is flocked to from all parts of the Union and of the British possessions; and, both from the numbers that attend, and the quality of the articles produced, is among the best in the country. There is abundance of woodcocks, snipes, and deer, in the district.

"But what chiefly fixed my determination was the salubrity of the climate, which, compared with that of Lower Canada, and most parts of Upper, is immeasurably superior.

"We have abundance of room for settlers. Were you to sail down the Thames, for instance, and see the country along its banks studded with cultivated farms and closely shaded behind with the 'tall trees of nature's growth,' waving their majestic foliage to the breeze of heaven, and seeming to court the hand of man to remove them from the situations in which they have so long flourished untouched; were you to meet the steamboats as they ply their course upwards—their decks crowded with emigrants, driven perhaps from the land of their fathers, and now come to seek a home 'beyond the western wave,' you would, as I have often done, heave a sigh for the wretchedness in other climes that here might be relieved—for the starving inmates of many a hovel that here might have 'plenty and to spare.'"

Extract of a letter from a mill-wright who left Aberdeen for Zorra, Upper Canada, in 1832, to his friends in Scotland:—"This is a salubrious climate: nothing beyond some trifling ailments has, ever since we came here, been the matter with any of us. This is a mercy for which we ought to feel thankful, for many of the first settlers were deeply afflicted with fever and ague for nine, ten, or twelve months, during which time they were unable to do any thing for themselves. I have purchased a farm of about 100 acres, and have got some little stock upon it: we have got two cows, a yoke of oxen, and a year-old steer, three sheep, and a nog. Our cows have been very useful, the one gives us milk in summer, the other supplies us pretty well in winter: our oxen, with a wagon, we got the other day. With such a stock on a farm of 100 acres, with about thirty acres cleared, we get on very comfortably. In a new settlement as this is, far removed from market, it is no easy matter to raise money; but in this respect there is a prospect of improvement. Now, as to the important question, shall I advise you to follow us? Were I to consult merely my own feelings and comfort, I should say without hesitation—*come, come every one of you*—come as soon as possible. Here, with hard labour and industry, after three or four years, you might find yourself in possession of a piece of land, at least fifty acres, which you could call your own; also a yoke of oxen, and cows, &c. upon it, besides other property. Judge if such can be the case where you are. But it cannot be concealed that there are difficulties to encounter, and privations to be endured, which every one has not resolution to face or patience to bear; *these especially occur to those who have little or nothing to commence with.* Our winter has as yet been just such as yours—very moderate. For some time we had the frost perhaps rather more intense than you ever have it, but it has had no durability; it has been, however, easier than usual, and the former was as much severer. The heat of the last summer was fully greater and of longer continuance than usual; and I may say that I have felt neither the heat of summer nor the cold of winter at all insufferable; nay, though both have been stronger than in Scotland, I have felt both more disagreeable there, however it may be accounted for. We have had several slight storms, but none of them has lasted above a week or two. Our cattle here live in summer by ranging the woods; in winter, if scarce of fodder, we can bring them through by chopping down the maple, on the tops of which they seem to fare sumptuously. Making sugar from the maple-tree is here a principal source of gain to the settler. The sugar season begins generally about the middle of March, and lasts about a month. Some will make from ten to twelve cwt. in a season, which can be sold for about £2 per cwt—a good deal of which, however, must generally be taken in goods. Two months hence, we expect to be able to tell you more about it, as we intend to make the most we can of it. It would be desirable if you could send or bring some seeds—an English pint of good potato oats, barley, a few seeds of the best kinds of potato, some yellow turnip-seeds, early carrots, onions, caraway seed, some greens and cabbage seeds, and a few roots of

strawberries. We have wild gooseberries in the woods, but no garden gooseberries. Some of them you could bring if you come yourself, the others could be packed in a small box."

Extract of a letter from a gardener who left Aberdeenshire in 1834, to a friend there:—"I got into a very good situation as soon as I arrived in Montreal. I am engaged for one year. My wages are not so high as I expect they will be when I become better acquainted with the climate of the country. Just now I have £40 per annum, and bed, board, and washing. I have three acres of a garden, along with ten acres of apple orchard, to take charge of, and am assisted by two labourers who are constantly with me. The garden is surrounded by high brick walls, covered with peach and nectarine trees. The peaches here grow to a great size, and ripen excellently in the open air. The grapes bear well on trellises in the garden. I had a fine crop of these, superior to any I ever saw in the houses at home; and the melons are also surpassingly fine. I cut 300 of very fine melons from a small piece of ground not more than 20 feet by 12. Some of them weighed 15 lbs., and most of them from 6 to 7 lbs. They require no attention here whatever. Just sow the seed in the open garden, and keep them clear of weeds, and this is all you have to do. We do not think it worth while to give cucumbers garden-room; we sow them about the ditch-sides in the fields, and they produce most abundantly. Gourds come to a great size, some of them weighing 50 lbs. You will not be surprised that we can grow all these things in the open air, when I inform you what degree of heat we have for three months here during the summer. The thermometer stood for three months at 99 degrees all day in the shade, and 86 all night. I thought I would be roasted alive, being obliged to take my bed out of the house, and lie in an open shed, with nothing on but a single sheet; and after all I perspired very freely. The weather is cooler now, and they tell me that winter will soon be on, and continue for six months, during which all outdoor work will be suspended. Wheaten bread is very cheap: you can buy a loaf that will weigh 6 lbs. for 8d. Vegetables sell very high in the market: a good cauliflower will bring 8d.; a cabbage 4d. Potatoes, 2s. 6d. per bushel. Barley, 3s. 6d. per bushel. Beef sells at 5d. per lb. Pork, 6d. per lb. Mutton, 3½d. per lb. Eggs, 5d. per dozen. We can grow no rye-grass here. Our hay is all made of timothy-grass. We cut it in the morning, and it is ready to be put into the barn in the afternoon.

"I would advise no person to come here but such as are able and willing to work; for I can assure you this is no place for idlers. Labouring men's wages in this town are 2s. 6d. currency per day; joiners, 5s. per day; masons, the same; tailors, 7s. 6d. per day; blacksmiths, 5s. 6d. per day. Clothes are remarkably high here. Thirty shillings is charged for making and mounting a dress coat; six shillings for making a pair of trousers. Shoes much about the same price as in Scotland, but not so good."

Extract of a letter from a farmer who left the parish of St. Fergus in the summer of 1834, and settled in the township of Whitby, Upper Canada:—"With the advice of Mr. D—— and Mr. S——, I bought my present farm, which I shall now give you some account of. I have ninety acres of good land, seventy of which are cleared; and on thirty acres of this there never was any stone, and but few stumps to clear off—perhaps not above forty on each acre. About twenty acres are altogether clear of them, and I think I will have the whole cleared this season. I have a good orchard, containing about 200 trees, one-half of which are in full bearing, and the other half planted last year. The barn is good, but the dwelling-house rather indifferent. There are three log-houses on the place, two of which let at £6 each per annum. I have bought a pair of oxen, which cost me 70 dollars, and two cows, one of which cost £3, 10s., and the other £4, 10s. currency. The cattle here are very good: I never expected that I should see such in America. The horses are excellent, and although of the blood kind, can endure a great deal of fatigue. I had almost forgotten to tell you the price of my farm. It cost me £400 sterling. You may think this a very high price, but you cannot get woodland here under 8 dollars an acre, and it costs 12 dollars to clear and fence it. If a man can buy a cleared farm at £5 per acre, or £5, 10s., he is much better, if he has the money, than to go into the woods. I have ten acres of summer fallow ready to sow down with wheat; four acres of potato land; four acres where there was Indian corn, which I think I shall have ready to sow down in the course of ten days. I will sow the rest with spring crop, say oats and peas. I fear nothing in this country save the heat in summer; but I have been told, if I stand out this summer, I need not be afraid, as the oldest man in the place does not recollect such a warm season. We are at the same distance from church as we were at Cairnhill, and have two schools within two hundred yards of the door. A blacksmith and wright, a saw-mill and brick-work, are all about the same distance. A person here can have every thing as in the old country, if he has money. Wheat is very cheap. The best does not bring more than 3s. 6d. per bushel; but it is expected to rise very soon. The crop of it was excellent this year, as was also the Indian corn. If any of my old neighbours think of coming here, they need not fear of getting a farm, as there are always plenty to sell."

CONCLUSION.

Very little remains now to be said regarding these colonies. In our opinion, the question of emigration is one of a very simple nature, and may easily be solved by every thinking person. We have proved beyond the possibility of doubt, that British America is a country placed in infinitely better circumstances at the present moment than any part of Great Britain and Ireland. We have shown that, in most places, the climate is delightful, and the lands fertile. It is not denied that in many portions of the colonies agues and other local diseases prevail; but it admits of demonstration, that on the whole they are as healthy as these islands. If the inhabitants of the low uncleared lands in North America be liable to agues and fevers, those of this country are, on the other hand, continually liable to colds and consumptions to a degree fully as dangerous; indeed the *colds* of the island of Great Britain seem to rank as the most destructive of the diseases which affect mankind. Besides, every year the continent of America, as it becomes cleared, is becoming more salubrious, and it certainly possesses extensive tracts of land already fully as healthy and pleasant as any part of England. If it be established that British America is that fertile and promising territory which it is represented to be, the whole of the question of emigration resolves itself into this: are men who are in difficulties in this country willing to undergo the trouble of removing thither, and of exerting themselves for a few years after they arrive? As for the notion which obtains as to the pain of parting with early friends and the place of our birth, that we take to be entirely fallacious. It is the duty of every man to go where his mental and physical properties can be most advantageously exercised. It is a fundamental law of human nature, that mankind must disperse themselves over the whole earth, to seek out the best means of subsistence and the most agreeable spot for their residence. Had intending emigrants to proceed to a land of barbarians, where neither human nor divine laws were understood or acted upon, and where they had to settle on sterile deserts or burning

wildernesses, we might excuse their hesitation to depart from their native country; but the case is quite different. To emigrate to Canada, or any other British colony, is simply to remove, as it were, to another part of Great Britain. Distance is nothing; for the removal of a family from the north of Scotland to the south of England would be attended with nearly the same trouble and expense; and in each case the family would find itself surrounded with neighbours equally strange. But to emigrate to Upper Canada with the means of purchasing a tract of land, holds out a much better prospect than to remove from one part of Great Britain to another. In this country it now requires a very great mental and physical effort to obtain a comfortable subsistence. Nearly the whole of the lands and manufactures in the United Kingdom are passing into the hands of capitalists. The rich are becoming very rich, and the poor are sinking deeper and deeper into poverty and wretchedness. The small farmers and tradesmen of England, Scotland, and Ireland, are now placed in that peculiar condition, when emigration to a country less occupied and overdone than their own, is almost imperative; for, looking around on all sides, they see little chance of rising into better circumstances, or of rearing their families in that comfortable and reputable manner which their feelings dictate. To such, therefore, British America offers a fair field for removal and settlement. In these countries lands can be had in full possession at an expense of from fifteen to twenty times less than what is paid here by way of annual rent; and it is seen that in a space of from three to five years, the whole cost may be realized by the amount of the produce. In these colonies, moreover, there are no taxes; at least they are so very trifling, that they are not worthy of being classed as taxes. There are also no poor-rates, and no tithes, both of which imposts are severely felt in England. The emigrant will likewise have nothing to annoy him in a political sense; for in Canada he continues to be a British subject, and can claim all the prerogatives of such a distinction.

In short, it appears to us that, excepting the drawbacks attending the *first difficulties*, there is no substantial obstacle to a very considerable improvement of circumstances. But we entreat all who have any confidence in our advice, not to imagine that these difficulties will be trifling. They will be, on the contrary, of a very serious nature. Let all remember, that they will see a country consisting of extensive dreary forests, interspersed with settlements on the rudest scale; that the roads are generally in a very bad condition; that the cold of winter far exceeds what is generally experienced in Britain; that many of the conveniences of civilized life can with great difficulty be obtained; and, above all, that every one *must work hard with his own hands*. We tell all most distinctly, that these things will be seen and experienced; and that a great deal will in all likelihood be suffered for some years. Having, however, by patience and enterprise, got over the early difficulties, the settler will unquestionably possess a competence, along with the blessing of mental tranquillity, and be relieved of all fears respecting the rearing of his family in a state of decent independence.

EMIGRATION TO THE UNITED STATES.

The United States now occupy the largest portion of the North American continent, and offer a boundless field for the settlement of emigrants. Originally confined to the territory along the shore of the Atlantic, this great republic has extended its influence and power over nearly the whole of the regions spreading westward to the Pacific. This vast territory, surpassing in internal resources, and nearly in dimensions, any of the empires of the Old World, extends from the 25th to the 49th degree of north latitude, and from the 67th to the 124th degree of west longitude. It measures in extreme length, from the Pacific Ocean to the Atlantic, 2780 miles, and its greatest breadth is estimated at 1300 miles.

The United States consist of three great natural divisions—the slope from the range of the Alleghany mountains to the Atlantic, comprehending the oldest settlements; the valley of the Mississippi, now in the middle of settlement; and the slope from the Rocky or Chippewa Mountains towards the Pacific, which is still in a wild wilderness condition, and inhabited by Indians. The great wonder of this immense country is the valley of the Mississippi, which is considered the largest division of the globe over which the waters pass into one estuary. The Atlantic slope contains 390,000 square miles, the Pacific slope about 300,000; but this great central valley contains at least 1,300,000 square miles, or four times as much land as the whole of England. The valley of the Mississippi, into which the flood of emigration to the states is chiefly directed, is divided into two portions, the upper and lower valley, distinguished by particular features, and separated by an imaginary intersecting line at the place where the Ohio pours its waters into the Mississippi. This large river has many tributaries of considerate proportions besides the Ohio. The chief is the Missouri, which, indeed, is the main stream, for it is not only longer and larger, but drains a great extent of country. Its length is computed at 1870 miles, and its particular course 3000 miles. In its appearance it is turbid, violent, and rapid, while the Mississippi, above

junction with the Missouri, is clear, with a gentle current. At St. Charles, twenty miles from its entrance into the Mississippi, the Missouri measures from five to six hundred yards across, though its depth is only a few fathoms.

The Mississippi-proper takes its rise in Cedar Lake, in the 47th degree of north latitude. From this to the Falls of St. Anthony, a distance of five hundred miles, it runs in a devious course, first south-east, then south-west, and, finally, south-east again; which last it continues, without much deviation, till it reaches the Missouri, the waters of which strike it at right angles, and throw the current of the Mississippi entirely upon the eastern side. The prominent branch of the Upper Mississippi is the St. Peter's, which rises in the great prairies in the north-west, and enters the parent stream a little below the Falls of St. Anthony. The Kaskaskia next joins it, after a course of 200 miles. In the 36th degree of north latitude, the Ohio (formed by the junction of the Alleghany and Monongahela) pours in its tribute, after pursuing a course of 750 miles, and draining about 200,000 square miles of country. A little below the 34th degree, the White River enters, after a course of more than 1000 miles. Thirty miles below that, the Arkansas, bringing in its tribute from the confines of Mexico, pours in its waters. Its last great tributary is Red River, a stream taking its rise in the Mexican dominions, and flowing a course of more than 2000 miles.

Hitherto the waters in the wide regions of the west have been congregating to one point. The Mississippi is now upwards of a mile in width, and several fathoms deep. During its annual floods, it overflows its banks below the mouth of the Ohio, and sometimes extends thirty and forty miles into the interior, laying the prairies, bottoms, swamps, and other low grounds, under water for a season. After receiving Red River, this large stream is unable to continue in one channel; it parts into separate courses, and finds its way to the ocean or the Gulf of Mexico, at different and distant points below New Orleans.

The capabilities of the Mississippi for purposes of trade are almost beyond calculation, and are hardly yet developed. For thousands of years this magnificent American river rolled its placid and undisturbed waters amidst widely spreading forests, rich green prairies, and swelling mountain scenery, ornamented with the ever-varying tints of nature in its wildest mood, unnoticed save by the wandering savage of the west, or the animals which browse upon its banks. At length it came under the observation of civilized men, and now has begun to contribute to their wants and wishes. Every part of the vast region, irrigated by the main stream and its tributaries, can be penetrated by steamboats and other water craft; nor is there a spot in all this wide territory, excepting a small district in the plains of Upper Missouri, that is more than one hundred miles from some navigable water. A boat may take in its lading on the banks of the Chataqua Lake, in the state of New York, within a short distance of the eastern shore of Lake Erie—another may receive its cargo in the interior of Virginia—a third may start from the Rice Lakes at the head of the Mississippi—and a fourth may come laden with furs from the Chippewa Mountains, 2800 miles up the Missouri—and all meet at the mouth of the Ohio, and proceed in company to the ocean.

Those whom we are now addressing probably inhabit the island of Great Britain, where the traffic of every sea-port, every branch of inland navigation, has been pushed to its utmost limits, where every art is overdone, and where the heart of the ingenious almost sinks within them for want of scope for their enterprise. But here, in this wide-spread ramification of navigable streams, there is an endless, a boundless field for agricultural and mercantile adventure Within the last twenty-four years, the Mississippi, with the Ohio, and its other large tributaries, have been covered with steamboats and barges of every kind, and populous cities have sprung up on their banks. There are now *sea*-ports at the centre of the American continent—trading towns, each already doing more business than some half-dozen celebrated ports in the Old World, with all the protection which restrictive enactments and traditional importance can confer upon them. The valley of the Mississippi, one of the greatest natural wonders of the world, will one day possess and comfortably sustain a population nearly as great as that of all Europe.

Such are the great natural divisions of the United States. Usually the country is divided into what are termed the Northern and Southern, or Free and Slave-holding States, in which the climate and habits of the people differ very considerably. It is chiefly, and almost entirely, to the northern or free states that the attention of emigrants should be directed, because such persons will there have at once a temperate climate, more agreeable to their constitutions, and a greater scope for their industry in agricultural and mechanical employments. The Southern or Slave states afford no place for any except those who have capital to purchase both land and slaves; and the soil and temperature, besides, are adapted chiefly to the culture of tobacco, cotton, indigo, rice, and other tropical productions, in raising and preparing which the people of this country have no experience. Texas, a country on the south of the States, in which slavery is tolerated, lately forming part of Mexico, possesses also, we fear, too tropical a climate for the comfortable settlement of emigrants from Britain.*

EMIGRATION.

When the determination is once taken to emigrate, the next step is to make arrangements with a ship-owner, or captain, for the voyage. A passage may be taken either to Philadelphia, Baltimore, or New York, with almost equal advantage: Philadelphia or New York are perhaps preferable. The charge for passage from Leith to New York, in the steerage, is £3, 10s. to £4; children from 7 to 14 years, one-half; under 7, one-third; under 12 months, no charge: passengers find their own provisions. The ship lays in water, firewood, or coals, cooking apparatus, and fits up sleeping berths. One-third of the freight to be paid before the passage be secured, and the remaining two-thirds on sailing. Cabin passage, £14 to £15; children, £10. The line of packet ships which sail at stated periods from Liverpool and Greenock for New York, Philadelphia, and other ports in America, are as desirable vessels as could be wished for taking a passage in. They are of large tonnage; and being fitted up for carrying both passengers and goods, emigrants may expect greater comfort than in common sailing vessels.

Supposing the emigrant landed at Philadelphia, New York, or Baltimore, his next step, if a tradesman, is to consider where he is most likely to find work. Except shipwrights and one or two other trades, it is perhaps better to proceed to some of the considerable inland towns, where wages are generally higher and the cost of living less. On this subject, the emigrant will find ready information from people of his own business in whatever city he may land: they are seldom unwilling to put strangers in the way of finding employment. There is an emigrant society in Philadelphia, which has done a great deal for this purpose.

If the emigrant wishes to purchase land, and has fixed on the district where he intends to settle, he ought to take his passage accordingly to the port which is nearest to his intended destination. If he means to purchase a farm in the settled districts of New York, such as those in the valley of the Hudson, or about the lakes of the

* For a complete account of the United States we refer to the article on the subject.

River Mohawk, Genessee, &c., he should sail immediately for New York. The same port is the fittest for those who mean to proceed to Michigan; but these may also go by Montreal, whence the Rideau Canal, now opened, affords an easy passage to Kingston, instead of a disagreeable route by the rapids of the St. Lawrence, formerly followed, and which made emigrants generally prefer going, even to our own settlements, by New York, instead of Montreal. The passage by the canal, now opened, from that place to Kingston, costs 9s. 4d., with one trunk; other luggage must be paid for. Supposing the emigrant at Kingston, he will find a direct passage to Michigan by proceeding up Lake Ontario, and then through the Welland Canal, whence he will go up Lake Erie to Detroit. If he goes by New York, he proceeds up the River Hudson, thence along the Erie Canal to Buffalo, and next to Detroit by the Lake. By New York, the expense of the whole passage may be reckoned: passage to New York (in the steerage), £3, 15s.; to Albany on the Hudson, 9s. 6d.; to Buffalo, £2, 2s.; to Detroit, 9s.; the whole amounting to £6, 15s. 6d. If there be considerable luggage, it will, of course, add to the expense; but £7, 10s. will cover it in general. By Montreal, and the facility now afforded by the Rideau Canal, the expense will be somewhat less. The numerous railroads now existing in America leave the emigrant a choice of the means of conveyance. From all the large towns in the States he will find railroads proceeding either into the interior, where they meet other railroads or canals, or to some town on the banks of the large rivers, from whence steamboats are constantly sailing.

We have not received intelligence of the completion and opening of the canal which is in progress from Lake Erie by Columbus and Chillicothe to Portsmouth in Indiana, so that it will be necessary for travellers who think of proceeding to any of the western countries, to journey partly by road, and partly by canal, to Pittsburg, and thence down the Ohio. This they can do either from Baltimore or Philadelphia.

Emigrants who intend to settle in the highlands of Pennsylvania, had better take passage immediately to Philadelphia, which will be the cheapest; but if that be impossible, as ships are not always to be found for the desired port, the journey either from New York or Baltimore to that place is short, and not expensive. Readers may see it mentioned in our notice concerning the Expenses of Travelling.

After landing, emigrants ought to make no delay in lingering about the sea-ports, either from curiosity or the persuasion of fellow-passengers. Let them immediately proceed to business. If in search of land in Ohio or Michigan, let them instantly set out thither; they will find a land-office in every principal town of the districts, where they may look at the surveys, learn what townships or lots remain unsold, and get such information as the surveyor possesses concerning their qualities. But in every case let the settler examine and search for himself; no one else can or will judge for him. The surveys are made out, delineating the lines of the most considerable rivers and hills; and they are covered over with a number of small squares, like checks, which represent the different townships of six miles square, sections of one mile, and quarter sections. There are some principal lines marking larger squares; these are the meridians and base lines, by which the positions of the smaller portions are fixed, according to their distance from each. No smaller quantity is sold than 80 acres; and the price of government land is everywhere the same, that is, one dollar and a quarter per acre, or 5s. 9d.—though emigrants cannot always reckon on getting a situation to fit them at that price; perhaps four to eight dollars may procure a choice.

Should the settler wish to have land in Pennsylvania or New York states, it is to be bought there from individuals, the government having no land for sale in these states. The price here varies according as the land is improved or not; and on this subject the reader will find information under the head Prices of Land. If the emigrant should not, immediately on landing, find any one who has land to sell, an advertisement inserted in any of the papers will bring some of the owners or their agents to wait on him, and to direct him concerning purchases to be examined. His family should remain in New York or Philadelphia till he sees the land and fixes on a situation.

Emigrants, on landing, are advised to lodge their money in some of the banks. If they have any considerable sum in gold, they can generally dispose of it to advantage to the brokers; but it is better, in the meanwhile, to place it in bank as a *special deposit*, taking a receipt from the cashier, bearing that he will return *the same* to you or your order. The proceeds, after exchanging your gold, may be left in the bank, from which you will receive a book giving you credit for your deposit; and you may then draw upon the bank as you need the money.

To those who wish full information on the subject of America, we would recommend the splendid work lately published by J. Howard Hinton, Esq., which contains every thing relating to the history, natural capabilities, and statistics of the country. The recent work of our countryman, Mr. Stuart of Dunearn, is well worthy of attention, from its accuracy and impartiality. The volume of Mr. Fergusson of Woodhill is full of interest to agricultural emigrants. Other works may be perused with advantage—Flint's Letters from America, Duncan's Travels, Shirreff's Tour in North America, &c.

DISTRICTS FOR EMIGRANTS.

Three districts are pointed out as highly worthy of consideration by emigrants. These are—1st, The highlands of Pennsylvania; 2d, The countries in the valley of the Mississippi; and 3d, The district of Michigan.

Pennsylvania.—The highlands of Pennsylvania form a fertile and healthy country, situated to the north-west, between Philadelphia and Pittsburg. It lies in the middle of the settled districts, and has hitherto never been occupied by a population, from the circumstance that there were no roads or channels of carriage open between it and the large towns and rivers; so that the settlers, whatever might be their produce, had no means of sending it to market. From the mountainous nature of the ground, it was long before lines of communication to the requisite extent could be carried through it; this has now, however, been effected, so that the whole resources of the district are at length laid open to cultivation and industry. Coals, lime, and iron-ore, are here found abundantly, and canals or railroads have been formed to the mines. The lands in the valleys and sides of the lower ranges of hills are of great fertility; and from the mildness of the climate, some of the mountains admit of cultivation to their very summit. The meadows are in the highest degree luxuriant, and the hills are covered with abundance of pasture for cattle, sheep, hogs, deer, and goats. The timber found on the land in their wild state is different, according to their quality (a circumstance which the intending settler should observe carefully): that on the best lands being walnut and chestnut; the next best, maple, beech, oak, and hickory; the third quality, pine, spruce, and hemlock (a kind of fir-tree); and the poorest lands are encumbered with shrubs, brambles, and bushes. When the lands are brought under cultivation, their produce, in Indian corn, wheat, buckwheat, potatoes, &c., equals that of any of the eastern sections of the Union; and the soil, especially in the hilly parts of the north, is well adapted for grazing. Mr. Flint mentions that produce

in this district may be stated at from twenty to twenty-five bushels of wheat, and from twenty-five to thirty bushels Indian corn. These, he adds, are raised under slovenly management, and without much labour. A farmer expressed his contentment with the crop under existing circumstances. "A dollar a bushel for wheat," he said, "made a fair price, where he has neither rent nor taxes to pay. His own farm paid about four or five dollars a year for the support of the state and county officers." The expense of taking cattle from these inland parts, where they are easily fed, to the market at Philadelphia (where they always command cash), is about 5s. 9d. a head. The great roads from Philadelphia and New York, to Pittsburg, on the Ohio, pass through part of the district. There is also a canal between Philadelphia and Pittsburg, which intersects the southern parts of it, and affords means for transporting the produce of the country to markets on both sides.

In a letter written by a Mr. Emerson, in Philadelphia, published in the *Morning Post* newspaper (Feb. 1841), which has been brought under our notice by a respectable authority, a peninsula, lying between the River Delaware and Chesapeake Bay, is represented as exceedingly favourable for the settlement of agriculturists. The lands are described as level and of good soil, but exhausted in some degree by incessant cropping without manure. In consequence of this deficiency, many of the farms are abandoned, or nearly so, and the emigrant who has a small capital is recommended "to purchase or lease one of these reduced farms, which, by applying to it some of the agricultural skill of Europe, will not fail to yield him a rich reward for his labours. How much better," continues the writer, "is such a place for the European emigrant, than going out into the wild woods, where the state of society is often extremely rude, the country undrained, and consequently more or less unhealthy; the roads almost impassable, and the difficulties attendant upon raising and getting crops to market, almost tenfold of what they are on the shores of our great bays. I have made long visits to new settlements, and therefore am prepared to speak of them from actual observation. Suppose the emigrant pays for wild land in Ohio, Illinois, or elsewhere, the customary price of one dollar twenty-five cents per acre, the expenses of clearing off the trees, or getting it into cultivation, will make it cost more than the cleared farms in Delaware, Maryland, and Virginia, with the addition of all the expenses required to bring them into a high state of productiveness. In the west, the settler may get 37½ cents per bushel for his wheat, and 12½ cents for his Indian corn. In the old settlements just named, he gets 1 dollar to 1 dollar 50 cents for his wheat, and from 50 to 75 cents per bushel for his Indian corn. In the new settlements, potatoes, oats, fruits, &c., are of no further profit than as they furnish supplies to the immediate family or farm stock. The same may be said of his poultry, pigs, &c. In conclusion, I can assert that, of the many good and industrious European farmers whom I have known to settle on the peninsula, every one has in a few years either become independent or acquired considerable property, although the means of several have at first been very limited." Whether these statements are to be fully depended on we are unable to say; but they may easily be verified by the emigrant making inquiries on the spot, before determining on a place of settlement. We recommend him, however, by all means, to see the land himself, before concluding a bargain: this caution cannot be too often repeated. It is not to be expected that every desirable object should be united on one property; but many inconveniences can be observed by a man's own eye, which no one will point out to him. It must in general be borne in mind, that the best carse lands, or the rich bottoms of valleys, are not the most healthy; and a situation near marshes, or pools of shallow water, is always to be avoided even in the healthiest districts.

Mr. Shirreff mentions, that in the neighbourhood of Philadelphia, land of fine quality and in high condition may be had at from 100 to 120 dollars per acre; uncleared land will of course be had for much less. Mr. Shirreff compares the country around Philadelphia to the finest parts of the south of England. Many of the fences consist of well-kept thorn hedges; and the crops were in general excellent, although the land was not highly cultivated. He says, "Men assisting at farm work in the neighbourhood of Philadelphia get from ten to twelve dollars, with maintenance, per month, and they are not easily obtained to attend regularly at work."

The Countries in the valley of the Mississippi.—The climate of this extensive region is not unsuited to European constitutions, though perhaps requiring greater caution on a first arrival than in the old states; because, being an inland country, the heat of summer and the cold of winter are not softened by those breezes from the ocean which moderate the temperature of islands and sea-coasts. In marshy situations, and close by the banks of rivers, especially if the woods in the neighbourhood have been left uncleared, agues and fevers are not uncommon during autumn; but these, with due caution, are seldom fatal, and are looked on by the inhabitants with little apprehension. None of the large towns have been set down in unhealthy situations; and the settlers, in selecting lands, can at present have their choice of fine upland grounds, which are not liable to any disease.

With this drawback, which it was necessary to state at the outset, the region we have now mentioned presents a scene of promise to the industrious settler which is hardly to be equalled. The greater part of the land is a fine black mould; in some parts, particularly the river sides, where the grass continues rank all the year, it is covered with heavy timber; in others, where burning of the dry grass in summer prevented the growth of trees, it lies in fine meadows, called here *prairies*: and in the hilly, or rather *knolly* districts (for the land is generally flat), there is a growth of shrubs and underwood. The soil of the last portion is lighter than the others, but still it is excellent, and in that fine climate produces every kind of crop abundantly. These situations, too, are often the healthiest, in a degree which compensates for their inferiority in point of richness to the carse and meadow lands: it is even said that they are the best lands for growing wheat. The natural productions of the country are in the principal matters the same as those of the other states—Indian corn, wheat, oats, barley, buckwheat, potatoes, sweet potatoes, and rye. Of these, oats, barley, and buckwheat, are, we believe, hardly natural to the climate, and do not thrive so well; but, to make amends, there are tobacco, cotton, hemp, the grape vine, the papaw tree, the tomato, and other productions, which are not cultivated in the north of America or in Britain. Wheat produces a good and sure crop of about 30 to 35 bushels of 60 lbs. per acre: it is not uncommon to have it weighing 66 lbs. Of this country Mr. Shirreff says—"All the rivers of magnitude in the valley of the Mississippi seem to have occupied, at a remote period higher elevations and wider channels, than they now do, called first and second banks; and the flat space on the margins of their present channels passes by the name of *bottom*, which generally consists of alluvial depositions, annually augmented by the overflowing of the waters at the melting of the snow." This valley, he says, was indescribably rich, the soil of considerable tenacity, and some Indian corn he estimated at twenty feet high. Mr. Shirreff, however, differs from Mr. Flint in his opinion of the prairie grounds, he con

sidering them as by no means so fitted for cultivation as the same kind of land in Illinois. Most travellers agree in describing the countries of the Mississippi as peculiarly suited for agricultural pursuits.

Mr. Flint mentions, as a proof of what can be done in this country by industry, that he met a settler who had that year raised nine hundred bushels Indian corn and wheat, by his own individual exertions. Mr. Flint had previously heard of a negro, settled on the prairies near Vincennes, who had the same year raised one thousand bushels. The soil is well adapted for growing the European vegetables; as a proof of which, we find it mentioned that cabbages grow to the size of 13 and 17½ feet in circumference: those of nine feet round in the head are common. Parsnips, carrots, and beets, are remarkable for their size and flavour; peas excellent, and very prolific; onions are raised with no other trouble than sowing the seed, and keeping the ground clear of weeds. The following extract from the memorandum of a naturalist in that country, will give an idea of the periods of the seasons:—April 1st, Peach-trees in blossom. 2d, Asparagus in blossom. 3d, Peas, beans, and onions, planted. 10th, Spring had completely opened, and the prairies were green. 18th, Lilac and strawberries in bloom. 27th, Lettuce and radishes fit for use. 30th, Roses and honeysuckles in full bloom. It is mentioned, also, that turnips, sown on the 10th September, will grow to a very large size before winter. Besides its capability for rearing grain, &c., it is one of the best cattle-feeding countries in the world. "A farmer," it is said, "calls himself poor with a hundred head of horned cattle around him." Hogs, from the abundance of all kinds of vegetables, are reared and fattened in great numbers; and the demand at New Orleans affords a ready market for all. Nothing is more common than for an Illinois farmer to go among his stock, shoot down and dress a fine "beef" (as they call the ox), whenever fresh meat is wanted. This is often divided out among the neighbours, who in turn kill and share likewise. It is common at "camp meetings" (*teat preachings*) to kill a "beef" and three or four hogs, for the subsistence of friends from a distance. A three-year-old heifer is fed to about 423 lbs. (whole carcass), and sells for 5½ dollars, or 24s. 6d. By the 1st of June or middle of May, the young cattle on the prairies are fit for the market. Common cows, if suffered to lose their milk in August, become fit for table use by October. Every farmer, besides his own land, has the range of the meadows around him, both for his cattle, hogs, turkeys, and poultry, so that they are reared in immense numbers, and at small expense. They are purchased readily, both, as mentioned formerly, for the New Orleans market, and by drovers, who take them to the east coast, Philadelphia, &c. This district affords, indeed, the chief supply of live-stock for the Union. Altogether, the fertility of the country, and the abundance of its natural productions, are such, that the inhabitants are afraid of not being believed in mentioning them to the other Americans. These statements may appear somewhat overdrawn, but all the favourable impressions which had been made concerning this country, by the reports of former visiters, have been confirmed, in the most satisfactory manner, by Mr. Stuart of Dunearn, who passed through the whole territory in 1832, and conversed with the most intelligent of its inhabitants and public men. His account agrees in every thing with what we had previously heard of the great fertility and growing importance of the country.

The influx of emigrants into Ohio and the neighbouring states, has continued for these twenty years in multitudes, and without intermission. They can now travel by canal and by railroad; but in the absence of these, the poorest emigrants still urge forward, over every difficulty, to the western land of promise. "It is truly interesting," says Mr. Flint, "to see people of different countries, and of different dresses, coming forward in the mail-coach, on horseback, and on foot. At first view, this great migration leads to the conclusion, that oppression, and the fear of want, are in extensive operation somewhere to the eastward." "On Sidelong Hill," he says in another place, "we came up with a singular party of emigrants—a man, with his wife and ten children. They were removing from New Jersey to Pittsburgh, a land journey of 340 miles. The eldest of the progeny had the youngest tied on his back, and the father pushed before him a wheelbarrow, containing the movables of the family. Abrupt edges of rocks, higher than the wheel, occasionally interrupt the passage: their humble carriage must be lifted over these. A little farther onward, we passed a young woman carrying a sucking child in her arms, and leading a very little one by the hand. We could scarcely look before or behind without seeing some emigrants travelling. No pilgrims were ever so diversified or interesting as these."

Mr. Flint seems to have been surprised at the numbers whom he saw on the roads, all moving in one direction. His description reminds one of the multitudes seen streaming on in pilgrimage towards the Indian temple of Juggernaut; but the pilgrims of the Old World are generally going to seek a relief from their misery in superstitions or death; here they appear to have been led on by much more comfortable anticipations, at least if the next extract may be trusted.

"We arrived at a tavern. The bread was not prepared; but the people were obliging, and made it ready for us in a short time. The landlord was a farmer. He told us that Indian corn sells here at 13½d. per bushel, and that he could procure 20,000 bushels of it within three miles of his own house. Wheat sells at 3s. 4½d. per bushel."

The principal districts in the western country are Ohio, Indiana, and Illinois. There are considerable towns settled in each of these, the most advantageous situations those likely to become important in the commerce of the country, having been immediately pitched upon for the purpose. Some of these have hardly been longer in existence than fifteen years; few of them, except those on the river Ohio, longer than thirty; yet, from the influx of new settlers, and the facility these find in maintaining themselves and their families, such places are already populous and thriving. The country is generally flat, so that the towns do not, as in some of the western states, owe their origin to favourable situations for water-power. Manufactures, grist-mills, &c., if ever established here, must derive their power from steam; for which, indeed, the abundance of coal offers great facilities, while the smooth course of the numerous rivers makes the means available over the whole district.

Cincinnati, a town situated on the Ohio, on the confines of the two states, Indiana and Ohio, is a place of great trade. In 1800, it contained only 750 people, in 1805, only 960; it was then surrounded by a wild country, occupied by the Indians. The country around is now cultivated, and the number of inhabitants in the town is about 35,000, composed of people from all parts of Europe and the United States, who have been attracted by the advantages of the place. On the opposite side of the Ohio, in the state of Kentucky, there is another town, which is divided into two by the river Licking; these two parts are laid out on the same regular plan as Cincinnati, so that the whole appears one city. There are many great manufactoring works here—steam-mills, glass and iron-works, &c., and the bustle of the place gives the farmers an excellent market for their produce. This advantage is further increased by the trade of the numerous large steam-boats which here take in cargoes of beef, pork, flour, &c., for their voyage down the Ohio and Mississippi to New Orleans. Formerly, they were

not easily ascend the river, on account of rapids which occur farther down at Louisville; but these have been now overcome by a canal two miles in length, cut through the rock at that place. Louisville itself is situated in Kentucky, and is a place of considerable trade.

Other large towns in this tract of country are Pittsburg, Wheeling, Steubenville, Marietta, and Chilicothe. They afford a considerable market for agricultural produce; and the free navigation to New Orleans, as well as the facilities now afforded by a canal cut to intersect the country from the Ohio, at Portsmouth to Cleveland, on Lake Erie, secure a constant and steady demand for grain, salted beef, pork at the mall, &c. The Americans look forward to this district, and the vast countries surround. , as the future pivot of their national grandeur.

The countries in the valley of the Mississippi include Illinois, Indiana, and Missouri, to which we shall now advert.

Illinois and Indiana.—The tide of emigration has for some time back been setting towards the west countries, and among these Illinois is conspicuous for its great extent, and the general fertility of its soil. This state is 382 miles long and 154 broad, with an area of 58,900 square miles. It is bounded on the north by the Wisconsin or north-west territory, on the east by Lake Michigan and Indiana, on the south by the Ohio, and on the west by the Mississippi. The whole country is described as a very gently inclined plain, very level—no height reaching above 600 feet. It is nearly all prairie, with a few groves of timber widely separated from each other, and deeply indented with ravines whose sides slope into low round hills. Illinois is favourably situated with regard to water communication. On one side it has the Mississippi as its boundary, on another side the Ohio and Wabash; to the north it is washed by Lake Michigan. The Illinois, from which the state receives its name, connects Lake Michigan with the Mississippi; Rock and Kaskaskia are also navigable rivers; and besides these there are numerous boatable streams.

The soil of this state resembles that of Ohio, but with less irreclaimable land. On this subject Mr. Shirreff says—"The soil of Illinois is variable, and the different habitations of the varieties of the sunflower, and other tall-growing plants, often distinctly marked changes of soil on the prairie. The prevailing soil between Chicago and Springfield was black sandy loam, and occasionally considerable tracts of clay or heavy loam intervened. In this distance of nearly 200 miles, I did not pass over in all ten miles of bad soil, which was light-coloured sand. The surface, which is forest, oak openings, or prairie, has no relation to quality of soil, all of which abound with soils of every description." These prairies are covered with grass three or four feet high, which is burned annually, either being set on fire wilfully or igniting from natural causes. No danger is apprehended from this burning, the ploughing of the ground around a dwelling being sufficient to prevent the fire from spreading so far, and the grass, being perennial, comes up again in the spring.

The productions of Illinois are Indian corn, wheat, potatoes, cotton, hemp, flax, &c. Fruits, such as the grape, apples, peaches, gooseberries, &c., arrive at great perfection, and the silk-worm has been found to succeed well. In the wooded parts, the trees exhibit a luxuriant growth, and are often seen of an enormous size. The mineral productions are of great value, consisting of lead, coal, copper, and lime, and good building stone. The lead-mines, which were opened in 1821, are situated in the north-west corner of the state, at a place called Galena, on the Fever River. Salt is also manufactured extensively at Shawnectown in Gallatin county; and other salt springs have been discovered in different parts of the country. The climate of Illinois does not differ very materially from that of the other states in the same latitude; from its lower situation it is perhaps generally milder. In the southern parts the winter is said seldom to exceed six weeks; in the northern parts, again, it is sometimes very severe, but not of long duration. Settlers on their first arrival are apt to be attacked by bilious fever, but with proper care as to clothing and diet this may be avoided. A disease called the *milk sickness* frequently attacks the cows in this country, and has even proved fatal to man, from drinking the milk of the diseased animals. It is supposed to be caused by the cows eating the leaves of a poisonous grape, which might be easily prevented by rooting out the plant from around a farm.

Mr. Shirreff speaks very highly of this country as a field for emigration; being of opinion that there is no country in the world where a farmer can commence operations with so small an outlay of money, and so soon obtain a return. This arises from the cheapness of land, and the facility with which it may be cultivated, there being little or no forest land to clear. Mr. Shirreff makes a statement of the expense of purchasing 200 acres of land, fencing forty acres, ploughing and sowing eighty, harvesting, building houses, and maintaining family, which he estimates at 1604 dollars, equal to £340, 17s. With this expenditure is obtained the dairy produce of four cows, the improvement of eight cattle grazing on the prairie, and 3200 bushels of Indian corn, besides vegetables, and the improvement of pigs and poultry. Next year, the settler might plough eighty acres more; and in eighteen months after settling, would have expended £484, 4s., and reaped 6400 bushels of Indian corn, and 1600 bushels of wheat, besides abundance of vegetables, dairy produce, beef, pork and poultry. In this statement, Mr. Shirreff has stated the produce at 22½ bushels per acre, which is lower than what he was told land in Illinois generally yields. He supposes, also, that the farmer and family only attend to the cattle; the ploughing, &c., being performed by contract. In the case where the farmer himself works, he estimates the purchasing, fencing, ploughing, sowing, &c., of eighty acres at 609 dollars, or £130 sterling; and for this the farmer reaps 2400 bushels of Indian corn, 675 bushels of wheat, and receives the dairy produce of one cow, pigs, and poultry, besides abundance of vegetables.

Grazing is extensively carried on in the prairies of Illinois, the cattle being sent to New Orleans in great numbers. "With an unlimited range of pasturage for the rearing of cattle," says Mr. Shirreff, "and Indian corn at 15 cents, or 7½d. per bushel, the farmer might comfortably live by stock, without cultivating any portion of land."

The capital of Illinois is Vandalia, which is situated on a high bank of the river Kaskaskia, in the midst of a rich and thriving country. There are also several other towns rapidly rising into importance, such as Edwardsville, Carlisle, Kaskaskia, &c. The state of Indiana resembles Illinois, but contains a greater portion of waste land. The land is mostly all prairie, and the country is well watered by numerous rivers.

Missouri.—The state of Missouri is separated from Illinois by the river Mississippi, which flows along its east and north-east sides. It contains considerable diversity of soil, being in one part hilly, and in others marshy; but for the most part it is good prairie land. Its means of internal commerce are great, from the Missouri and other rivers flowing through it. Mr. Flint says of its soil—"This state possesses lands already fit for the plough, sufficient to produce wheat enough for the whole of the United States. Prairies of hundreds of thousands of acres of first-rate wheat lands—covered with grass, and perfectly free from shrubs and bushes—invite the plough; and if the country were cultivated to a proper extent, it might become the granary of the world." The climate

of this state is changeable; the winters are sometimes very severe, and the summers extremely warm. In several parts of this state the climate is unhealthy, owing to swamps and lakes; but in the mountainous tracts the inhabitants enjoy good health. The staple agricultural productions are wheat and Indian corn, with the usual fruits of warm countries. Cotton is cultivated in the south-east section, along with tobacco; and hemp and flax are becoming important articles of produce. This state has been long celebrated for the immense deposits of lead ore found among the hills. There is one district, extending over nearly one hundred miles, which is particularly distinguished for its lead mines. The ore is found imbedded in masses, and appears evidently to be a deposit. Coal is also found in several parts of Missouri, as also iron ore, manganese, zinc, &c. The chief town in Missouri is St. Louis, pleasantly situated on an elevation close to the Mississippi. It is a thriving place, rapidly rising to importance, being the port at which all vessels arrive from New Orleans, &c.

The Count Marbois thus speaks of the states in the valley of the Mississippi:—"At the junction of the Mississippi and Missouri, the lands lying towards the north-west are of admirable fertility; and these districts, though remote from the sea, will one day be as densely populated as any portion of the world. The Mississippi, the Missouri, the Arkansas, the Red River, and their tributaries, water 200,000 square leagues within the space of country called the valley of the Mississippi. This internal navigation, prepared by nature, has already been greatly extended and improved by canals, and steam-boats ascend and descend against wind and tide with great speed. Wood and coal, indispensable agents in this navigation, abound on the shores of the rivers, supplying steam-ships with the means of traversing this magnificent stream."

These states, from the facility of communication, may be reached from any of the great ports of the Union. The route by New Orleans is recommended as the cheapest, from the number of steam-ships which are constantly plying between that port and St. Louis on the Missouri. The cabin passage from Liverpool to New Orleans is £35, and the passage from New Orleans to St. Louis £5, 6s., including provisions; the steerage passage is from £4 to £5 to New Orleans, and £1, 14s. to St. Louis, exclusive of provisions.

Michigan.—The reader will observe on the map a tongue of land, situated between the two lakes, Huron and Michigan; this tract, with another which lies on the west, between Lake Michigan and the Mississippi, has been lately begun to be settled by emigrants from the old states of America. The two together possess great recommendations to agricultural emigrants. The capital is Detroit, a town situated on the river which connects Lake Huron with Lake Erie, and containing 2500 inhabitants. Those lakes, with their rivers and canals, give the district access to the markets of New York, New Orleans, and Montreal.

The climate is temperate and healthy: winter sets in generally about the middle of November, and continues till about the middle of March. At Detroit, in 1818, the mean heat of January was 24°; and in 1820, the mean heat of July was 69°, of December, 27°. The country is situated upon limestone rock, rather hilly, and possesses what the Americans call good water privileges—that is, numerous falls of water for mills, &c. It is better watered than any other in the United States, being finely diversified with lakes and brooks, rising in most parts from copious springs.

The soil is in general a good fertile loam, upon limestone: in some places a calcareous earth is turned up, mixed with the common soil; in others, the loam is mixed with a little sand; both are extremely productive. The country is, in some districts, under heavy timber, and in others an open prairie, where the settler has nothing to do but start his plough. Horses here cost from £18 to £22, 10s.; oxen from £15 to £18 a pair. The produce of the land runs from 25 to 50 bushels of wheat, after one bushel of seed. The cotton plant, the grape vine, the sweet potato of Carolina, the tomato and egg plant, have all been successfully cultivated. Rye, barley, oats, peas, beans, and potatoes, as well as all kinds of vegetables usually cultivated in the same latitude, produce here in great abundance. Peaches and pears have been tried, and both produce delicious fruit: near towns, pears sell at from 2s. to 4s. per bushel; apples vary from 6d. to 2s. per bushel; currants, blackberries, raspberries, and strawberries, thrive exceedingly. Indian corn is less luxuriant than in the valley of the Ohio, the climate being somewhat colder. This country, on the whole, seems more congenial to European constitutions and habits than the other western settlements.

The richest and perhaps most beautiful part of the territory, is generally thought to be that adjacent to the St. Joseph's River, on which twelve new counties are formed. The soil is excellent, and there are numerous falls of water, for mills, &c.

At any of the government land-offices (which are established, wherever there is land to sell, in all the states), a settler may provide himself with a farm, at the usual rate of 5s. 7½d. per acre. No quantity smaller than 80 acres is sold by government. Should he chance to fancy one in some favoured spot (most of which are already secured along the great public road for 300 miles through the country), he will have little difficulty in procuring it for 12s. or 15s. an acre. An extensive tract of country upon the river and bay of Saginaw (on the west side of Lake Huron) is spoken of in terms of high admiration for the richness of the soil and beauty of the natural scenery, and also as presenting uncommon inducements to enterprising and industrious farmers and mechanics, from its central and advantageous position for business. The river Saginaw is navigable for boats, twenty miles from the head of the bay, and a road is made to Detroit. Fox River, on the west side of Lake Michigan, is also specially noticed as highly desirable for settlers, in regard to quality of soil, beauty, and local advantages; a canal is projected to connect this river and the lake with the Mississippi.

Mr. Fergusson, to whom we are indebted for the above particulars, gives an estimate, from the experience of persons acquainted with the district, of a purchase in Michigan, and of its returns:—

Price of 160 acres, at 1¼ dollars per acre,	£45	0	0
Seed, labour, and rail-fence, at 6 dollars, for, say, 150 acres, - - - - -	202	10	0
Harvesting, at 2 dollars, - - - -	67	10	0
Dwelling-house, stables, &c., - - - -	180	0	0
Returns.	£495	0	0
Produce of 150 acres, at 20 bushels per acre, at 1 dollar per bushel, - -	675	0	0
Profit,	£180	0	0

No allowance is here made for maintenance; but it is to be recollected, that the wheat crop may be repeated for three or four years without manure, and in the succeeding years the charge for purchase disappears, so that the advantages of the latter are obvious. These are properly appreciated by the Americans, the number of emigrants flocking to Michigan being immense. Its population in 1831 was estimated at 32,000.

Detroit, the capital of Michigan, is the embryo Constantinople of the inland seas of North America. It is situated in a narrow channel, which connects the two lower lakes, Ontario and Erie, with the three upper, Huron, Michigan, and Superior. Having access in every

direction to countries of more fertile soil than those of Greece or Asia, and possessed of an equally favourable climate, it begins its career with political institutions far more propitious to human welfare than were possessed by the celebrated city we have mentioned; and it promises one day to be the abode of a more numerous as well as happier population.

Other Districts.—The three districts we have mentioned are those in which the greatest quantities of land are yet unoccupied, and where it is to be had cheapest; but there are others in which settlers may locate themselves with advantage. Among these is the district of Genessee, in New York state; and, indeed, the whole valley of the River Hudson presents at intervals spots on which good land may be purchased, especially by those who would rather sit down in a place partly cultivated, and near markets, than in the heart of the forest.

DIFFERENT CLASSES OF EMIGRANTS.

Men with Capital.—There are three different classes of emigrants, each of whom will be guided by different motives in their choice of a situation. The first is composed of persons who are possessed of capital to some amount, and who have been accustomed to move among the wealthier classes of society in this country. If these individuals intend to devote themselves to agriculture in the country to which they are bound, every circumstance leads us to believe, that unless they are prepared to submit to very great sacrifices of personal comfort, and that for no inconsiderable time, they ought to purchase land partly improved, and as near some of the towns as they can find it. The hardships of a new settlement to persons who have not been accustomed to labour, are hardly such as can be anticipated by description; while the total change of habits—labouring in the woods, living in log-huts, and the want of regular food—often induces disease, of which such persons may feel the effects during the whole of their after lives. Abundance of half-improved properties may be found (as we have mentioned under the title Purchasing of Land), upon which moderate labour, and the exertion of some skill and attention, will secure excellent returns. These may be heard of at any of the large towns, but chiefly at New York, or at Albany, Genessee, Rochester, Geneva, &c., in that state. In Philadelphia, also, in the state of Pennsylvania, most eligible purchases of this kind may be made; and at Pittsburg, a very busy manufacturing town in the same state, on the river Ohio, there are many properties on sale which must rise in value every day with the increasing commercial importance of the place. There are immense beds of coal, iron ore, and limestone, in the vicinity of the town, and the navigation of the Ohio is uninterrupted (though there are some inconsiderable rapids) the whole way to its junction with the Mississippi. Communications by canal and railroad are also now completed, to connect the Ohio at this place with Baltimore and Philadelphia, so that the town of Pittsburg is already of great wealth, and promises rapidly to increase. The land in the neighbourhood is of uncommon fertility, and may be obtained now at prices lower than can be expected in a few years, when a greater number of settlers shall have arrived to occupy it. Properties within twenty miles of the town already sell very high—say fifty dollars or more. Almost the same observations may be made with regard to Louisville, Cincinnati, and Jeffersonville, which are situated in the states of Ohio, Kentucky, and Indiana; these places already possess great trade, and from the abundance of minerals, coal, lime, iron, salt, and lead, which are found in the neighbourhood, they must continue to increase. Farms, therefore, purchased in their vicinity, are certain to rise in value, and, with attentive cultivation, will, in the mean time, pay the cultivator abundantly for his labour and capital. Cincinnati particularly is a place of great activity and persons who settle in its neighbourhood will easily find society to their liking; it presents, indeed, though so remote from European cities, no difference nor any inferiority in this respect. It is right to mention, however, that the whole of the western country, and, indeed, of all the countries which are in progress of settlement, are overrun with a swarm of speculators in land, and in projected establishments, new cities, manufactories, &c., of all which the moneyed emigrant ought to avoid as a set of locusts. Americans may deal in those matters, and may, perhaps, profit by them; but emigrants never can do any thing but involve themselves in difficulties by such schemes. Let them look to *certainties exclusively*: the quality of the land, the healthiness of the site, the neighbourhood of a market already established—these are the only considerations that should weigh with them, and no other. In short, to those who have capital, we would say, without hesitation, choose your abode near some of the principal towns; it is almost indifferent which. The soil of the western countries on the Ohio is the richer, and its produce more varied and luxuriant, but the prices of agricultural produce are lower than in the old states, and labour dearer. This is the sole and essential difference, except, indeed, to those who wish to speculate in buying land, by adding to its improvements, and then selling it at a higher rate, when their own labour, and the increasing density of the busy population around them, shall have added to its value. To persons who wish to make money in this way, the vicinity of the rising towns in the western states is certainly a field of high promise, and many have already realized large sums there by proper management in that manner.

Mechanics, Farm-Servants, and Labourers.—Mechanics and labourers, in looking for a situation where they may settle, will be guided by very different views from those of persons possessed of capital. The latter, if they wish to buy land, will prefer to have it in a place where labour is cheap, and farm produce sells dear. The man who lives by his wages, on the other hand, would have labour high, and all manner of provisions cheap. We have advised those possessed of capital to look for settlements as near the large towns as possible, where markets and labour are most easily procured. In regard to the places to be chosen for settling by mechanics, farm labourers, and others who look for work, we believe, that to those who possess funds sufficient to carry them forward to the western or inland states, there can be no doubt but these afford the preferable field for them, both in respect to wages, and cheapness of living. The towns on the Ohio are all gaining rapidly in population and importance, from the richness of the country with which they are surrounded; and many considerations make it probable that if manufactures be ever largely established anywhere in America, it will be here. The carriage of foreign manufactured goods is very expensive to a country so remotely inland, and to which they have to be carried through so many canals, rivers, or railroads; and the district itself produces cotton, silk (if cultivated), iron, lead, coals, &c.; so that there is here a *bonus* for manufacturing on the spot which hardly any other country possesses. The consequence begins to be already felt: manufacturing establishments are begun, wages are high, and the price of living is withal exceeding low. To mechanics and labourers, therefore, who have money to defray the expenses of the journey, we cannot but say that the western states present by far the most favourable opportunities. The following extract of a letter is from Cincinnati, on the Ohio:—

"The improvements in Cincinnati are rapidly increasing: the communications opened by means of the canal and the new roads give an impetus to trade. Whatever number of artisans, mechanics, and labourers come out,

they will find abundant occupation. The soil is excellent. Engineers are in great demand. Engravers, particularly those who will work in general work, as maps, names, &c.; card-manufacturers; tinmen and braziers; bell-hangers, with a knowledge of casting or directing in that department; baking, brewing, and malting; are good trades. Glovers, stocking-weavers, first-rate planemakers, turners in steel, iron, brass, and wood, are much wanted. Carpenters, joiners, builders, plasterers, bricklayers, stone-masons, plumbers, all who are good at their business, and labourers, can get plenty of work at 3s. or 4s. per day. Gardeners and mechanics average 4s. 6d. to 9s. per day, curriers, 9s per day, journeymen's wages. Tailors get 20s. for making a coat. Hatters do well."

On the subject of wages, Mr. Shirreff says—"An industrious and sober man must rapidly accumulate wealth by working for hire, and many perhaps err by purchasing land instead of continuing to work under the direction of others. On leaving New York, a gardener, who was working at Haddington when I left Scotland, gave me ten pounds sterling, which he had saved since his arrival in America, to enable his wife and family to reach him. A young man whom I had often employed at spade work at 1s. 6d. a day, was earning by sawing stones at Cincinnati 4s. 3d. a day, with board."

Let it be recollected, that, with these wages, flour is at 9s. per 112 lbs.; mutton at 2d. per lb.; sugar 4d. to 5d. per lb.; coals 5d. per bushel.

It may now be asked, what additional expense will be required to take a mechanic to Cincinnati, after he has reached New York or Philadelphia? To this we find it answered, that the journey from New York to Wheeling (a town on the Ohio) costs 25 dollars, or £5, 12s. 6d.; and from Wheeling to Cincinnati, by steamboat on the Ohio, the fare is 10 dollars, or £2, 5s. The whole expenses, therefore, from New York to Cincinnati, are £7, 17s. 6d. The journey may now be made, by the canals and steamboats, to Buffalo, on Lake Erie; thence to Cleveland; and from that place, by the canal, to Cincinnati. This will reduce the expense somewhat. The same letter from which we have quoted above, mentions, that a family of respectable persons had arrived at Cincinnati from England, and that the whole expense of their journey (with 2500 lbs. luggage) was £75. But there is no occasion for going even so far as Cincinnati—Wheeling itself, or Pittsburg, which, though still on the Ohio, is much nearer New York, present quite the same inducements to mechanics of all descriptions.

Labour is in the greatest demand everywhere. The people are not able to avail themselves of the riches of the country which they inhabit without assistance. Mr. Flint, who travelled on foot, was stopped by the farmers asking him anxiously if he "*knew of any traveller who would rest himself, and thrash for a few days;*" and Mr. Stuart of Dunearn, after telling one of the Ohio settlers the work usually done by farm-servants in Scotland, was charged, on departing, not to neglect sending some of them to America, if possible.

It is not in one or two districts of the Union that this demand for work-people exists, but everywhere. The towns immediately on the coast are generally better supplied with tradesmen, labourers, &c., than those inland, because emigrants first land there, and often apply for employment as soon as they go on shore; but in all that we have heard on the subject, we find no instance of a person who was willing to work, and who did not find employment.

Persons who wish to buy small lots of land.—Besides emigrants possessed of good capitals, there are often men who are acquainted with farming business, and with that only, but who have not money to buy improved land, and who wish, therefore, to depend on their own industry for clearing ground for themselves. Many such men, after persevering for years, with their families, in unrequited labour in this country, have gone to America, and become proprietors of well-improved and rich farms. We could quote numerous examples of this kind; the following is from Mr. Flint's interesting publications:—"J. M., a man from the county of Edinburgh, arrived here (near Pittsburg), and had settled with his family, seven sons, two daughters, and a son-in-law, about ten months before I met him. He has purchased 480 acres of land; built two log-houses and a small stable; cleared and enclosed about twenty-two acres, which are nearly all under crop; deadened the timber of about eighty acres more; and planted an orchard. In addition to these improvements, his sons have wrought for a neighbour to the amount of a hundred days' work. He has a horse, a cow, a few hogs, and some poultry. I inquired if he felt himself happy in a strange land. He replied, that he would not return to Scotland, though the property of which he formerly rented a part were given him for nothing."

This instance—and hundreds of others might be quoted—will show that people from this country, with a stock of from £50 to £100, may establish themselves well in America. Smaller sums than these will hardly suffice to land with, if the settler intends to buy land immediately; because eighty acres of land (which is the least quantity sold by government) costs £22, 10s.; and though something were done to raise a crop the first season, the other expenses of a log-house, &c., would absorb every thing. The price of government land is required to be paid immediately.

The following quotation affords a graphic description of the situation and life of cultivators in the woods:—"The settlers in the woods appear to be the most contented and independent people, in their way, I ever met with: perhaps with only a log-house, unplastered, containing two rooms, one above and one below, sometimes only one below, with a large open fire-place, and a log-fire. The chimney back and hearth built of stone, picked up about the farm; a boarded floor unplaned, perhaps hewed only, if too far from a saw-mill; one or two small glass sash windows, and sometimes at first none; doors and gates with wooden hooks and hinges. A few articles of common household use; two spinning-wheels, one for flax and one for wool, with reaves of spun-yarn hung round the inside of the house on wooden pegs, driven into the logs; an upright churn; a rifle-gun; a dog or two; an oven out of doors, at a little distance from the house, built sometimes of clay, sometimes of brick or stones, often placed on the stump of a tree near the house, and with a shed covered with tree bark to keep it dry; a yoke of oxen, some young steers, two or three cows, eight or ten sheep; perhaps a horse, or a span (yoke); a sleigh wagon, a plough and harrow, the last perhaps with wooden teeth; these form all their riches except their land, and on this they often raise one hundred or two hundred bushels of wheat, eighty or one hundred of Indian corn, some oats, peas, and perhaps buckwheat and a patch of flax: and fatten three or four hogs and a cow, or a yoke of oxen in a season, besides seven or eight more store pigs, and a sow or two. Those who brought a little money with them, or were fortunate in having a family of industrious sons, get perhaps a good frame house, or, at all events, a good frame barn, eighty or one hundred acres of land cleared; grow four hundred or six hundred bushels of wheat; other things in proportion; with two or three yoke of oxen, twelve to thirty fat hogs, two to five horses, &c., half of them or more brood mares."

The following is a ruder picture of industry:—"In Maquapin county (Illinois) one of our frontier men settled himself on government land three or four years since, with four or five sows for breeders, worth as mu-

dollars. In 1829, he drove forty-two fat hogs to market, which he sold for 135 dollars (£30, 7s. 6d.) The amount of corn given to the whole before he drove them, did not exceed one bushel. They lived on the *range*, and grew fat on *mast*, that is, beech-nuts, walnuts, acorns, &c.; had they been fed on corn they would have sold higher. Of the proceeds, 100 dollars (£22, 10s.) were applied to pay for eighty acres of land on which he had settled; the remainder served to pay some small debts, and to purchase his salt, iron, and groceries for the year. This is not an extraordinary occurrence, but one common in that country."

PURCHASING LANDS.

It was, until recently, the practice of the American government to sell the public lands on credit, receiving payment by instalments; but this plan was found so mischievous that it has been abandoned, and the public lands are now sold for cash only. While the credit system was in operation, many people were induced to become proprietors of large tracts of land which they had not the means of cultivating, and in the course of a few years the land again fell into the hands of government. The farmer was thus left in a worse state than when he first settled in the country; his capital was expended without having yielded him any suitable return. Most travellers concur in representing the cash system as much superior to the former practice of giving credit, for by it, although any person should be foolish enough to purchase land without having the means of cultivating it, his capital is not lost, as he may always get the price he paid for it again. In the United States there are public land-offices in the chief towns, at which maps of the sold and unsold lands are kept for inspection. Lands are first offered for sale by public auction, and are put up at from a dollar and a quarter to two dollars per acre. If no one offers these prices, they are exhibited on the land-office map, and may be obtained at any subsequent period. On the maps, sections of a square mile, and quarter sections of 160 acres, are laid down; six miles square constitute a township. The fifteenth section of each township is reserved for the support of a school. The deed which confers the right of property in the States is very simple. It is printed on a piece of parchment of the quarto size; the date, the locality of the purchase, and the purchaser's name, being inserted in writing, and the instrument subscribed by the President of the United States, and the agent of the general land-office. It is delivered to the buyer free of all expense, and may be transferred by him to another person without the intervention of stamped paper, law practitioners, or those absurd feudal usages which continue to disgrace the transfer of landed property in Great Britain. Emigrants in going into the woods to make a selection of lands, will do well to take with them an extract from the land-office map applying to the part of the country they intend to visit, and by this they will discover entered from unentered lands.

The public land is, of course, totally uncleared, and untouched by the plough; some of it is more heavily timbered than other portions, and it is of very various quality, that on the banks of rivers and alluvial grounds being exceedingly fertile, and other parts being either rocky or marshy, so as to be either too unhealthy or too unprofitable to be cultivated. The settler, however, has his choice, and, by going out into the woods, he may fix upon a lot to his own mind. An enterprising cultivator, particularly if he be a stout man, with a family of sons, may do very well upon such lands, because the original price is small; and after clearing them to some extent, and erecting one or two log-houses and barns, he can either extend his cultivation (which is easy after crops are got for the first three seasons), or he may sell at a considerable advance as population begins to increase around him, and as settlers arri who are not inclined to make first beginnings in th woods for themselves.

When lots are advertised for sale, there are persons who make it their business to go out to survey the whole tract before any one else has examined it; and by remaining in the woods for months, sleeping often in the open fields, and undergoing great hardships, they get acquainted with all the natural advantages of the land, the spots where there are water-power, minerals (such as salt springs, &c.), healthy, open, or fertile grounds, and select such of these as they choose, in order to sell them again at a profit. This practice raises the price of the best lands, and it is one which can only be followed by natives well acquainted with the face of the country; but it cannot be said to have much effect in retarding settlements, as the persons who follow it seldom have very large capitals, and are soon willing to dispose of their purchase at a reasonable advance to those who intend really to avail themselves of the natural advantages which the former have been at the trouble to search out.

In 1838, 12,251,966 acres of land were offered for sale, of which quantity 1,388,733 acres were sold; the price paid being 1,749,401 dollars, or about 1¼ dollar, (5s. 7½d.) per acre. At the commencement of 1832, the quantity of land unsold, and to which the Indian title had been extinguished, in the states of Ohio, Indiana, Illinois, Missouri, Mississippi, Alabama, Louisiana, and Michigan, and in the territories of Arkansas and Florida, was estimated at 227,293,884 acres. The quantity in the same states and territories held at that period by the Indians was estimated at 113,577,869 acres. The quantity beyond these states and territories was estimated at 750,000,000 acres; making the whole of the public lands at the commencement of 1832, 1,090,871,750 acres.

These are the public lands, but there are vast quantities of ground in the hands of individuals which have not yet been cleared, or only partially so; and the prices at which this is to be had vary according to the quality of the land, its situation with regard to roads and markets, or the work which has been already done upon it. Large quantities of this description of lands are to be had in the north-western districts of Pennsylvania, at from two to four dollars per acre; many portions of it are fertile, situated on healthy mountain sides, and in a climate more nearly resembling that of Britain than is to be expected in the low though rich valleys of the western states, where the public lands are chiefly situated. In the other old-settled states there is not so much of this kind of unoccupied land; though, certainly, when it comes to be in America as it is here, where every inch of ground is wanted for raising food, an immense quantity of what is now despised, will, by the operations of draining, trenching, and reclaiming, be brought into productive cultivation. In these states, particularly New York, there is, however, always abundance of properties in the market, parts of which have been long farmed, and which have houses and offices erected on them, for extending the cultivation of their remaining acres. These are offered at various prices, according to their advantages: and to gentlemen who have skill and enterprise to introduce better and more careful modes of farming, they offer admirable capabilities. The profit which has been hitherto realized in America, has been by merely breaking up the woods and prairies into corn land in the roughest and most unskilful manner; but a new field of enterprise and wealth remains to those who shall introduce in the settled states better breeds of cattle and more scientific modes of agriculture. In general, the American farmers entirely neglect the use of manures; they very often shovel the refuse of their stable-yard into the nearest

river; and one farmer is mentioned, who, rather than remove a dunghill which had gathered in his court, choose to build a new set of barns.* The national habits lead them continually to think of breaking up new land, and they always choose to do this rather than manure the old. They prefer, in short, taking their crop off a large field carelessly and unexpensively cultivated, to getting the same returns from a smaller piece of ground skilfully prepared. This is obviously a want of thrift as well as of science, and it is for this reason that we say that good farmers, with some capital, might take advantage of the half-improved lands which are on sale in the settled states,† and by buying them at the very moderate prices at which they are offered, enrich both themselves and the country, by the introduction of more business-like modes of farming. An attention to dairy produce, an improvement of the breeds of cattle, and the introduction of kinds which would produce fat of better quality, and with less expense or trouble than the kinds now known, would be of essential benefit.

The prices at which cultivated and half-reclaimed lands are offered in the district of Genessee (a very fertile one), are from twenty to forty dollars per acre. Mr. Fergusson mentions several farms which he saw on sale: one near Geneva was of 250 acres, "consisting of good loam, and some indifferent clay, well watered, but without any mill power. The wheat and Indian corn were excellent; the hedges thriving and in good order, with a double rail fence; the mansion-house and offices were very respectable. The price asked was 25 dollars per acre, or £1406, 5s. for the whole farm."

Mr. Fergusson mentions the prices at which some other farms were offered; we subjoin an abstract of the notices:—

"1. Captain Davenport's farm, on the east bank of the Hudson. It contains 350 acres, 100 of which are in wood: the soil is partly clay, partly sandy loam, and a large portion is a rich holm on the river side, of the finest quality. The price demanded is £7, 10s. per acre, and it was sold at somewhat more than that sum soon after. The returns might reasonably be expected to reach £112, 10s. *clear of expenses*, from the flat land; and £70 from the profit on a sheep stock on the upper portion of the farm; in whole £182, 10s. The price given was £2000, and £1000 more was required for building, fences, and drains—in all, £3000; for which there is a return of £180. An industrious Scots farmer, in Mr. Fergusson's opinion, would not fail to realize £200, clear of all the expenses of subsistence, &c.

"2. Next to this farm was that of Mr. Knickerbocker, containing 275 acres. There is a fine holm on this farm, and the upland seemed fully better than No. 1. It was let in shares last year, and the owner received £63. The price asked was £4 per acre, or £1100; and £200 more would be requisite for houses, fences, &c. There was no more timber than seemed requisite for the use of the estate.

"3. Mr. Cherney's farm, 106 acres, with wood sufficient for the use of the property—about 40 acres of very fine holm, capable of yielding, I was assured, forty or fifty bushels of oats, or other grain in proportion. This farm could be had for £530, and would certainly return £45 or £50 clear.

"4. Mr. Veley's farm, 118 acres; 40 acres of most superior holm; the upland good; with a stream running through it. The houses appeared to be new. This farm could be had for £400, and the return could not be less than from £35 to £40, clear of all charges.

"5. A farm of 300 acres, occupied by Colonel Grent, at a rent of 300 dollars (£67, 10s.) The soil is good loam; nine parts of it are clay: a new dwelling-house, and good barn, with a valuable wood lot. It might be bought for £1500.

"The whole of these properties were evidently susceptible of great improvement, though in foul and bad condition. The local situation is good, the Champlain canal passing within half a mile, though separated by the river.* The roads are tolerable."

The account given of these properties by an intelligent observer and agriculturist, will serve to convey an idea of the prices of land, and the returns of the capital and industry employed in American agriculture. In all cases we believe it to have been well proved, that no person should buy more land, however cheaply offered, than he can immediately cultivate with advantage. The capital expended in buying superfluous ground is completely locked up from use; and that circumstance, in a country where every disposable dollar can be employed with certain profit, is a downright and pitiable loss. There are some persons, indeed, who, as has been already mentioned, speculate in land, buying large quantities in order to sell it again, as it becomes more valuable by the increase of population; but such adventurers require to have well studied the natural advantages of the district, and it is not a speculation for emigrants.

To conclude, then, on this subject: Land in new districts, chiefly in the western states, may be had for a dollar and a quarter per acre; in places partially settled, unreclaimed land fetches from two to four dollars; in very favourable situations, perhaps a little more. Ground partially opened, and cleared of trees, is offered at all manner of prices, according to the labour bestowed on it, from four dollars to forty.

RENTING LAND.

There is little of what is called renting land in any part of the States; but where there is, the produce is generally divided into certain proportions between the owner and tenant. Sometimes each receives an equal share; sometimes the owner gets a third according to the improvements on the land, and its quality; sometimes tenants take land "*on shares*," with the landlord, on condition that he furnishes them with seed-corn and fire-wood; and then he receives one-half of the crop. In the western country of Illinois, &c., it is not uncommon for the owner to give a man "team, tools, and board, besides one-third of the crop," for labouring a farm. Mr. Pickering mentions that, in the neighbourhood of Baltimore, he was asked a rent of 18s. per acre for a lot of fifty acres, only half-cleared; for another lot of very rich land, the rent asked was twelve dollars, or £2, 14s. per acre.*

These lands had the recommendation of being situated near the markets of Baltimore; and it must be recollected also, in explanation of the high sums demanded, that the rent of land in America by no means bears the same proportion to its price as it does in England. With us, it brings twenty-five years' purchase of the rent. In America, it is freely sold at sixteen and seventeen years' purchase. This must be owing to the many profitable ways in which ready money can be employed in that country.

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* Flint's Letters from America.

† The experiments of Mr. Cobbett, while residing on Long Island, are an illustration of this remark. His mode of cultivating and preserving *ruta-baga*, turnips, and other green crops; his less expensive method of feeding hogs; his sheltering of poultry during winter, to procure eggs and chickens early in the spring; are all examples which were much needed in America.

* The rents asked in America are certainly higher than might be expected from *our* ideas of the relative proportions of the price of land and its rents in this country. But as Mr. Pickering, on whose authority we state the above facts, did not really take the land, and only inquired concerning it to gratify his curiosity, we are disposed to think a real bidder might have heard a lower price. In another place, Mr. Pickering says he was asked three guineas per acre of rent—a sum quite incredible *to be paid*.

CHOICE OF LAND FOR SETTLING WITH RESPECT TO HEALTH AND NEIGHBOURHOOD.

It is of the greatest consequence that the land which is selected be in a healthy situation, in whatever district it be chosen; and for ascertaining this, the emigrant must examine the spot himself. Let him trust the report of no other person; land-dealers and others naturally commend tracts of ground which they have an interest to sell. The people of the neighbourhood are also to be distrusted, because they are all anxious to have settlers near them, from the additional value an increasing population gives to their property. There can, however, be little difficulty in making the choice. In the first place, the neighbourhood of all marshes is to be avoided, as well as of rivers, which, from their sluggish course and low banks, appear to overflow and stagnate in time of floods. Such situations are almost always liable to agues and fevers. The same may be said of low moist prairies (meadows), whose great fertility should never tempt any settler from this country to establish himself in them. An elevated spot, where the air circulates freely from all points of the compass, is most desirable. If circumstances should induce the settler to fix himself near any of the great rivers, it is asserted that a residence chosen as near as convenient to the margin of the stream will be more healthy than those situated a few hundred yards' distance, in what is called the "interior of the bottom." Along the Mississippi and Missouri, the banks are generally higher than the ground a little distance inward; and from the porous nature of the soil, this interior land absorbs moisture from the river, and remains always damp. So much is this the case with regard to the Missouri, that all the waters which it receives from its tributaries do not increase the stream, which is, therefore, as large 1000 miles from its mouth as it is where it falls into the Mississippi, after having received more than a hundred rivers in its course. This circumstance is attributed chiefly to the water being absorbed by the porous soil, whence it is partially evaporated in the surrounding air. This peculiarity renders the immediate vicinity of the rivers (except where they have a rocky channel) unfavourable to the health of persons lately arrived in the country, and whose constitutions have not been yet accustomed to the climate and atmosphere.

To emigrants from Britain, we would say, that the country of Michigan and the Highlands of Pennsylvania are likely to be least injurious to their constitutions, and that more caution is required in selecting a situation in Ohio, Indiana, and Illinois—the whole western country indeed—than in the former places. That country, from the number of years it has now been settled, however, has been thoroughly explored, and all its healthy and unhealthy situations ascertained; so that a settler will seldom be at a loss, in the neighbouring towns, to find some clue by which to guide himself.

In whatever place a settlement be chosen, it is of the utmost consequence that the *house* be on a dry and airy spot, and that it have a spring, or clear running stream of good water, close by, for household purposes: some, to secure this object, pitch on the banks of a pool or small lake as an eligible situation, which is the worst place possible, both because the water is often stagnant and unwholesome, from the dead leaves and vegetables lying in it, and because the effluvia from such water is apt to generate disease in those who are constantly near it. The floor of the house should, if possible, be laid with some hard dry substance; and a little fire should be kept in the evenings, even when the weather hardly seems to require it, because this serves to maintain a wholesome circulation of air, and to dry more quickly the green logs of which settlers' houses are first constructed. With regard to clothing, it is of consequence that those who enter upon this new life should make themselves somewhat comfortable in this respect; and though they must for a time submit to hardships, by no means to imitate the savage affectation of many of their neighbours, who think that, as they are in the woods, they ought to take a pride in living like Indians. These people often neglect all cleanliness and comfort, both in their persons and dwellings, and are vain of telling how much they expose themselves to the weather, both in sun and dew, and how well they have stood it for years. Let none of these vain-glorious boastings have any influence with the new settler: he ought, in every point, to maintain habits as little removed from his former way of life as is consistent with his situation; keep his clothes and house as snug and comfortable as he finds it possible at the present time to make them; and expose himself neither to the weather nor fatigue, except where there is some useful purpose to be gained by it; never at least to do so for the mere sake of bragadocio, or to imitate the ostentatious hardiness of some of his neighbours. He will find the Scots proverb, "hooly and fairly gangs far," as true in the backwoods of America as at home. Steady and cautious perseverance in clearing his lands and securing his harvests, with patience and good humour under such privations as are unavoidable, are chiefly essential to the success of the emigrant.

As a farther advice to settlers entering into the woods or new lands, we would say, that if two or three can go together, it assists them materially: a family with several stout sons has a very great advantage in this respect. A few acquaintances joining together, and taking a piece of land to divide among them, can assist one another in clearing it, or in getting in their harvest; and if any accident happens in one of their families, the good offices of the rest serve greatly to relieve its inconveniences. It may happen, for instance, that some of them gets a hurt, or is laid by for a week with sickness; and if this were to occur during harvest, or in seed-time, every thing would be lost, without the assistance of the rest of the company If such partnerships cannot be formed before leaving home (which, when the emigrants are not from the same neighbourhood, cannot be expected), they may be and often are arranged to much advantage during the passage; and intending settlers will often find it advisable to sacrifice some of their own views as to the district in which they mean to settle, in order to have the assistance of steady companions elsewhere. Should no prospect of this kind occur, and should the emigrant resolve to choose a spot and settle for himself, his next object ought by all means to be to study the dispositions and characters of his nearest neighbours, and accommodate himself to them with cheerfulness and good humour. In return, he will almost always find them obliging, and ready to afford him information and assistance. Both after he is settled, and whilst on the voyage, he ought to avoid all bargain-making people, many of whom he will find, who have continually something to sell or to exchange, of the very best kind, as they say. These insidious bustling characters ought to be specially marked, and emigrants ought never to buy any thing but what they have already determined on, or see to be absolutely necessary.

AGRICULTURE, SOIL, AND NATURAL PRODUCTIONS.

In North America, oats do not produce nearly so heavy a crop as in Scotland; and wheat, though of excellent quality, is not quite so productive as it is here. Part of these deficiencies may be attributable to the careless cultivation of the Americans, but part also is undoubtedly owing to the difference of climate.

The grains usually cultivated are wheat and Indian corn. The former, with such cultivation as the Americans bestow on it, produces about 30 bushels per acre. The Indian corn yields 50 bushels per acre; this vegetable is cultivated in rows or drills, which are placed four feet apart, and hoed much in the same way as turnips

are here; the stalk grows to a great height, and affords in the leaves a kind of grass, which cattle eat with greediness. The corn is used as food for man in a great variety of ways—as bread, as porridge (when it is called *mush*), and in puddings. When unripe, and in the green pod, it is not unlike green peas, and in that state is sold as a vegetable. Horses, cattle, and poultry are all fond of this grain, and thrive well on it.

Potatoes are also cultivated, and yield very profitable returns—good land producing 300 bushels per acre. Wheat, however, is the most valuable crop; and though the produce is generally smaller than in Britain, the flour is of excellent quality. This crop usually succeeds maize, and is followed in succession by barley and oats, sown down with grass—although this rotation is as frequently inverted; and as maize is a culmiferous plant itself, it is not thought by observers from this country so useful in preparing the ground for wheat as our green crops are. With good management, oats yield from 40 to 50 bushels, and barley about one-fifth less. Rye and buckwheat are more generally cultivated than in Britain. Buckwheat cakes are one of the standing dainties of an American breakfast. The process of manuring is much neglected, both as regards the use of ordinary stable manure, and of lime and gypsum. The Americans say that the labour required in the application of manure would be so expensive, from the high wages of all their servants, that the returns would not be profitable. But the truth seems to be, that they are more familiar with the process of breaking up new land, of which they have abundance generally within reach, and that they have never yet given manure and scientific agriculture a fair trial. Mr. Stuart of Duncarn calculates, that under their present system of management (the slovenliness of which is universally remarked), the average crops of all sorts of grain, maize excepted, are nearly a half less than in Britain. The climate is favourable for the making of hay, which yields a good return. Turnips, ruta-baga, peas, lucerne, are all cultivated to advantage.

The author of the "Stranger in America" thus speaks of the farmers in the state of New York:—"The American farmer generally owns the land he cultivates, in fee simple; what he gains is his. He is intelligent, thinks, and knows how to converse on his affairs. I have never received from one a stupid answer. He loves his country, yet has no especial attachment to the peculiar spot of his birth, which, however, I believe nowhere exists in any great degree, except where the farmer cannot move. If he sees before him a noble country, where he can buy for a dollar and a quarter an acre of ground, yielding abundant crops, and affording him the greatest pleasure a farmer knows, that of seeing a fine soil answer to his labours, it would be strange indeed were he to remain on a jealous earth, which seems to grudge the husbandman his well-earned reward. A proof of this may be found in the emigration by thousands and thousands of European peasants. On the whole, the American farmers are a hardy and well-disposed race. That you should not seek for refined and minute husbandry among the farmers in the west, who have to plough between the stumps, because the labour to dig them out would cost more than would be gained from the spots thus obtained, is evident; and that, moreover, the facility with which a farmer can here obtain land, sometimes induces him to commit the common fault of farmers, of husbanding too much land, and thereby scattering his means, you may easily imagine. It is necessary to travel but a short distance towards the west, to be convinced how erroneous the frequent assertion is, that the Americans are more a commercial nation than any thing else; they are, on the contrary, thus far essentially agricultural, that not only the vastly greater part of them are farmers, but also that their disposition is fitted for the farmer's life. Every American loves farming. In this the Americans resemble the ancient Romans and the English, not the Greeks, who never were famous farmers. If I say you should not seek for refined and minute husbandry here, I speak of the west alone. In some parts of the same state of New York, which have been settled for a long time, and where the price of the land is not so exceedingly low, it compared to the price of labour, farms are found which are managed with minute care, in all the different branches of husbandry; so that the farmer does not only compete with the cultivator of the soil in other countries, as to his chief article, wheat, but even butter is exported in considerable quantity from the farms along the Hudson, or near it. Some of the best butter, called Goshen butter, is exported to Malta and other places of the Mediterranean, where the best kind brings as much as a halfpenny per pound more than the best English or Irish butter. This I have been told by a gentleman who had long resided in various ports of that sea. So we go—American butter sent to the shores of antiquity!

"In the west of New York, probably, nine farms out of ten are owned in fee-simple, though many (perhaps as much as a third) are subject to mortgage. A lease is seldom for more than ten years, and for a rent in kind, or money, or wheat alone. The proportion of produce given as rent is, with few exceptions (I speak here always of the western part of New York), one-third of the grain and one-half of the hay. This proportion is delivered to the lessee, ready for market, on or near the premises. On fine wheat land it amounts to about two dollars and a half per acre, for all the farm not in timber. Many recent leases are at about two dollars per acre for the cleared land. One-third or fourth of a farm is generally reserved in timber. One hundred acres is the magnitude of fair farms. Those persons who occupy less, carry on, besides, some trade, or take jobs and work on larger farms; few farms exceed five hundred acres. Many consider the largest farmers the best cultivators: and the character of the cultivation is here, of course, as everywhere else, governed by the relation between price of labour and price of land, as I said before. Throughout the United States, as compared with Europe, labour is dear and land cheap; and it is this which causes difference in American cultivation and agricultural improvements, and not, as is not unfrequently supposed, a want of industry or capacity for business in the agricultural population. It is very obvious that a farmer upon one of the western prairies, who gives one dollar and twenty-five cents per acre for his land, seventy-five cents per day to his labourers, and gets for his corn from ten to twenty cents per bushel, must adopt a different mode of agriculture from the European cultivator, who pays for his land many pounds per acre, a few pence per day to his labourers, and who gets for his products from ten to twenty times as much as the western farmer. Reverse the case, and let the English farmer pursue the American mode of cultivation, and *vice versa*, and one would be ruined about as soon as the other. Each must adapt himself to the given circumstances, and only thus can prosper. At least nine in ten of farm-labourers in the west of New York, purchase or lease farms by the time they are twenty-five years of age. A majority of them go to the west, after having accumulated from 200 to 500 dollars, and purchase government lands."

The following notice of the produce of some *well-cultivated* land, in the northern part of the state of New York, will give an idea of American agriculture:—

10	acres of	orchard ground	produced	25 tons hay.
20	"	maize	"	1580 bushels.
4	"	wheat	"	140 "
1	"	flax	"	600 "
8	"	oats	"	560 "
1	"	barley	"	60 "
2	"	potatoes	"	1000 "
2	"	vegetables fattened		100 chickens.

Much of the industry of the American farmers is exercised in rearing cattle, hogs, and poultry, for the market of the towns. The hogs are fed a good deal on Indian corn, and the abundance of that kind of grain often makes it be given to them, when they might be fattened on much cheaper stuff. The rearing and feeding of cattle is carried on very systematically, and to a great extent; there being drovers, as in this country, who purchase the beasts from the farmers, and often drive them as far as 600 miles to be sold. New York consumes about 700 oxen per week; these weigh on an average 55 stones of 14 lbs.; and the butcher pays for them from £12 to £14 per head. Men employed as drovers receive 4s. 6d. a day, with food for themselves and cattle. It is allowed that a great deal might be done in all the states to improve the breeds of fat cattle, who, though always in good condition, often take more care and more feeding to bring them into that state than some of the profitable English kinds would do.

The horses of America are highly praised by good judges. Mr. Fergusson of Woodhill says (speaking of those in New York state), that he seldom passed a farmer's door without noticing horses, which, for their action and figure, were worthy of being transferred to any gentleman's stud. They are, he adds, kindly treated, well fed, and *remarkably* docile. They are in general about 15 or 15½ hands high. Those of settlers in the less improved parts of the country are, of course, a smaller and inferior breed, but hardy, tractable, and easily fed and stabled.

The sheep of New York state are Saxon and Merino, and the wool brings 2s. 8½d. per lb. in good years; in others, only 2s. 1d. They raise fine crops of turnips (where this management is attended to), and rear many sheep, the prices fluctuating: a ewe fetched in 1831, 9s.; the year before, only 4s. 6d. Some farmers brought a sheep-doctor from England, and gave him 27s. each 100 sheep, for his attendance to this kind of stock only.

The prices at which farm produce sells vary exceedingly in different places, according to the demand and the distance from markets. In New York state, wheat brought 1 dollar to 1½ dollars per bushel; maize, 2s. to 2s. 6d.; oats, 1s. 2d. to 1s. 6d.; barley, 2s. 8d.; potatoes, 1s. 3d. Good ordinary horses, £20 to £25. Oxen, per pair, with yoke and chain, £20 to £30. Cows, £4, 10s. to £6. Merino sheep, 9s. to 18s.; Saxony, 13s. 6d. to 43s.; common sheep, a sort of coarse small Leicesters, 4s. 6d. to 9s., after shearing. Brood sow, £2, 5s. to £3, 10s Hogs, 1d. to 1½d. per lb. on live weight. Geese, 2s. 10d. a pair. Turkeys, 2s. 1d. each. Fowls, 6½d.—*Utensils* cost—Farm-wagon, £13, 10s.; ox-cart, £10; ploughs, £1, 10s. to £1, 16s.; good double harness, £18.

Dairy articles, from the labour and attention they require, are high in proportion to other things; and, from the same cause they do not pay the farmer so well, nor are they so much attended to.

Orchards are a matter of considerable attention in America, and apples, peaches, and cherries, thrive in the greatest beauty and luxuriance. The orchard itself is a considerable ornament to a farm-house, and its fruit can be disposed of to advantage, either fresh or preserved, if near a town: and if not, it yields a luxury to the farmer and his family, which their whole earnings could hardly purchase in this country. Little attention is paid to the appearance of gardens, which are in general ploughed, labour being too dear to admit of spade husbandry; the Americans, indeed, scarcely know how to handle this instrument.

Many parts of the Union are highly propitious for the growth of flax and hemp, the hemp of Kentucky being found not inferior to that of Riga. Hops thrive well in New England. The rearing of the silk-worm is a profitable occupation in Connecticut. Cotton, tobacco, rice, indigo, and sugar, may be said to form the staple products of the more southerly states. The vine, which seems to be indigenous to America, and is found in the forests has within these few years been successfully cultivated in Indiana, and in many other parts of the western states, the first cultivators being a body of Swiss settlers. Of one of these vineyards, Mr. Flint thus speaks:—

"We have witnessed nothing in our country, in the department of gardening and cultivation, which can compare with the richness of this vineyard in the autumn, when the clusters are ripe. Words feebly paint such a spectacle. The horn of plenty seems to have been emptied in the production of this rich fruit. We principally remarked the blue or Cape grape, and the Madeira grape. The wine of the former has been preferred to the claret of Bordeaux."

In the northern states, farmers make sugar from the maple tree; and as the produce is of excellent quality, and cheaply procured, this becomes a branch of industry well worth attending to, at least for domestic consumption.

There are some fruits cultivated in the United States which are not known in this country. Among these is the papaw-tree, which is not uncommon in the bottoms which stretch along the rivers of the middle states, but is most plentiful in Kentucky and the western parts of Tennessee. It attains the height of twenty feet, and about four inches in thickness. The fruit resembles a cucumber, and, when ripe, is of a rich yellow: the pulp resembles egg-custard in consistence and appearance; it has the same creamy feeling in the mouth, and unites the taste of eggs, cream, sugar, and spice. It is exceedingly nutritious, and in its native woods was a great resource for food to the Indians. So many tastes are compounded in it, that it is said no person at first eats it without being tempted to laugh at the unexpected and whimsical combination. The *persimon* is another fruit not known in this country, which grows to considerable perfection near New York: the ripe fruit is about as large as the thumb, of a reddish complexion, round, fleshy, and furnished with six or eight stones; but it requires to be mellowed by the first frost before it be eaten, when it becomes very palatable. The fruit is produced in amazing abundance, and is used either for eating from the tree, for making a kind of beer, or for distillation. The tree, however, is not, upon the whole, more advantageous than the apple and peach.

There are few persons established on farms in the States who have not access to some stream in their neighbourhood for fishing, if they are fond of that pursuit, either for amusement, or as a means of providing food for their families. Every one has the privilege to avail himself of all the treasures of the waters, without let or hindrance; and they are worth taking advantage of. The shad and the salmon, of excellent kinds, abound in the rivers of the eastern states, and beautiful trout are taken in those of the north. Among the fish of the western waters are noticed the perch, one of which, the buffalo-perch, is a fine fish for the table, weighing from ten to thirty pounds. The pike, the perch, and other fish of the Illinois, and the rivers connected with it, are represented as excellent: a line called a trot-line, drawn across the mouth of the Illinois, with hooks at regular distances, took five hundred pounds in one night. The whole of the fish of the Mississippi are not, however, of equal quality for eating; the kinds which are chiefly admired are the trout, the small yellow cat-fish, the pike, the bar-fish, and the perch.

In recounting the privileges of the farmer, it would be improper to pass over the game, which is abundant in the American woods, and which may sometimes afford amusement, sometimes an agreeable variety of food. The mallard, or common wild-duck, is found in every fresh-water lake and river of the United States. The canvas-back duck is an American species, altogether

unknown in Europe; they are found in the rivers Hudson and Delaware, but principally frequent the waters of the Chesapeake, where they feed on the roots of a certain grass-like plant abundant in these streams: they float about in shoals, but are exceedingly shy, and difficult to be shot. The delicacy of their flesh, and the high price they bring in towns, render them an object of lucrative pursuit to numbers. In general, however, with regard to game of all kinds, though plentiful and excellent, it is no object with the colonist, who does not care to waste his time in following it. Mr. Fergusson of Woodhill met in Canada with a young Scotsman who had been a poacher in Scotland, but was now settled and thriving well on a farm of one hundred acres in his new country. Mr. Fergusson said to him, "You will need neither certificate nor qualification here: what do you principally shoot?"

"Indeed, sir," said he, "if you'll believe me, I scarce ever think about it, for there's naebody here seeks to hinder us." A herd of deer, only two days before, had wandered past him while at the plough, yet Walter felt no inclination to run for his rifle, though it stood loaded in the house.

WAGES OF LABOUR, AND COST OF LIVING.

The price of articles varies in different places, so that no general average can be stated either of wages or of the cost of living: both are different in different circumstances. But we have selected, from the best authorities, such lists, for several of the chief towns and districts, as will enable the reader to judge for himself.

Albany.—For Albany, on the river Hudson, we have, from good authority, the following statement:—

Wages.—Men for general farm work—Summer, £2, 5s. per month; winter, £1, 7s. per month. Harvest work, cradling wheat, 4s. 6d. per day. A cradle scythe is said to cut four acres a day, and requires one man to find to each cradler. Hay cutting, 2s. 7d. per day. Board found besides to all these. A steady active farm overseer or bailiff has about £45 money wages, a capital house, a cow, and some other advantages. A man gets 8 guineas (or 21 dollars) for three weeks' work drying hops. Good cooks, 18s. to 27s. per month; chambermaids, 13s. 6d. to 18s. per month; washerwomen, 4s. per day; servant girls, 18s. to 24s. per month.

Provisions.—Wheat, 6s. 9d. per bushel; beef, per quarter, 18s. to 23s.; per lb., 2d. to 4d.; mutton, 1½d. to 2d.; veal, the same; pork, 22s. to 27s. per cwt.; butter, 5d. per lb.; cheese, 2d. to 4d. per lb.; eggs, 4d. to 5d. per dozen. Brandy (French), 4s. 6d. per gallon; gin, 3s. per ditto; whisky, 1s. to 1s. 1d. per ditto; excellent table beer, 4s. 6d. per barrel of 32 gallons. Firewood, 13s. 6d., country price; 22s. to 27s., town price, per cord of 128 cubic feet, delivered four feet long, and cost 2s. per cord to cut to lengths required for use.

"The American farmers," says Mr. Fergusson, "live comfortably, and at a very moderate expense. Candles and soap are generally manufactured from kitchen refuse. A good housewife assured me that the butcher-meat for her family, fifteen in number, did not exceed, *in whole*, 1s. per day (three meals), except when she allowed them turkeys and other poultry, when she reckoned the expense at 2s. 6d. The flour consumed did not exceed 4s. 6d. per week. They have fruit, both fresh and preserved, in the utmost profusion; and the cider barrel is always ready broached. A good many articles of clothing are spun and woven at home; and the geese are subjected to periodical contributions, towards the bedding of the household, or the feathers are sold at a good price."

Baltimore.—Mr. Pickering, who went to this town to look for a situation as overseer of a farm, mentions the following prices as current there:—

His own lodgings and board, at a respectable shipcarpenter's (including washing and mending), 13s. 6d. per week.* In the markets, beef, 2d. to 3½d. per lb., the best cuts, 4½d.; pork from 2d. to 3½d. per lb., and sometimes lower; veal and mutton, by the quarter, 1s. 2d. to 2s. 3d.; good lamb, 4d. per lb. Turkeys, 1s. 2d. to 2s. 3d. each; fowls, 6½d. to 9d. each. Cabbages (drumheads), 1d. to 2d. each; potatoes and turnips, 10d. to 14d. per bushel. Wild-ducks, 3½d. to 5d. each; the canvas-back duck, a large bird, and esteemed a great delicacy, 13d. to 18d. each; partridges, 4d. to 7d. each; quails, 1d. to 2½d. each; hares and rabbits (small), from 6d. to 1s. each; shad (a fine fish like a herring, but ten times the weight), 13d. to 18d. a pair. Apples, very fine, 13d. to 2s. 3d. per bushel; green peas, 1s. to 1s. 8d. a peck.

Ship-carpenters' wages from 7s. to 9s. per day, which was higher than the usual rate, on account of a great demand for hands at the time. A young man, bound apprentice to a shipwright, had 13s. 6d. per week, wages for first year, and 22s. 6d. per week second year, to board himself.

Philadelphia.—In the "Price Current" of Philadelphia we find the following rates given on wholesale articles:—Mess beef, per barrel of 196 lbs., 45s. to 47s. 2d.; butter, per lb., 4½d. to 5d. (best quality); biscuit, best, per lb., 2d.; mould candles, per lb., 5½d.; dipped candles, 4½d.; cheese, in casks, 3d. to 4d.; coffee, 5½d. Brown shirting, 3d. to 4½ per yard. Flour, superfine, per barrel of 196 lbs., 20s. 1d.; Indian corn meal, per 196 lbs., 15s. 1d.; hams, 5d. to 5½d. per lb.; honey, per gallon, 2s. 1d.; loaf sugar, per lb., 6½d. to 8d.; brown sugar, 3½d. per lb.; brandy, per gallon, 7s. 2d.; Virginia tobacco, 1½d. per lb.; Cuba tobacco, 5½d. per lb.; wine, Madeira, per gallon, 5s. 2d. to 13s. 6d.; Port wine, per gallon, 4s. 6d. to 5s. 9d.

These are the wholesale prices; articles of provision are furnished in the markets as follows:—The best beef from 3½d. to 6½d. per lb., according to what part of the animal is selected; fat mutton, of excellent quality, 3d.; chickens about 2s. 1d. a pair; turkeys from 3s. 6d. to 7s. a pair. Butter varies, according to the time of the year, from 6½d. to 18¾d. per lb., averaging about 12½d. Superfine wheat-flour, 19s. 8d. per barrel of 196 lbs., kidney beans, 1s. 1½d. per peck; cherries (good), 2½d. per lb.; good rye whisky, 1s. to 1s. 2d. per gallon; corn ditto, less.

As to the prices of labour in Philadelphia, and the surrounding country, we find it stated, that a labouring man gets from 3s. 2d. to 4s. 6d. per day, in the cities; and at farm-work, in the country, he receives from £1, 16s. to £2, 14s. per month, besides board and lodging. An attentive, handy servant-girl is readily engaged at 4s. 6d. per week (besides her board, of course).

New York.—The provision market here seems to be cheaper than that of Philadelphia, as we find the best beef quoted at 2d. per lb. Journeymen mechanics are hired at 6s. per day, and some that work by the piece earn 8s. per day. House carpenters, bricklayers, and brick-makers, find ready employment (except in the dead of winter), at 4s. 6d. to 7s. or 8s. per day; and shoemakers, tailors, and persons well acquainted with any common or useful trade, easily find work, according to these rates. It must be remarked, that tradesmen in America work long hours, that is, from sunrise to sunset. Mr. Stuart of Dunearn says of this circumstance, that he does not think the employer gets any additional work done by it, the people being much more disposed to loiter than when the hours are shorter. It may be remarked, also, that the long summer day at New York is about an hour and a half shorter than that of London.

* The living was—a roast turkey once or twice a week, fowls, beefsteaks, ham, sausages, and a kind of pudding; pies, soup, fish, &c. A variety of the above was placed on the table at every meal, and generally three kinds of vegetables with coffee or tea at breakfast and supper.

Farm-labourers in New York get from ten to twelve dollars a month, with bed and board, including washing. A married man receives from 95 to 120 dollars a year instead of board, and he pays about 20 dollars for a house and garden.

With regard to prices generally, it deserves to be mentioned, that those of imported articles, such as tea, sugar, coffee, &c., are higher in places at a distance from the sea and the great towns, and that articles of home provision are cheaper there. This arises from the expense of carriage in both cases, what is produced and sold at home having always less charges on it than what is brought from a distance. Clothing is rather dear in the States, especially woollen; worsted stockings and worsted mits, for instance, are considerably higher than in England.

These notices will serve to convey an idea of the cost of living and of wages in most parts of the eastern states, where emigrants first land. They will be found to vary, as we have already mentioned, in different places, and according to circumstances; but it appears generally that there is full employment for labour, with wages according to the kind of business, from 3s. 6d. per day, with board, to 9s. per day without board, the most laborious or most ingenious trades receiving the highest remuneration. The cost of living may be inferred from the prices of beef and wheat—the former varying from 3½d. to 4d. per lb., according to the quality or the demand, the latter generally about 4s. 6d. per bushel, or 18s. per boll.

Western States.—We find the following list given for the prices at Cincinnati, on the Ohio, which may be reckoned the capital of the west, and is the point to which emigants first direct their steps in that quarter.

Flour, 9s. per cwt. of 112 lbs.; Indian corn, from 6½d. to 8d. per bushel; mutton, 2d. per lb.; cider, 4s. 6d. per barrel; bacon, 2d. and 2½d. per lb.; shoulders, 1½d. per lb.; hams, 2½d. per lb.; freesold butter, 2½d. and 3d. per lb.; mould candles, 5½d. and 6d. per lb.; dip candles, 4½d.; coals, 4d. and 4½d. per bushel afloat, 5d. and 6d. in the yard; coffee, 8d. and 9d. per lb.; teas, 1s. 6d. to 2s. per lb.; sugar, 4d. to 5d. per lb.; copper sheeting, 18d. per lb.; old copper, 9d. per lb.; cigars, 20s. per 1000.

EXPENSES OF TRAVELLING.

Mr. Pickering, to whom we have formerly referred, travelled in search of a situation as land steward, and has been particular in noticing the expenses of his journey. The following are some of his notes:—From Philadelphia, via Brunswick, N. J., to New York, partly by steamboat, and partly by coach, 96 miles, 11s. 3d., luggage included; dinner on board, 3s. 4½d.—the fare, fish, flesh, fowl, puddings, pies, tarts, brandy, &c. On landing at New York, he got lodgings, after some search, at a tavern, where he paid for lodging 6½d. per night, and 13½ for each meal; five beds in the room he slept in. Went on board the steam tug-boat for Albany; the fare 4s. 6d., one trunk included, and paying 1s. 1d. for the other. In the steamboat the fare is higher; the distance is 145 miles: he took provisions with him for 24 hours, as did the rest of the passengers. From Albany he took passage in the canal to Lockport, near Lake Erie, distance 360 miles—fare, a little more than one penny per mile for himself and one trunk, paying 3s. 4½d. for the other, which weighed 75 lbs. Passed over a ferry on the Niagara river, to Canada—charge, 13½d. This was in the year 1826.

Mr. Fergusson of Woodhill travelled the same route from New York to Albany, some years later (1831). The charges of freight were then considerably lower: he went in the cabin of the North America, a magnificent steamboat, and paid only 9s. fare for the whole 145 miles, with a very moderate charge for meals—being 2s. 3d. for dinner, including brandy, whisky, and Hollands, placed on the tables at the discretion of the passengers He returned from Canada by the Erie Canal to Rochester: the fare from Buffalo to Rochester, 94 miles, 15s. 9d., three capital meals included—the boats good, the cabins amply supplied with books and pamphlets, and the tables with good cheer. Travelled by hired coach from Geneva to Albany, 170 miles, £1, 11s. 6d. No extra charges given to coachmen or other persons.

Mr. Fergusson afterwards went from New York to Washington, and found the charges as follows:—From New York to Philadelphia, by Bordentown (where Joseph Bonaparte lived), by steam, with 30 miles of land-carriage, 18s., including breakfast and dinner; went in the William Penn steamboat from Philadelphia to Baltimore, 120 miles (going through the Delaware and Chesapeake Canal, 14 miles), fare 18s.—breakfast and dinner, both excellent, were charged 2s. 3d. each. From Baltimore to Washington in the stage-coach, 38 miles, fare 13s. 6d.: got a neat light coach, a pair of sleek well-fed horses, and a black driver to go to Mount Vernon (the former residence of General Washington), a distance of about 12 miles—fare, 13s. 6d.

In the account of travelling expenses, it must be noticed, that passengers may always carry their own provisions when in steamboats, or canal boats, and by that means reduce the amount very considerably.

MANNERS OF THE PEOPLE, AND THEIR CONDUCT TOWARDS STRANGERS.

We have now presented a fair and impartial view of the United States of America, as regards their suitability for the purposes of intending emigrants. As the preceding information has been very carefully drawn from every accessible source, and rendered as complete as possible, nothing remains to be mentioned which can concern the interests of emigrants, unless it be a few observations on the manners of the people they have an intention of residing amongst.

Few persons know or care about those little peculiarities of speech or manner in which the people of one county or district differ from those of another; as, for instance, in what the dialect of the natives of Yorkshire differs from those of London, or that of the people of the south of England from the same class in the north of Scotland. These matters are of very slight importance to the comfort of a stranger going to reside among them; but it is of some consequence for him to know if the new people with whom he is going to pass his life are kind and hospitable to those who come among them, or if they are jealous and intolerant in their manners, and disposed to repel the advances of strangers. There are many such people who look on all new comers as intruders, and take every means to make them feel that the country they have come to belongs to others. Is this the case with regard to America? may be naturally asked by emigrants who think of proceeding thither. On this subject we might appeal to the many invitations which are daily circulated by the Americans and their friends, calling on all who are destitute of employment and subsistence in Europe, to come freely to that country, where they are assured of cordial welcome and abundance. But the following extracts from the journal of Mr. Fergusson may show how our wealthy travellers are received there; and we shall then subjoin a similar specimen of what the poor are to expect.

"I could say much," says Mr. Fergusson, "were it proper, of the hospitality of New York, and of the unostentatious kindness with which my letters of introduction were received. The style of living is elegant and comfortable, and the domestic circles which I had the pleasure of joining seemed truly unaffected and happy. The quiet, modest, and amiable tone of female society particularly pleased me."

We give a second extract from the same traveller. "I learned also, from a Scotchman in Mr. Thorburn's employment, whose family had suffered heavily from sickness last winter, that flowers and parties by no means engross the sole attention of the ladies of New York. He assured me, that within his own observation, it was quite wonderful what they continued to do, in visiting, clothing, and attending to the poor. This man left Glasgow in great destitution about a year ago. He is now in comfortable circumstances, and his family provided for; but the first fortnight which honest Saunders Lee spent in New York, a total stranger, without money or engagement, he described with a shudder, as '*perfectly awful.*'"

The following extract is from the letter of a female emigrant, whose husband had fallen sick on his arrival:—"We hired a room, and my husband bought a saw, and went sawing wood, and doing any thing; and we thought we should get through the winter pretty well; but after about three weeks, he was taken ill, and it proved to be a typhus fever. We had no parish to apply to for relief; but you would be astonished at the friends we have found; for people that were quite strangers have called to know *if the sick Englishman lived here;* one kind gentleman sent for a doctor, and another good old Methodist gave me leave to go to the grocer's for any thing in his name; and others were equally kind. I never thought I should meet with such friends among strangers. Husband is now mending fast."

Mr. Flint says—"To-day a vessel from Dumfries arrived; and a few minutes after she was moored, one of the brothers Messrs. Ronaldson went aboard, making inquiries after the views and circumstances of the poorer classes of emigrants. He employed one of them, pointed out where several others would find work, and gave advice to the rest. This is not a new or rare instance of benevolence on the part of these gentlemen."—"Every day numbers of European emigrants are to be seen in the streets [of Philadelphia]; I have never heard of another feeling than good wishes to them."

It is frequently mentioned, that difference of rank or of wealth is not so much thought of in America as in this country, and that the industrious labouring man stands more nearly on an equality with his employer than with us. The following extracts relate to this subject.

Extract of a letter from a labourer:—"A person must not think of coming here without working, and they despise drunkards; but if a person keeps steady, he is respected much more than in England; he is admitted at table with the farmer."

The following extract is illustrative of American manners in various respects. It is from Mr. Stuart:—"When they meet us walking, they, whether acquainted with us or not, frequently stop their vehicles, and very civilly offer us a ride with them, and will hardly believe us to be serious when we decline to avail ourselves of their kindly meant invitations, and tell them we prefer to walk. There are few more striking points of difference between this country and Britain, than in the numbers of people who ride and walk on the public roads. It absolutely seems disgraceful to be seen walking. The circumstance, no doubt, proves the easy circumstances of the mass of the people, as well as the value of time to a mechanic, whose wages may be from one to two dollars a day, and who can better afford to pay for a conveyance and spend less time, than to walk and spend more."—"We have not hitherto," he adds in another place, "seen any thing like a poor man's house, or a beggar, or any one who did not seem well clothed and well fed."

Such are some of the traits of character of the inhabitants of North America, who, although speaking the English language, and living under institutions strictly English in their character, differ, as may be supposed, in several respects in their manners from the people of this country. They do not lay claim to that artificiality and polish which distinguishes what is called "good society" in Great Britain; they are more downright and frank in their behaviour, less ceremonious, and are in every way a more independent people in their thoughts and actions than the generality of English and Scotch. From all that we can understand of their character, they seem to possess less of the quality which produces "cringing" than any people on the surface of the earth. It may be conceived, from the extraordinary mixture of classes of persons from most European countries, and the wide field offered for adventure and enterprise, that the Americans have little of that staidness of disposition and subdued tone of mind which are characteristic of the British nation. Society, in the partially settled districts, is therefore still in a loose condition; and emigrants will require to be more alert in regard to their interests, and much more on their guard against deception, than in this old-established country. It is deeply to be regretted, that, for a number of years, there has been a class of writers in Great Britain, and a few travellers, whose deeply-rooted object it has been to vilify the American nation in the gross, and to hold up not only their institutions and usages, but all that belongs to the country, whether in nature or art, as fit subjects of ridicule and contempt. The unworthy calumnies which have been industriously circulated by these splenetic writers, need not in the smallest degree produce hesitation among emigrants in reference to settling in the United States. The citizens of the North American Union are essentially British in their origin and character. Their other peculiarities have naturally arisen from the fortunate circumstances under which they are placed; and in which peculiarities we would equally partake, had we fewer public burdens, fewer causes to be careworn, as well as a greater scope for the profitable exercise of our industry. In comparing Canada with the States, every intelligent traveller allows, that the citizens of the Union are infinitely more active than the subjects of Great Britain. Within the colonial territories, all public works, and most of the settlements, proceed slowly, the system seeming to be rather inert; while on the States' side of the boundary, every species of work proceeds with the most astonishing rapidity—canals being cut, railways formed, and towns built, in an inconceivably brief space of time. As Upper Canada has nearly the same natural advantages as the States, and as the people, it may be presumed, are as well educated and as generally intelligent, it would seem that the true cause of the difference we specify is in the mode of conducting public affairs. It may be conceded, that the provinces are as well managed as they could possibly be; but it must also be allowed, that it is not in the nature of things that a country, with its seat of government three thousand miles distant, can be so advantageously conducted as another country where the government is not only on the spot, but consists of the people themselves. It is not, however, our object here to draw any comparison between the political condition of the colonies and States. Both have free institutions, and both possess those capabilities which can yield comfort to settlers. The honest, the industrious, and the enterprising, will do well in either, and will command respect and ascendency wherever they may fix their place of settlement.

EMIGRATION TO AUSTRALIA.

AUSTRALIA is an island of extraordinary magnitude, forming the chief of a group lying off the southern coast of Asia, and collectively termed Australasia. Next to the great continents composing the four "quarters" of the world, it is the largest mass of land of which we have any certain acquaintance, being in length from east to west 2000 miles, and in breadth from north to south 1700. It lies between 9° and 38° of south latitude, and 112° and 153° east longitude. Australia was discovered by the Dutch in 1616, and from them it received the name of New Holland, which is now generally disused. The Dutch having done little more than merely point out the island, it was afterwards visited and more carefully examined by several English navigators, and among those by the celebrated Captain Cook, who bestowed upon its eastern coast the name of New South Wales. Its distance from Great Britain is 16,000 miles by ship's course. Australia has a few small islands near its shores; and one of larger dimensions on the south, called Van Diemen's Land, from which it is separated by a channel named Bass's Straits.

The physical geography of Australia is in some respects peculiar. The country, taken as a whole, and as far as it has been explored, exhibits less hill and dale, with less compact vegetation, than most other parts of the world. At different places there are extensive ranges of mountains, between which and the sea there are generally some fertile valleys; other parts of the coast are flat and sandy; while the greater part of the interior is said to consist of extensive plains, with rising terrace-like land, and low ridges of hills, with open forest. Nowhere are there any dense forests like those of North America; the timber is for the most part thinly scattered, and the scenery has in numberless places been compared to that of a gentleman's park in England. The herbage in nearly all quarters, except the fertile valleys, is thin, and what in England would be called scanty; yet there are spots in which the vegetation is exceedingly beautiful. Australia has a variety of rivers, great and small, as the Hunter, the Hawkesbury, the Macquarrie, Lachlan, Murumbidgee, &c., but they all less or more possess the peculiarity of being subject to great flooding at certain seasons, and being very low at others; consequently, none can be said to be navigable for any great length. Some of the rivers are liable to be so greatly dried up in summer, that they cease to flow, and their course is only known by a series of pools, from which alone water is to be obtained. A natural result of this general deficiency of irrigation, is the scanty herbage already noticed, and the adaptation of the land more to pasturing than to agriculture. It is to be remarked, however, that the coarse scanty grasses are extremely nutritious; those named cat-grass and kangaroo-grass are distinguished for their fattening qualities for horses, cattle and sheep.

In a late expedition into the interior, from the eastern coast, Captain Sturt advanced towards the north beyond the 145th meridian, and on the south beyond the 140th, and found "that the country preserved, as far as he was able to see from some hills, the same uniform appearance of an immense level plain. This extensive country resembles as little the plains of South America, covered with abundant grass, as the African Sahara, with its moving sands: it seems to approach in character to the wide steppes which surround the lake of Aral, and extend to the Caspian Sea and the Ural Mountains. But we are inclined to think that they are somewhat better adapted to sustain inhabitants than the steppes of Asia. These plains of Australia are, in many parts, extremely level; in others, they are slightly undulating; and here and there, but at great distances, sometimes of more than a hundred miles, a sandy eminence rises, which hardly deserves to be called a hill: the loftiest of these eminences are not above 300 feet higher than the plain on which they stand.

"All over this extent of country the soil presents only two varieties: it is either a red sandy loam or a white coarse sand. In some places it is entirely destitute of vegetation, in others it nourishes only salsolaceous plants, without a blade of grass between them. Others, again, are covered with polygonum, a gloomy and leafless bramble; and in a few tracts patches of ground are discovered, which appear to be moist, and in which the calystemma is abundant. Such patches probably form quicksands in the rainy season. Those parts of the plains which seem to have the best soil, produce stunted gum-trees and cypresses. Large tracts of country are covered with shells and the claws of cray-fish, and this soil, although on alluvial deposit, is superficially sandy They bear the appearance not only of being frequently inundated, but also of the floods having subsided upon them. On their surface no accumulation of rubbish is observed, so as to indicate a rush of waters to any one point; but numerous minor channels are traced, which evidently distribute the floods equally and generally over every part of the area which is subject to them.

"My impression," says Captain Sturt, "when travelling in the country to the west and north-west of the marshes of the Macquarrie, was, that I was traversing a country of comparatively recent formation. The sandy nature of the soil, the great want of vegetable decay, the salsolaceous character of the plants, the appearance of its isolated hills and flooded tracts, and its trifling elevation above the sea, severally contributed to strengthen these impressions on my mind."*

The conjecture of Captain Sturt, that Australia is of a more recent formation than the rest of the globe, is by no means singular, but how far it is correct it is here unnecessary to inquire. It is at least remarkable, that nature has, in several instances, put on very different forms in Australia from what are customary elsewhere. Among the animal tribes, the chief are of the pouched kind, and move forward by springing. The kangaroo is the principal animal of this description, and there are different kinds of it; some are from four to five feet in height, when sitting on their hind legs. They will, in some cases, leap twenty feet at a single bound, by which odd species of movement they are able to outstrip a horse at full gallop. This interesting and pacific class of animals is fast diminishing in numbers; they are now seldom seen in the settled parts of the country. Opossums are numerous. There is an animal half-bird, half-beast, or possessing the bill and feet of a duck, and the body of a mole or rat (ornithorhyncus paradoxus). Wild savage animals are unknown, the native dog excepted, which has been pretty well hunted in some quarters. Of birds there are some singular varieties, both large and small. There are, in particular, a great variety of parrots, parroquets, and cockatoos, all with exceedingly beautiful plu-

* Penny Cyclopædia.

mage—green, red, purple, and white. The doves are equally splendid in their feathery coverings. There are several kinds of native bees, "which are without stings, and produce a great deal of delicious honey."—(*Martin.*) Of snakes there are several varieties, some of them poisonous. Musquitoes prevail in the uncleared districts, as they do in all warm uncultivated regions where there are marshes and trees to harbour them; but we do not see it anywhere mentioned that they form that horrid nuisance which they are in almost every part of North America. In some places, fleas are described as forming a serious nuisance. The rivers abound with fish, some with cod of a large size; and of aquatic birds the usual kinds are seen, including swans of a dark colour. Shrimps, mussels, and oysters, are plentiful; the oysters, though small, are of a very superior quality, and abound on some parts of the coast to an extent quite unprecedented in any other quarter of the globe. The seal and whale fishery on the coasts of Australia offer boundless scope for profitable adventure to those acquainted with this branch of industry, and who have capital to risk.

The mineral riches of Australia are also of great amount. "Coal and iron, the most valuable of minerals, are met with in inexhaustible abundance, the latter being not infrequently found in the state of native iron in large detached masses on the surface of the ground. Limestone is still more abundant, and in some parts of the territory, as in Argyle county, New South Wales, it passes into marble, of which beautiful specimens have already been cut and polished by a skilful artisan from London, now established in Sydney."—(*Lang.*) The colony also possesses clay fit for pottery. A manufactory of brown and glazed earthenware, of the best quality, has lately been commenced on a large scale at Irrawang, near the confluence of the rivers William and Hunter, by that enterprising and scientific settler Mr. King, the well-known discoverer of the superior quality of Sydney sand for the manufacture of glass.

Vast as are the latent resources of Australia with respect to its fruitage, mining, and fisheries, it is not to these departments of industry that the country at present looks for its advancement. Its grand resource consists in an "illimitable extent of pasture-land, which it presents to the sheep-farmer or the proprietor of cattle in every direction."—(*Lang.*) No country on the face of the earth seems to be so admirably adapted for the feeding of sheep and produce of fine wool. America, as is well known, is not a sheep-feeding or wool-growing country. In Canada and other northern parts, sheep require to be housed and fed by artificial means for several long winter months; while on the fine prairies of the States, the sheep which are left at large throughout the year do not yield wool of a valuable quality. Australia, on the other hand, resembles Spain in its qualities for pasturage in all seasons; and its climate produces equally fine, if not superior wool. At the present moment, Australian wool enjoys the highest reputation in England and America—it takes the lead in the market—and so readily and so profitably is it disposed of, that the cost of transport of sixteen thousand miles goes almost for nothing in the grower's calculation of profits. Most of those beautiful and soft woollen fabrics which go by the names of Indianas, Merinoes, and Challis, and are in so great request by ladies, in the shops of our haberdashers, are chiefly manufactured from this fine Australian wool; and it is obvious, from the growing taste and demand for these articles, which are so well suited to our climate, that (barring fiscal interference) the production and sale of this species of wool must soon become one of the first trades connected with British commerce.

The aborigines or natives of New South Wales are now very inconsiderable in numbers. They lead the usual wandering life of savages, roaming throughout the interior in small tribes, each claiming as head-quarters a respective territory. They are jet black in complexion, and in general tall and thin in their persons, with large heads, large lips, and wide mouths, and are altogether the reverse of beautiful, according to our ideas of that quality. They have been considered, although the opinion is not completely borne out by experience, as among the lowest of all known savages in the scale of intellect. There is certainly less mechanical genius among them—fewer contrivances to improve the original condition of man, than are to be found among the natives of any other quarter of the globe. Their only arms are a rude spear or rather pointed pole, which, however, they throw with great force and precision; and a short club, called by themselves a *waddie*. Their huts are of the poorest description, and they wear no sort of covering whatever on their bodies. All attempts to civilize them, and to induce them to abandon their wandering life, have hitherto been nearly ineffectual; and with the exception of a few in the neighbourhood of Sydney, and some other of the colonial towns, who . . . is contiguity has, in some degree, forced into a half-domesticated state, they still wander in roving tribes throughout the interior. From the latest accounts, it does not appear that the white settlers are now suffering much from these miserable beings; indeed, it seems that any person may command their good will by the slightest efforts of kindness and conciliation.

The climate of Australia, confining ourselves of course to the settled portion of the country, although varying considerably in different districts, is altogether highly agreeable and salubrious. According to Mr. Cunningham, who was a surgeon in the colony of New South Wales, exposure produces no bad effect, from the dryness of the atmosphere; and it has been recommended to consumptive patients. The summer commences in December and extends to February, during which period the heat is considerable. Dr. Lang states that the thermometer seldom rises above 75° in Sydney, except when the hot winds blow from the west. Another writer mentions having walked two miles to church, with the thermometer at 146° in the sun, and 95° in the shade, yet felt no inconvenience, the air being dry and pure. In the lower districts, the air is tempered by a cool and delightful sea-breeze, which blows steadily and regularly through the day, and is succeeded at night by an equally steady and grateful breeze from the land. The average temperature at Sydney during winter is 55°, and there is only one instance on record of snow having fallen in the town, which was on the 17th June, 1836. In the higher districts, of course, the cold is greater; the thermometer at Paramatta sometimes falling so low as 27°, and in the district of Bathurst snow lies for a short time in winter.

A peculiarity in the climate of Australia is the prevalence of hot winds during the summer. These blow from the north-west, and resemble a strong current of air from a heated furnace, raising the thermometer to 100° in the shade, and 125° when exposed to their influence. They seldom occur more than four or five times every summer, and last only a few days. It has been supposed that these winds derive their extreme heat from passing over a great extent of arid and heated country, which deprives them of all moisture. Breton, in his tour in New South Wales, says—"I rode fifty miles a day, in the hot wind, without feeling more inconvenience than in a hot day in England; and at night I have slept in the open air, my saddle for a pillow—the breeze balmy, the firmament studded with innumerable bright stars shining sweetly through the deep blue of that cloudless sky, and never yet experienced any ill effects from it; indeed, in a climate like that of New South Wales, I question if any thing is to be feared from night exposure."

Regarding the mortality in Australia, no certain tables have as yet been formed. Dr. Lang says—"I am inclined to believe that the probabilities of life for any

number of children born in the colony are higher than for a similar number born in England." Several instances of longevity are mentioned—one of a woman who had reached 125 years, and was able to perform her daily work. Mr. Butler says he has seen several persons upwards of a hundred years old, which is confirmed by Dr. Lang and others. At Moreton Bay, a penal settlement, only one man was in the hospital, out of 1200 convicts and soldiers, in six months. In Bathurst district, which is upwards of 2100 feet above the level of the sea, only two persons are said to have died in twelve years. All writers agree upon the salubrity of the climate, however much they may differ regarding the capabilities of the country.

Australia being situated in the southern hemisphere, the seasons are the reverse of those in Britain—January being the middle of summer, and July of winter. The spring months are September, October, and November; those of summer are December, January, and February; autumn includes March, April, and May; and the winter months are June, July, and August. March, April, and August, are generally considered the rainy months. The average temperature of spring is 65°; summer, 72°; autumn, 66°; and winter, 55°. As a matter of course, while it is day in Britain it is night in Australia, a circumstance of no consequence to the inhabitants.

Australia, though originally discovered by the Dutch, has long been considered as a possession of the British crown. In 1778, the British government planted a settlement at Botany Bay, in consequence of the recommendation of Captain Cook, designing it to serve chiefly as a place for the reception of transported convicts. This was soon after removed to Sydney, on Port Jackson, and, notwithstanding the unfavourable circumstances attending convict labour, was found to prosper very considerably. In 1803, a second settlement was formed on Van Diemen's Land, to which convicts were also sent. The transportation of convicts to these two colonies has been continued till a recent period, and has had of course a certain moral effect on the population. A large portion of the inhabitants are either convicts, or the descendants of convicts. The more recent settlements in Australia, namely, West Australia (1829), South Australia (1836), Port Philip, and Port Essington, have not received convicts. Hence the classification of the Australian colonies into penal and non-penal; a distinction, however, which we may hope to see always less and less marked, as time and the usual moral influences work their effect on the masses of settlers.

With these general remarks, we proceed to specific notices of the colonies, beginning with the oldest and most extensive,

NEW SOUTH WALES.

This colony includes a large portion of the east side of Australia, or from Cape York on the north to Bass's Straits on the south. Its general appearance from the sea is far from being inviting, presenting immediately on the coast a continuous front of bold cliffs and mural precipices, unbroken for many miles together; behind these, again, and running generally parallel with them, at an average distance of about forty miles, rises a chain of rocky, precipitous, and almost impassable mountains, extending along the whole eastern coast. These are called the Blue Mountains. The unpromising appearance of the shores of New South Wales is not removed upon landing. For five or six miles interiorly, the land continues barren and rocky, presenting few other signs of vegetation besides some thinly scattered, stunted shrubs and dwarf underwood. At this distance inward a marked change begins to take place; the soil improves, and begins now to be encumbered with tall and stately trees, which soon again thicken into a dense but magnificent forest, indicating, indeed, a more luxuriant soil than that passed, but scarcely less discouraging to the settler. Advancing inwards, however, from six to nine miles farther, another change takes place. You have cleared the forest, and the promised land lies before you, improving with every step you advance; now presenting an endless variety of hill and dale, covered with the most luxuriant vegetation; now extensive plains, resembling the finest parks in England—a resemblance which is made the more striking from their being similarly interspersed with magnificent trees, just numerous enough to add beauty to the land without encumbering it.

Such is, with few exceptions, the whole of the eastern coast of Australia. The colony is, or was lately, divided into the following counties:—Ayr, Argyle, Bathurst, Bligh, Brisbane, Camden, Cook, Cumberland, Cambridge, Durham, Georgiana, Gloster, Hunter, King, Liverpool, Macquarrie, Murray, Northumberland, Phillip, Roxburgh, St. Vincent, Wellington, Westmoreland, and Melbourne. To these, additions are constantly taking place, and we therefore do not pledge ourselves for the accuracy of the list.

Ayr.—This county is remarkable for the vast proportion of high, rocky, barren, and mountainous land which it presents; it is also, in general, so thickly timbered as to give the greater part of it the appearance of one immense forest. The quantity of land capable of cultivation in this district is, therefore, comparatively small; and though there are some good tracts occasionally to be met with, it is not, on the whole, by any means a desirable quarter of the colony to settle in. The climate, too, has been found to be highly unfavourable to wheat; and the hills are bleak, poor, and brushy, and not well adapted for grazing. Port Macquarrie, one of the penal settlements of the colony, is in this county.

Durham.—There is but a small portion of this county located, as it is called, that is, possessed by settlers; and its general appearance, so far as it has been explored, like the greater number of the other districts, is exceedingly varied, often presenting the most beautiful scenery, and equally often the reverse: on the whole, it does not seem to be by any means rich in suitable localities for the agricultural emigrant. Notwithstanding, however, this unfavourable character when generally spoken of, it contains some of the finest lands in New South Wales; these are to be found in the neighbourhood of the Hunter and Patterson rivers, on the south and south-east side of the county, as laid down in the maps. The fertile valleys and soft green undulating hills of this part of the country, are spoken of rapturously by all who have seen them; they are, however, of course, all already located, and not an acre worth taking can here be had except by purchase from the present proprietors. In this district is situated the large and commodious harbour of Port Stephen, and the township of Maitland, the capital of the district. Maitland is one of the most considerable towns in the colony, and now daily steam communication with Sydney. The next district, pursuing the line of coast, is

Northumberland—lying between Port Hunter and Broken Bay, a distance of about fifty-five miles, and extending inland about eighty miles. This county possesses the usual proportions of grazing land, and barren and fertile tracts. The best lands, though there are many other beautiful and desirable localities, are to be found in the neighbourhood of Patterson river, which divides it from the county of Durham. Within this county is situated the town of Newcastle, so called from the abundant supply of coal which it affords; the whole surrounding country, as well as a line of coast extending from sixty to seventy miles on either side of it, presenting evidence of its abounding with that valuable mineral. The coal is of a very good quality, though rather small, and makes a brisk fire. The Australian Agricul-

ture! company have a lease of the mines from government, and they supply coal at the pit for 8s. a ton to the dealers, who supply Sydney and other places at from 20s. to 30s. per ton, this great increase to the price being caused by the high rate of wages. The company have a powerful engine to work the coal and load vessels.

Cumberland.—Following out the line of coast, as originally proposed, we now come to the county of Cumberland, which has a coast line, stretching southward, of about fifty-six miles, namely, from Broken Bay to Coal Cliffs, about eighteen miles south of Port Hacking, and running inland about forty miles. This county, though one of the smallest, and in point of fertility of soil one of the worst in New South Wales, is nevertheless the most important of the whole, from its containing the principal towns in the colony, and among these Sydney, the capital. In this county, also, is situated the celebrated Botany Bay. The towns and ports in this district are Sydney, the capital, Paramatta, Windsor, Liverpool, Campbeltown, and Darling Harbour. By a reference to the map, it will be observed that the coast here is opened up by spacious inlets of the sea, all of which form excellent harbours; into the head of one of these harbours flows the Hawkesbury river, whose banks present a stretch of fine alluvial lands, to the extent of a few thousand acres.

Sydney is situated about seven miles inwards from the head of Port Jackson, which is considered to be one of the finest natural harbours in the world. It is built upon two necks of land, with an inlet between, called Sydney Cove, possessing a depth of water which enables vessels of the greatest burden to come close to the land. Half a century ago, the ground on which Sydney stands was a barren, desolate wild, covered with wood, and tenanted only by savages and the kangaroo. In the year 1800, its population, consisting of free settlers and convicts, amounted to about 4000, and now it is reckoned to be upwards of 30,000. Sydney is in general a handsomely built town, and here are to be found more than all the conveniences and luxuries of a British town of the same extent—regular and handsome markets, public seminaries, banks, flour-mills, warehouses, hotels, distilleries, breweries, steam-engines, stage-coaches for different parts of the colony, five newspapers—the Sydney Herald, the Sydney Monitor, the Sydney Gazette, the Australian, and the Colonist, besides the Government Gazette, equally respectably-looking periodicals with any published in this country. Being the seat of government, here centres the colonial business; and the shipping to and from England and other parts of the world is on an extensive scale.

The wharfs and warehouses in Sydney are of surprising extent, and the fine secure harbour in front, so advantageously adapted for general traffic, as well as the reception of vessels employed in the sperm-whale fishery of the southern ocean, is a grand feature in the scene. From all we can learn of Sydney, it appears that the industry and enterprise of its inhabitants, acting on the great resources around them for inland and external trade, promise to raise this chosen seat of population to a high pitch of prosperity; and we may expect that in a few years Sydney will be by far the most important British city in the colonies. The environs of the town are said to be very charming, and include a botanic garden, laid out with handsome walks and rides.

Next to Sydney in importance, though much inferior to it, is Paramatta, situated at the head of the narrow inlet of the sea in which Port Jackson terminates above Sydney. Between the latter place and the former, a distance of about sixteen miles, there is frequent and regular communication both by land and water, two coaches, one morning and evening, and two passage-boats, daily plying between the two places, the fare of the former 4s. inside, and 2s. outside. Nothing can exceed the beauty of the scenery which presents itself on all sides as you proceed to Paramatta by water; the sea generally smooth as glass, or but gently rippled by a slight breeze; innumerable little promontories covered with wood to the water's edge, stretching into the sea, and forming a corresponding number of beautiful little bays and inlets, in endless succession and variety. Paramatta contains upwards of 5000 inhabitants. The greater part of the houses here are built of brick or white freestone, and being for the most part unconnected with each other, cover a greater extent of ground altogether than its population would seem to warrant. The situation of Paramatta is exceedingly delightful. It lies in a spacious hollow, covered with the richest verdure, and surrounded by hills of a moderate height. Here too, are churches, hotels, taverns, seminaries, &c., and all the other appendages of a considerable country town, with a military and convict barracks, jail, government house, and the female factory, an establishment for the reception of incorrigible female convicts. Many of the private houses are of elegant construction, with parks and gardens attached; the place altogether thus forming rather an assemblage of cottages than a town: the streets, however, are regularly laid out, running north and south, east and west.

Pursuing an inland course for about twenty-one miles, the traveller next arrives at Windsor, containing a population of about 2000. From Paramatta to this little town a coach runs three times a week. Windsor, which, in the description of its buildings, much resembles Paramatta, is built upon a hill close by the River Hawkesbury, which forms the north and north-western boundary of the country, and which, after a circuitous route of about 140 miles, discharges itself into Broken Bay Windsor also contains a handsome government house, with extensive gardens, &c.; two churches, a jail, court-house, military and convict barracks, taverns, inns, shops, &c. The lands in the neighbourhood of Windsor are exceedingly fertile, but this advantage is more than counterbalanced by its extreme liability to inundation from the Hawkesbury (in consequence of its vicinity to the Blue Mountains), which has been known to rise to the almost incredible height of 93 feet above its ordinary level. Inundations of 70 and 80 feet are of frequent occurrence, and the consequence to settlers within its reach are often fatal, and always ruinous to their settlements. The town itself, which is built on an eminence of about 100 feet above the level of the river, has hitherto escaped these tremendous overflowings; but as its elevation above the highest known floods is only a few feet, it cannot be considered as free from danger. Next to Windsor in importance is Liverpool, at the distance of about eighteen or twenty miles from Sydney, in a south-west direction. Between these two places a stage-coach runs several times a week. Liverpool is situated on the banks of George's river, which discharges itself into Botany Bay. It possesses a church, two or three good inns, stores, court-house, jail, and the usual accompaniments of a town in New South Wales—a convict and military barracks. The soil around Liverpool is of a very indifferent quality; but as the town occupies a central situation between Sydney and some fertile districts in the counties south and west of it, it is, notwithstanding, a place of considerable bustle, and of rising importance. George's river, on which it is situated, and which is about half the size of the Hawkesbury, is navigable for boats of about twenty tons burden as high up as the town. Recurring again to the coast line, we come to the county of

Camden—extending south from Coal Cliffs to Shoa Haven, a distance of from thirty-five to forty miles, and stretching interiorly north about sixty miles, with an average breadth of about twenty miles. There are no

yet any towns in this county. It possesses, however, an average quantity of fertile land, but is greatly deficient in water; the very limited supply which it possesses chiefly proceeding from branches of the Cow Pasture and other rivers. This defect operates, as might be expected, greatly against the prosperity of the district, since, without that important element, its fertile plains can have no temptation for the settler. Nor is there merely a short supply for the irrigation of the soil; we are assured that water can scarcely be obtained even for the common purposes of life. Mr. P. Cunningham relates, that he "once travelled for twelve miles along one of the main roads (in this county) in the height of summer, yet could only obtain one drink of hot muddy water throughout all that distance." Camden, though not remarkable for its extent of cultivable land, possesses, perhaps, a larger proportion of pasture land than any in the colony, and this of acknowledged superior quality. The most flourishing local district in this county is the Illawarra, situated at the foot of a mountain of that name, a few miles inland from the seacoast, and one of the most beautiful and fertile localities in the whole colony. Continuing the coast line, we have

St. Vincent.—This county is of considerable length, and possesses several good harbours, particularly Shoal Haven, Jervis Bay, and Bateman Bay. It is well watered by a number of streams, one of which, called the Clyde, runs nearly parallel to the sea for a considerable distance. The lands generally in this county are described as large rich open plains, watered by copious, never-failing streams. There are many parts on the Shoal Haven river which are admirably adapted for agricultural operations, and the same may be said of those on the Clyde.

Argyle.—This county is about sixty miles in length, and of an average breadth of from twenty-five to thirty. About the one-half of it is indented, as it were, between the county of Camden on the coast, or eastern side, and the county of Westmoreland interiorly. It is one of the finest districts in New South Wales, producing wheat and other agricultural commodities of the first quality, and in the greatest abundance. Large tracts, too, of the best pasture-land are everywhere to be met with; and, from its geographical position, its climate is of the most delightful kind, highly favourable not only to the rearing of every description of cattle, but rendering it capable of producing, in great perfection, all the fruits and vegetables of Europe.

Westmoreland—stretching from north to south about eighty miles, and averaging in breadth about forty. This is the most mountainous district in the settled portion of New South Wales; and although none of these are of any great height (the highest not much exceeding 3000 feet), yet they are so numerous, extensive, and withal so barren, that but a very small portion of cultivable land is left. It is not, however, without some fertile spots, and some excellent grazing districts. Among the best of these is an extensive flat called Emu Plains; but the general character of the country is highly unfavourable to the agriculturist. There being little more deserving of particular notice in this county, we proceed to the adjoining county of

Georgiana—situated behind the Blue Mountains, and bounded on the north and east by the counties of Westmoreland and Roxburgh, and thence stretching south and west interiorly, but without any definite limits being yet assigned to it in that direction. This county presents an irregular and varied surface. It is, however, comparatively lightly timbered, and generally easily accessible; but, although particularly adapted for grazing, it presents only a small portion for the plough, and that consisting merely of occasional patches on the banks of rivers and streams. As a grazing district, however, it is not inferior to the best in the colony, and, in this point of view, is an exceedingly desirable place for the settler.

Roxburgh is separated from the sea by the counties of Northumberland and Durham, and lies beyond the Blue Mountains. It contains a large proportion of hilly and barren country, but possesses some tracts of good arable land, and is well adapted for grazing.

Bathurst.—This county at one time formed a portion of Roxburgh. It consists of extensive plains of remarkable beauty and fertility, and contains many thousand acres of the finest pasturage. These are now covered with the flocks and herds of settlers to an immense amount, this territory alone furnishing the greater proportion of the whole quantity of wool exported from the colony. It has also acquired great reputation for its dairy produce, and is considered, with regard to its cheese, as the Cheshire of New South Wales. Settlers here, however, labour under the same disadvantage with all those in the interior districts, namely, the being far distant from any market. This, however, materially affects the agriculturist only, and not the grazier, whose property can transfer itself. The rich territory of Bathurst Plains was discovered only a few years since, and was then considered, as it still is, a discovery of the highest importance to the colony. Nearly the whole of the available lands in the counties next the sea, occupying the space between the barren range of mountains and the coast, having been already located, or in the possession of settlers, there was none left for the thousands that were yearly arriving in the colony. On the discovery of these fertile plains, therefore, the superabundant emigrant population, which had been pent up, as it were, on the narrow strip between the mountains and the sea, left that territory, and, crossing the mountains with their flocks and herds, poured down upon this new land of promise, spreading themselves and their flocks far and wide over its rich pastures.

The climate at Bathurst, from its great height above the level of the sea (about 2000 feet), is considerably colder than in the eastern districts near the coast, and on this account, none of the tropical productions, which thrive so well in the latter, can be raised there to any perfection. In the midst of these fine lands is a thriving town of the same name, namely, Bathurst Town. Here there are several institutions, bespeaking the wealth and intelligence of the surrounding settlers. Among these are an academy, literary society, and public library. Proceeding still northwards, we arrive at the county of

Cambridge, which is separated from the sea by the county of Ayr. The land is in general good for grazing, but it is said sometimes to be inundated with water from the mountains. It formerly contained some valuable flat land, which now forms part of the county of

Liverpool.—This county contains a tract of valuable land called Liverpool Plains, lying behind a range of mountains which run east and west. Although of a very inferior description of land to Bathurst Plains, these are, notwithstanding, well adapted for grazing cattle and horses; but from their being subject to inundation in the rainy season, the best portion of them being under water during that period, they are neither adapted for agricultural purposes nor for the rearing of sheep. The Liverpool Plains extend about forty miles in every direction. There are few settlements in this county besides those on the plains just named, although it possesses some very eligible lands; but they are remote, and of limited extent.

COLONIAL GOVERNMENT—SOCIETY—TRADE, &c.

The government of New South Wales is conducted by a governor and a legislative and executive council; both of the two last, as well as the governor, are appointed by the ministry at home. The legislative coun

oil is composed principally of persons holding official situations, and these chiefly residing in the government towns. The executive council, again, is composed of persons filling the highest government appointments. There are, besides, a class of functionaries called police magistrates, distributed throughout the colony, and who take especial cognisance of offences committed by convicts, whom they have a power to punish by flogging or condemning to work in irons.

Sydney is the chief seat of the colonial government, comprehending the supreme court, and the heads of all the civil and military establishments of the country. Being a colony of Great Britain, the laws by which New South Wales is governed are the same in their leading features with those of England, differing only in instances where such difference was found necessary to adapt them to the peculiarities of the country. The colonies of South and Western Australia have governors appointed by the government at home. They have also councils much the same as New South Wales.

The external and domestic trade of Australia has scarcely yet emerged from a state of infancy; but it is fast gaining strength; and if no unforeseen circumstances should arise to check its prosperity, Australia will one day become, if it is not so even now, by far the most important of all the British settlements abroad. Its leading export articles are wool, and seal and whale oils; a great part of the latter is of that valuable kind called sperm-oil, produced by a description of whale found in the South Seas only, and which generally brings double the price of the common whale oil. In the article of oil, which has only very lately become an object of serious consideration to the colonists, the improvement has been remarkably rapid, there being now upwards of 40 vessels, averaging a tonnage of nearly 10,000, belonging to and sailing out of Port Jackson alone, exclusively engaged in the whale fishing. A striking evidence of the increasing prosperity of the colony, is the circumstance of its having, in four years, in some instances nearly, and in others more than doubled, the amount of its property in cattle and sheep, and the extent of its cultivated land.

The revenue of New South Wales had advanced in 1837 to £226,900, 3s. 10d., independently of the revenue from the sale of land, which was upwards of £127,000. The principal source of the colonial revenue is the duties exigible on liquors, and for licenses to dealers—a fact in itself distressing, for it argues a state of debasing intemperance. The land-revenue is a most important item; but from all we can learn, it has latterly been devoted to a liquidation of expenses incurred for jails and police, instead of paying for the import of free labourers. There is, therefore, on this point, great room for amendment; and such is the increasing attention paid to the subject by the colonists, that it may be expected to be arranged on a satisfactory footing.

We need not particularize the great and miscellaneous import and export trade of the colony, but confine ourselves to a few leading facts as an evidence of general prosperity. The imports, which amounted to £280,000 in 1826, had increased to £1,251,969 in 1839; while the exports from the colony, including the produce of the fisheries, had increased from £106,600 in the former year, to £948,776 in the latter. In 1824, the exports of wool amounted to 275,560 lbs.; in 1837, they were 4,606,915 lbs. In the Savings' Bank of New South Wales, the deposits increased from £24,469 in December, 1835, to £127,000 in August, 1840. The interest paid for deposited money in the ordinary colonial banks is, we believe, at the rate of from 6 to 8 per cent.; and at these banks bills on London will be discounted on favourable terms to emigrants bringing money in this form. Parties emigrating should exchange their cash for bills at respectable and old-established banks before leaving home, this being in every respect the safest mode of transfer. The currency of all the colonies is reckoned in pounds, shillings, and pence, as in England.

A large and profitable trade cannot fail to be ultimately established in wine, from vines which have been introduced as exotics. Some vines of a fine quality, presented by Louis Philippe, King of the French, to the late King William IV., have been sent to New South Wales, whose clarets may by and by rival those of France. Already, from grapes grown in the vineyards of the colony, excellent wine might be produced, if any thing like good management were exercised. From the peaches of New South Wales the finest brandy is distilled: so superior is this article, that, if it were allowed to be imported into Great Britain, it would speedily supersede the use of the brandies of France and other high-priced spirits. Silk (from the abundance of the mulberry) and dried fruits, with other useful and valuable articles, as opium and indigo, for the growth of which the climate is favourable, will doubtless by degrees be produced. At a short distance from Sydney, a large orange grove has been formed, from which upwards of 100,000 dozens of oranges have been sent into the market there in a year; and an immense quantity of fine grapes are sent by a steamer from Hunter's river every day in the season, to the Sydney market. The only articles of food in general use not produced in the colony, are tea and sugar; but these are largely imported, and sold at perhaps not the third of their price in this country. In the advertisements in the Sydney newspapers, we see the same kinds of articles announced for sale by tradesmen as are seen everywhere in the wealthiest establishments in Britain.

The production of wool has for some time back been a primary consideration with the settlers, and they have of late begun to pay more attention to the quality than they did formerly, quantity alone having been at one time all they aimed at. From the improvement which has taken place in the breed of sheep, as well as in the mode of preparing the wool for the market, Australian wool has now become an object of much interest to the dealers and woollen manufacturers in England, where it is greatly prized for the peculiar softness of the cloth produced from it, and which, if combined with a little higher degree of fineness—a result that must soon follow the care and attention that is now bestowed on it—would place it on a level with the best growths of other countries, and consequently direct an inexhaustible stream of wealth into the colony; and there are two important considerations at this moment operating to produce this effect. The first of these is the readiness of the market, and the fair remunerating price which the settler obtains for his wool; the next, the necessity which the distance of the extensive interior settlements from towns imposes on their occupants, of directing their whole attention to the rearing of cattle and sheep in preference to agricultural productions.

The state of society in New South Wales has been to a considerable extent affected by the transportation thither of convicts from the United Kingdom, and on that account is less agreeable than that of colonies free from this moral stain. The plan which has been usually followed by government on transmitting convicts need not be particularly described, as no new assignment is to take place. Convicts now deported are, we believe, sent to Norfolk Island, which may be called a penitentiary on a great and improved scale.

The most unhappy circumstance connected with the state of general society is, that the emancipated convicts and their descendants, however well behaved, are held as a degraded or inferior class by the free settlers; and thus two factions have sprung up in the colony, who virulently persecute each other, and cause dispeace in what would be otherwise an agreeable condition of affairs. As the settlement of convicts as labourers

abandoned as a practice unworthy of an enlightened government, it is to be hoped that the line of distinction between the two classes of inhabitants will gradually disappear. In Sydney, where society both bad and good equally flourishes, there are many hundreds of families of the highest respectability, enjoying all the elegancies of refined life, exchanging its courtesies, and cultivating its amusements and pleasures; splendid equipages are to be seen rolling along its streets; its public dancing and assembly rooms blazing with light, and filled, as our newspapers would say, with "beauty and fashion;" music parties and theatricals filling up the measure of the happiness of a Sydney life. Next to Sydney, Bathurst has probably the highest pretensions to a superiority in the general character of its society. Besides its literary institutions, it boasts an association called the Bathurst Hunt, composed of all the sporting gentlemen who reside in the district; these wear a uniform, and are, as a body, no way inferior to any similar society in England.

The convict system only extended to New South Wales and Van Diemen's Land, the other colonies being entirely free from convicts, except such as have obtained their freedom, and are of course allowed to emigrate whither they please. The colonies of Port Philip, South Australia, and Western Australia, are altogether peopled by free emigrants, who seem by the latest accounts to be taking active steps to establish societies for advancing knowledge. A mechanics' institute has been established at Melbourne, and agricultural and horticultural societies at Adelaide. In New South Wales there are six infant schools and thirty-three parochial schools; and also two government schools, one at Sydney and the other at Paramatta. An orphan hospital has been established at Sydney, capable of rearing and educating 125 children. The male children of this institution are apprenticed out as they come of age, and the females receive a small sum when married. The Australian College was established in 1831, and is now in a flourishing condition. By means of a large and regular import of English literature, the tone of feeling and general intellect of the colony cannot fail to advance in a yearly increasing ratio.

With respect to the means adopted for sustaining religious and moral culture, we may mention that there is no lack of churches and chapels where they are required. On this subject, Dr. Lang remarks:—"The colonial churches are, the Church of England, the Church of Scotland, and the Church of Rome. Besides these establishments, there are several congregations of dissenters. Whenever a hundred adults shall attach themselves to the ministrations of any pastor, duly recognised and sent forth by one or other of the colonial churches, and shall contribute a comparatively small amount for the erection of a church and manse, the government guarantee a salary of £100 per annum for such pastor, and advance at least £300 from the public treasury to assist in erecting his church and manse; and, to stimulate the exertions of the pastor, his government salary is to be augmented to £150 or even to £200 per annum, as soon as he rallies around him a congregation of two or five hundred adults.

"The practical operation of the new ecclesiastical system to which the colonists of New South Wales and Van Diemen's Land are now subjected, I am happy to state, promises to be attended with the happiest results. It has already infused something like life and vigour into the withered and shrivelled arm of colonial Episcopacy; it has proved as life from the dead to the Presbyterian communion. By the Episcopalian laity of all classes, it has not only been acquiesced in as a measure of urgent necessity, on the score of justice to others, but received as a measure of real benefit to themselves. Local committees for the raising of the funds requisite for the erection and endowment of additional churches of that communion, in all parts of the colony, were formed immediately after the announcement of the new system." In parts which have been settled by emigrants from the Highlands of Scotland, there are preachers who use the Gaelic tongue.

PORT PHILIP DISTRICT.

The southern portion of New South Wales, opposite to Van Diemen's Land, obtained this name from an inlet called Port Philip, which, within a few years past, has become the seat of a flourishing settlement. The same district was named Australia Felix, by its first explorer, Major Mitchell, from a consideration of its uncommon natural beauties and advantages. Hitherto, the settlement has been a dependency of New South Wales; but it is now contemplated to erect it into a distinct crown colony, with a governor in direct communication with the home country. Port Philip was known in the early days of the New South Wales colony, and was named after the first Australian governor, Philips. A settlement was attempted in it by Governor King, but it failed from want of sufficient means and of a knowledge of the country, as well as from the accident of its being pitched upon the sandy barren side, where no good water was found. The failure led to the settlement on the Derwent river in Van Diemen's Land, and it is rather singular that the first settlers in the renewed effort were from that island: these settlers, having crossed the sea (Bass's Straits) to pasture their flocks on the Australian continent, brought the capacities of Port Philip into notice, and led to those investigations which have terminated in making it a flourishing colony. Major Mitchell describes the interior "as of vast resources, of the most various and fascinating description, more extensive than Great Britain, equally rich in point of soil, and ready for the plough." The land is well clothed with grass, and requires no clearing, the trees being few. The prevailing plants are forest oaks, honeysuckles, and what are called wattles, which belong to the mimosa tribe. The face of the country is diversified by gentle slopes, plains, and vales, of great fertility, and well watered by numerous springs. There are few hills; but these are beautifully wooded, and with little labour might be rendered excellent grazing lands. From the private information we have received, it appears that a very large portion of the interior consists of the usual flat and extensive plains in which Australia abounds. These plains are more or less covered with herbage suitable for sheep pasture, and are here and there refreshed with the shade of trees and water-courses.

The capital of Port Philip district is Melbourne, a rising town situated at the falls of the River Yarra-Yarra, a few miles from the harbour. From its situation, the town can always be supplied with fresh water from above the falls, while immediately below, ships of 200 tons can be discharged. Port Philip itself is a large bay, about forty miles long and thirty-five broad, with an entrance from Bass's Straits, of three-quarters of a mile in breadth. It is of such a depth, that a vessel of any tonnage may enter and find shelter behind the various creeks with which it abounds. Being situated opposite Launceston in Van Diemen's Land, a ready intercourse may be carried on betwixt the two ports. The country around Melbourne is thickly studded with trees, chiefly what the natives call the *yarra*, and from which the river has received its name.

The following is an extract of a published letter from a gentleman residing at Sydney, referring to this rising settlement:—"I am quite delighted with this beautiful Melbourne. Enthusiastic as I was regarding the extraordinary advantages of this favoured province, I almost upon my approaching it had some misgivings that the reality would, as, alas! is too frequently the case, involve the bitterness of disappointment. The reality, however, in this instance, far surpassed my most sanguine expectations,

an I every day's experience confirms me in my favourable opinion of this Australia Felix. The appearance of Melbourne is positively wonderful; a foreigner unacquainted with the enterprising, determined, bstacle-surmounting character of our countrymen, could never believe that it was the creation of eighteen months' industry. The wand of the magician could not have effected a change more wondrous. If all the towns on the road from Sydney to Yass were put together—Liverpool, Campbelltown, Goulburn, and Yass, they would not make so respectable a town as Melbourne now is The commercial importance of Melbourne is evident from the activity of its inhabitants, and the number of ships and vessels that visit its port (*i. e.* Port Philip). A powerful steam-ship, to trade between this and the neighbouring settlements, is pressingly required, and would pay her owners a very handsome profit. I have just returned from a delightful boat excursion on the beautiful Yarra-Yarra, the scenery on the banks of which is most attractive. * * * You are at liberty to make any use you please of these remarks; their correctness may be depended on. We feel perfectly convinced, that the country around or connected with Port Philip, is a finer tract than any of a similar extent in Australia, and better situated, in point of locality. It is destined to become one of the most flourishing provinces of this continent."

Mr. Russell, in his tour in the Australian colonies, says of Port Philip—"This is a portion of the Australian territory which has in less than two years gathered a community of about 3500 souls, who have been attracted to the place by its good harbour and superiority of soil. Being more to the south than either Sydney, Adelaide, or Swan river, its geographical position gives it every advantage both in climate and productions. Private enterprise has already raised it to an important colony, through the shipments of its wool to the mother country, besides the flocks of superior sheep sent to South Australia, &c., and even mutton to Van Diemen's Land, thereby returning to that fertile island their own sheep, after being fattened on the soil of Australia Felix." From tables in Mr. Russell's work, it appears that, in 1837, 56,326 acres of land were sold in this district, for which the sum of £69,099 was obtained, and that chiefly from individuals well acquainted with the capabilities of an Australian soil. The first settlers came from Van Diemen's Land and New South Wales to Port Philip, preferring it to the older settlements; and these being in almost all cases young men, a spirit of enterprise was at once set agoing, which has been since of the greatest benefit to the colony.

Besides Port Philip, Australia Felix also possesses an excellent station for a town, in Portland Bay. This bay is rather exposed to a heavy swell during four months of the year, which renders landing in it dangerous; but during the remaining eight months the winds blow off the land, when it is perfectly safe. The interior, for seventy miles back, according to Mr. James and others, exhibits one of the richest and most desirable countries in the world, fit either for grazing or for the plough. Mr. James thus speaks of Portland Bay:—"To the north-east of Portland Bay are fine sheep and cattle runs, until you come to the lakes; and here may be seen large flocks of Van Diemen's Land sheep depasturing all the way up to Mount Macedon and down to Geelong. The country about Cape Otway is rocky and mountainous. This cape is opposite Bass's Straits, which are only forty miles broad at this part; and at the back of the highlands of the cape the grass is good, though the fresh water is not so abundant as in the rear of Portland Bay." This district is about 700 miles overland from Sydney, and the road is good and well marked.

SOUTH AUSTRALIA.

South Australia is a large district of country, lying on southern shore of the Australian continent, between the Swan River settlement on Western Australia on the west, and New South Wales on the east. It is contained within the 26th and 36th degrees of south latitude, and forms a territory of nearly 300,000 square miles, or 192,000,000 acres, being nearly double the dimensions of the British Isles. It is penetrated from the sea by Spencer's Gulf and Gulf St. Vincent, at the entrance of which lies Kangaroo Island. The country from the eastern side of Gulf St. Vincent is very picturesque; being in general well wooded, with considerable spaces of open country. This renders it admirably adapted for sheep farming, and in many places the land is ready for the plough.

About ten or twelve miles inland runs a range of hills, most of which are good soil to the top, and afford abundance of food for cattle. The highest of these is Mount Lofty, which is 2400 feet above the level of the sea. The country between these hills and the sea is diversified, being in some parts undulating and in others level.

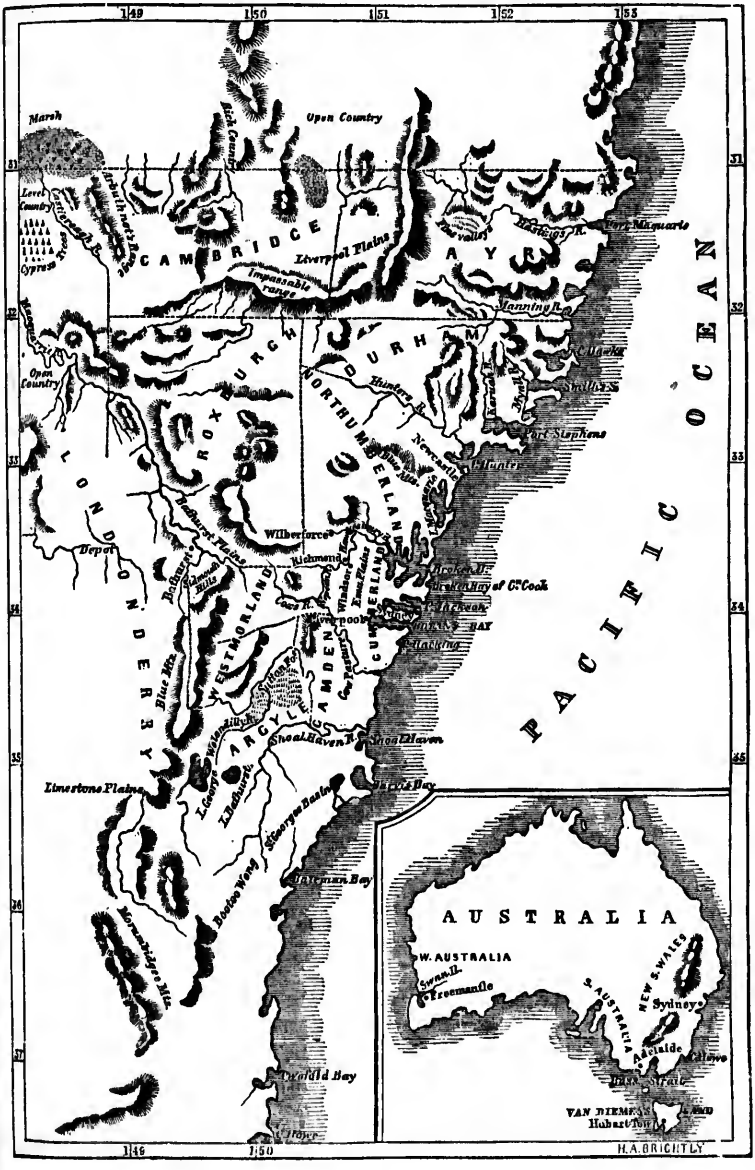
Gulf St. Vincent is described as without an island, rock, reef, or sand-bank, and almost any part of it is perfectly safe anchorage all the year round. Spencer's Gulf runs nearly 300 miles into the interior, becoming quite narrow and shallow at the top. It abounds with flat fish; but the country around is deficient in fresh water, and but a small portion of the soil is capable of cultivation. The great want of this colony is rivers, by which an intercourse with the interior could be effected. The largest river is the Murray, which is described by Mr. James as being, for the last 200 miles of its course, nearly as broad as the Thames at London Bridge. On the banks of this river are several fine alluvial flats, at present covered with reeds, but which are capable of being made to yield abundant crops of grain. These flats are nearly on a level with the river, and could be irrigated at any season. The Murray delivers its waters into Lake Alexandrina, which also receives the waters of the Hindmarsh, and from thence to the sea the river is broad and deep. The next river is the Torrens, on the banks of which stands the town of Adelaide, the capital of the colony. The site of the town is well chosen as to the healthiness of the situation, but labours under the disadvantage of being six miles from the harbour, betwixt which and the town the carriage of goods is very expensive. The harbour is perfectly safe for shipping, but there is a bar at the entrance which prevents very large ships from entering. The great objection to the site of the town is the want of good water, which can only be obtained by boring to the depth of about forty feet, or taking it from the Torrens, which degenerates into almost stagnant pools in the dry season. The town of Adelaide has several good stone and brick houses, and the churches and public offices are described as handsome buildings. The River Glenelg, at the eastern boundary of the colony, is of considerable size during the winter months, but is almost dry in summer. Lake Victoria is a sheet of water about twenty miles long and seven broad, communicating with the Murray river by a stream called the Rufus. Its banks abound with good pasturage, and the country around being flat, it might be made an admirable agricultural station. Lake Bonney is smaller than Lake Victoria, but the land around it possesses equal advantages with regard to soil.

Much has been written upon the soil of South Australia. On the one hand, it has been lauded as the finest spot in the world, and on the other decried as not worth the trouble of cultivation. From the best authorities we have been able to consult, there appears to be very little of what can be called really barren land. The principal part of it is fit for grazing sheep and cattle, and there are many parts which would yield an abundant return of grain if subjected to the plough. On this subject Mr. James, who is known not to be very favourable to the colony, says, "In short, there is more good soil than will be required for many years to come; it is generally cov-

posed of a rich loam, averaging about nine inches thick, on a substratum of coarse calcareous rock, and, through the whole extent of the plains round the settlement, gives evidence of having been at no very remote period covered by the sea, every stone you pick up being a part of the rock, and exhibiting a congeries of little shells. Over the hills the soil and vegetation are still finer; and the author visited a tract of country between the mountains and the mouth of the Murray, that seemed to contain nearly 100,000 acres of excellent rich soil, in many places ready for the plough."

From the want of mountains, the country is very free from rains, and even the rivers become comparatively dry during the summer. These deficiencies are in fact the grand drawbacks upon this otherwise fine colony. With respect to the condition of the colony up to a late period, we present the following extract from a speech of the governor (Gawler) to his legislative council, April 3

MAP OF NEW SOUTH WALES.



1840:—"The establishment of the colony has cost a large sum; but it is probable that no British province has ever attained to the same condition, at, to say the least, a smaller price. However great the expenditure may be, the results are great also.

"Three years and a half ago, the spot on which we are now standing was a desert unknown to Europeans. Now we are surrounded by a populous, and, to a considerable extent, handsome city. Our principal streets are lined with well-filled warehouses and shops, and crowded by all the attendants of active traffic; handsome and substantial buildings are to be seen on every side, and are rapidly increasing. Our port, which, a few years since, was an unknown salt-water creek, covered only by water-fowl, and enclosed in a mangrove swamp, is now filled with large shipping, from Europe, India, and the neighbouring colonies. The swamp is traversed by a substantial road, and handsome wharfs and warehouses are rising on its borders. A steam-tug is promised by the commissioners, and with such conveniences there will not be a finer harbour for vessels drawing under sixteen feet water. Ships of larger dimensions may discharge their cargoes from the gulf, which is in itself a secure roadstead. The neighbourhood of the capital is studded with numerous and populous suburbs and villages; while the more distant country, whether to the north, the east, or the south, is rapidly assuming, in population, that healthy and natural proportion which it ought to bear to the metropolis.

"Farming establishments are in active formation on every side; and it is now a matter not merely of hope but of sober expectation, that our magnificent agricultural valleys will soon be filled with produce sufficient for home-consumption. Flocks and herds of cattle from New South Wales, following each other in countless succession, already cover a tract of two hundred miles in length; and their enterprising proprietors are even now seriously contemplating [illegible] attempt at geographical discovery, which bids fair to make this province the great entrepôt of South Australia. Our institutions are assuming a condition of stability. Our public departments have attained to a high degree of system and order. The aborigines have been kept under humane control; and considerable, though I regret to say, as yet unsatisfactory, efforts have been made towards their civilization. Property and private rights enjoy as much protection as in any country in the world; and peace, union, and good understanding, reign throughout the community.

"Land has been surveyed, to an extent capable of containing three times the present amount of population; and the most promising arrangements are in active operation, for completing, in a comparatively short space of time, the survey of those rich and beautiful districts already discovered, which would enable us to increase it from ten to twenty fold."

We add the following from articles in the South Australian Register, July, 1840:—"In the last general notice of the progress of South Australia, published in August, 1839, the population of the colony was stated at 8500. This amount, we have since ascertained, was almost exactly correct. The arrivals since that period have increased the number to nearly 13,250, of which about 6700 are located in Adelaide and the villages in its immediate environs, and the remainder distributed throughout the agricultural and pastoral districts. On the 30th June, 1839, the stock in the province was as follows:—Sheep, 58,500; bullocks, cows, &c., 6250; horses, 520; pigs, 1000; goats, 130. On the 30th June, 1840, the colony possessed 186,000 sheep; 14,800 head of cows, &c.; 1250 horses; 3600 pigs; and 350 goats—showing, at the close of one year, an *increase*, after satisfying the large consumption of the population, of 27,000 sheep 8550 cows, heifers, and bullocks, 730 horses, 2660 pigs, and 170 goats. In the above number of sheep we have included 13,000 which have arrived overland from New South Wales during the present week. From advices just received, we learn that upwards of 40,000 sheep, 8000 head of cattle, and 500 horses, are now on their route overland, and may be expected within the ensuing three months.

"The prices at the present moment may be quoted as under:—

Sheep,	£1, 6s. to £2, 2s.
Cows and heifers,	9, 0s. to 18 0s.
Bullocks and steers,	10, 0s. to 21, 0s.
Horses,	35, 0s. to 120, 0s
Pigs,	1, 5s. to 7, 7s
Goats,	2, 0s. to 8, 8s.

"One of the most frequent, and, at the same time, most unjust and inconsiderate subjects of reproach, is, that we 'grow nothing'—that we 'produce nothing' Now, whatever may be the faults or errors of the colonists, we must deny, in the most unequivocal manner, that there is any thing of the *festina lente* in their character or proceedings. The first handful of settlers, in 1837 and 1838, could not fairly be expected to grow an ample supply of grain for themselves and for the thousands of emigrants that were pouring in upon them. During the two first seasons of the settlement of South Australia, it must not be forgotten, they *had no land surveyed and appropriated, whereon they could proceed with their farming operations.* In point of fact, last year was the first in which it was practicable to commence grain-growing. Nearly 500 acres were then fenced in and cultivated. At the present time, according to the most careful estimate we have been able to make, the number of acres, in wheat alone, exceeds 1600; and before the middle of November, we expect that there will be, in maize and other crops, throughout the province, considerably upwards of 2000 acres. Judging from the activity with which fencing is proceeding in all directions, we may safely state the amount of land which will be cultivated in 1841, at 12,000 acres. It is thus most gratifying to prove, that so far from our colonists being obnoxious to the charge of 'doing nothing,' they have been most actively engaged in turning the unlimited agricultural capabilities of the colony to good account. We are fully warranted in asserting, that the harvest of 1842 will see South Australia entirely independent of our neighbours for supplies of grain. A few years more, and the probability is we shall be able to supply them."

From a statistical return, June, 1840, we copy the following particulars:—

"*Stock.*—Sheep, 160,000; cattle, 15,000; horses, 1500; pigs, 3600; goats, 400.

"*Shipping.*—Ships arrived in the port, 104; tonnage, 19,399; ships from Europe, 18; ships in harbour, 12; tonnage, 3059.

"*Rural lands—number of acres selected.*—District A, 43,086; district B, 21,058; district C, 16,000; district D, 1040; district E, 7536; district F, 480. Total number of acres surveyed, 359,975. Special surveys of 4000 acres each, 36.

"*Houses in Adelaide.*—Brick or stone, 816; wooden, 1588; churches and meeting-houses, 8.

"*Wages.*—Carpenters, 12s. to 15s.; masons and bricklayers, 12s. to 14s.; labourers, 6s. to 7s. per diem. Men-servants, £25 to £60; women-servants, £12 to £25 per annum.

"*Price of stock.*—Sheep, 25s. to 40s.; cows, £12 to £18; oxen, £12 to £20; horses, £30 to £150; pigs, £2 to £6; goats, £3 to £6.

"*Imports.*—[These we omit, as they are such as might be expected.]

"On comparing this return with the one compiled to the end of 1839, it appears that the increase, during the

first six months of the past year, was as follows:—Population, 2000. Sheep, 93,604; cattle, 7000; horses, 800; pigs, 600; goats, 100. Number of acres selected in district A, 786; district B, 1920; district C, 5760; district D, 1040; district E, 1626; district F, 160. Total number of acres surveyed during this period, 199,739. Houses built, brick and stone, 403; wooden, 648. While sheep have fallen about 20s. and cattle above £4 each, wages remain the same."

WESTERN AUSTRALIA.

This colony, which is entirely distinct from New South Wales, includes the settlements at Swan river and King George's Sound. Swan river settlement takes its name, as is obvious, from the river in whose vicinity it is. This river is situated on the south-west coast of Australia, a little way north of the most extreme southern point, on the west side of the island. Its neighbourhood was first proposed as a place of settlement in the year 1828, when Captain Stirling was appointed lieutenant-governor. The latest accounts of the progress of this little colony are upon the whole favourable, although they do not certainly hold out any very great inducements for any one to go thither.

The soil appears, and really is, until you have gone about fifteen or twenty miles inland, extremely poor and barren. At this distance from the coast, however, it greatly improves, exhibiting many beautiful and fertile tracts, and bearing some of the most magnificent trees in the world. Here, also, is the same profusion of those gorgeous flowers which form so remarkable a feature of the natural vegetable productions of New South Wales and Van Diemen's Land. Its animal productions are entirely similar to those of the two former colonies, and it is equally free from any that are dangerous to man. The heat, however, would appear to be more oppressive than in either of the places just named. Whether this arises from a greater intensity in the sun's rays, or from a lighter or more irregular visitation of those cooling breezes which prevail in both New South Wales and Van Diemen's Land, is not explained; but the complaints by the settlers here of the warmth of the climate are frequent, while there are none in this particular from either of the former. The climate, however, is exceedingly salubrious. Not only have no complaints of any kind whatever, attributable to the country, appeared among the colonists, but they are enabled to bear exposures with impunity, which, in most other climates, might be attended with the most serious consequences.

The best land, indeed the only land, yet discovered sufficiently near the settlement worth cultivating, is on the banks of the Swan river, and on those of an adjoining river called the Canning; but even there it rarely extends on either side more than two miles from the stream, and not often so far, and all this land has been already located. There is, however, reason to believe that good tracts of country are to be found in the interior; indeed some have been found: but the young colony has not yet had time to devote to expeditions of discovery, or been able to avail itself of those that have been made. The pressure of emigration, however, and more leisure on the part of those already there, will no doubt very soon extend the dependencies of the settlement, and lead to some valuable acquisitions of country. The land already under cultivation has been found to be very productive, bearing crops of wheat and other grain equal to the best of any other country, but not yet in sufficient abundance to supply the wants of the colony. For grain, and many other articles of agricultural produce, it is still indebted to New South Wales, Van Diemen's Land, and the Cape of Good Hope; but the progress which it has made, and continues to make, bids fair to leave it at no distant date wholly independent of foreign aid.

There are already several thriving little towns in the colony, amongst these Freemantle and Perth; the former the port, being built at the mouth of the Swan river, and the latter the capital. The site of Perth is represented as happily chosen. It is situated on a picturesque spot on the north bank of the river, about twelve or fifteen miles above Freemantle. A government house is about to be built here, and there are many others, substantially built of both brick and stone, fast rising on all sides. Colonel Hanson, who has lately published an interesting account of the Swan river settlement, speaking of this infant capital, says—"The society of the place is hospitality personified; for though their means are somewhat limited, yet they share them with the kindest good will." The intending emigrant to that quarter, therefore, may look forward to at least a kind reception from his countrymen who are already there; and this is no small matter to a man who has just arrived a stranger in a foreign land, in which he is in all probability to spend the remainder of his life, and where he is just about to engage in an arduous struggle for the support of himself and his family.

KING GEORGE'S SOUND SETTLEMENT.

There is little in this settlement that can be considered peculiar to itself, as all its natural properties and characteristics are the same with those of Swan river. It adjoins to and is a dependency of the latter, and is situated on the south side of that point or projection of land which places Swan river on the west coast of New Holland. Farmers, labourers, mechanics, and whale fishermen, are greatly wanted here, and are offered the following encouragement, by authority of Governor Sterling, to emigrate thither:—A guarantee will be given, if desired, to such as wish to secure employment before leaving home, of certain wages proportioned to their abilities and industry, and regulated by their different trades; these wages assured to be about one-half more than what is given in this country. They will be also ensured of a supply of provisions at a rate not exceeding a fourth more than the prices of this country. To those who prefer devoting themselves to agricultural pursuits, a grant of land, at the rate of one hundred acres to each family, will be made, free of all charge, with the advantage of fixing the prices of stock, provisions, &c., before starting; thus enabling the emigrant to form a correct idea of the amount of capital which he would require before leaving his native land—a piece of information which is often much too long of coming, sometimes not until it is too late. It is recommended that all who go thither should be married persons, and that they should be accompanied by their wives.

SALE OF LANDS.

With respect to the sale of lands in these colonies, we cannot do better than give the official answer to a letter which we sent to the Colonial Office for information:—

"Colonial Land and Emigration Office,
9, Park street, Westminster,
1st December, 1840.

"Gentlemen—I am directed by the Commissioners of Land and Emigration to acknowledge the receipt of your letter of the 12th instant, referred to them by direction of Lord John Russell: and, in compliance with your request, that you may be furnished with the latest government regulations for the sale of crown lands in the colonies, mode of sale, and other particulars, I am desired to transmit to you the under-mentioned papers, which have been printed under the authority of the commissioners. [Here certain papers are mentioned.]

"It will be seen by the papers referred to, that in the Port Philip district of New South Wales, and in Western Australia, the public lands will be sold at one

fixed price, which is for the present established at £1 per acre.

"In Lower Canada, the public lands are also henceforward to be sold at a fixed price. In the county of Ottawa, and the county on the south bank of the St. Lawrence as far as the Kennebo road, the price is for the present fixed at 6s. per acre, and for the remainder of the province at 4s.

"In the following colonies, sales are made at auction, and take place at stated periods, the land being offered at the respective upset prices named in the under-mentioned list:—

Sydney district of New South Wales, comprising at present all parts exclusive of the Port Philip district,	12s. 0d. per acre.
Van Diemen's Land,	12s. 0d. ...
Ceylon,	5s. 0d. ...
New Brunswick,	2s. 6d. ...

"In Nova Scotia, the upset price is at the discretion of the governor in council; but by a local act, it is in no case to be less than 1s. per acre.

"In Upper Canada lands continue to be sold by public auction, at an upset price to be fixed from time to time by the lieutenant-governor in council. This price varies according to the locality, but the average price of land in 1836, 1837, and 1838, was 6s. per acre.

"In the Port Philip district, and in Western Australia, it is intended, as you will perceive by the enclosed printed papers, to divide the land into lots of 320 acres, or half a square mile. In Canada the lot has generally been 200 acres; in Ceylon, 100 acres. In Van Diemen's Land, and the Sydney district of New South Wales, the size of the lot is one square mile, except under special circumstances.

"The several prices above mentioned will, of course, be subject at any time to revision by the proper authorities. For additional particulars, I am directed to refer you to the parliamentary paper ordered to be printed by the House of Commons, on the motion of Mr. O'Brien, on the 18th of July last. I have the honour to be, gentlemen, your obedient servant,

S. WALCOTT, Secretary."

Here follow two of the chief papers referred to:—

"*Notice to Persons desirous of purchasing Land at Sydney or Port Philip.*

"1. With a view to promoting settlement in the Australian colonies, the following measures have been adopted, under the sanction of her majesty's government:—

"2. It has been determined that, for all purposes connected with the disposal of land, that portion of the territory of New South Wales which lies to the south of the counties of Murray and St. Vincent, and of the Rivers Murrumbidgee and Murray, as far as the eastern boundary of South Australia, shall be separated from the rest of New South Wales, and be distinguished by the title of the Southern or Port Philip district.

"3. Within the Port Philip district, land will henceforth be sold at the fixed uniform price of £1 per acre, in sections of one-half of a square mile, or 320 acres each.

"4. Towns already laid out, and in which any land has actually been sold, will be exempt from the operation of the foregoing rule, and town lots in them continue to be sold by auction; and the government will also have the power, should it be deemed expedient, to reserve any sites of towns likely to become the seats of local administration, or any sites eminently adapted for commercial sea-ports. The formation of all other towns and villages, including therefore every inland town, except where the residence of a government may be established, will be left to the enterprise and judgment of individuals.

"5. Certain lands, to be properly marked out in maps exhibited at the land-office in the colony, will be set apart for roads and other public purposes, and will be regarded as inalienable public property. But it is not intended, unless in very special and rare cases, to make any reservation of minerals, and all deeds of grant, therefore, will convey to the purchaser every thing above and every thing below the surface.

"6. Purchasers in the colony must buy their land at the office for crown lands in the district of Port Philip.

"7. Purchasers in England will have to deposit their purchase-money with Mr. Barnard, the crown agent for the colony, No. 2, Parliament street, from whom they will obtain a receipt, on production of which at the office of the Colonial Land and Emigration Commissioners, No. 9, Park street, Westminster, they will be furnished with an order, stating the number of acres which they have purchased, and directing that this quantity shall be granted to them upon their naming in the colony the spot of unappropriated land which they shall select.

"8. The charts and registers to be kept in the land-office at Melbourne are intended to furnish full and authentic information of all appropriations of land, and of all surveyed lands not appropriated, and of all portions of land reserved for public purposes. And each purchaser will be allowed to select his land in the order of his application at that office.

"9. Any one who shall pay in this country, or in the colony, the price for eight square miles, or £5120, will not be confined to districts already surveyed and open for sale, but will have the privilege of demanding a special survey of the land he is desirous to acquire. This land, however, must be taken in one block, of which only the outer boundaries, therefore, will be surveyed. It will also be subject to all regulations which may be established in the colony, respecting the proportion of front to depth, water-frontage, reserves for roads, and other conditions of similar nature.

"10. Every purchaser will be entitled to name a number of persons of the labouring class for a free passage to the colony, in proportion to the amount of purchase-money which he has paid in this country: viz., for every £20, one adult person of fourteen years and upwards, or two children between seven and fourteen, or three children under seven. The whole must be subject to the approval of the commissioners, and fall within their general regulations on this subject, of which a copy will be furnished to any person requiring them.

"11. Persons who may wish to avail themselves of the above advantage, will be required to send into this office lists of the names and descriptions of the people they propose for a free passage within six months of the date of their purchase, after which time no further claim to any nomination for a free passage will be admitted. Purchasers of special surveys, however, will be allowed eighteen months.

"12. In the older parts of New South Wales, constituting what will henceforward be called the Sydney district, land continues to be sold by auction at an upset price of 12s. per acre, in lots of 640 acres, or one square mile.

"13. Should any person, intending to purchase land in this portion of New South Wales, think proper to deposit money in this country, in the mode above mentioned, he will receive from the Land and Emigration Commissioners an order entitling him to credit for a corresponding sum in the acquisition of land at the public sales in the colony, and he will be allowed to nominate emigrants for conveyance to Sydney, under the same rules and regulations as above referred to for the district of Port Philip.—By order of the board,

S. WALCOTT, Secretary."

Regulations for granting free passages, alluded to in the above paper:—

"1. The emigrants must belong to the class of mechanics and handicraftsmen, agricultural labourers, or useful domestic servants. All the adults must be capable of labour, and emigrate with the intention of working for wages after their arrival.

"2. Persons, therefore, who are proceeding to the colony to buy land, or invest a small capital in trade, are not eligible for a free passage.

"3. The classes most in demand may be described as follows:—shepherds and farm-servants; the trades employed in building, such as carpenters, joiners, plasterers, bricklayers and stone-masons, quarrymen and brickmakers; country blacksmiths, who can shoe horses; wheelwrights, and a moderate number of tailors and shoemakers.

"4. The emigrants are required to consist principally of married people and their families.

"5. Single women without their parents, are only admissible if they are emigrating under the immediate care of some married relatives, or else attached as domestic servants to ladies going out as cabin passengers in the same ship.

"The most useful of this class may be said to be domestic servants, as just alluded to, sempstresses, and young women accustomed to farm or dairy work.

"6. Single men cannot be allowed, except in a number not exceeding that of the single women in the same ship. If named by a land purchaser, they can only be accepted in case the same party has named an equal number of single women who conform to regulation 5.

"7. The age of persons accepted as adults is not to be less than fifteen, nor, generally speaking, more than thirty-five. But the latter rule will admit of being relaxed in favour of the parents of sons and daughters, of useful ages, going by the same ship.

"8. Good character is indispensable, and decisive certificates will be required both to this point and also to competence in the professed trade or calling of the proposed emigrant.

"9. All applications, therefore, must be made in the form hereto annexed for the purpose, duly filled up and attested, as explained in the form itself, and then forwarded to this office.*

"10. For the present, the limited amount of funds does not admit of giving free passages except to emigrants named by parties who have made purchases in this country of colonial land. No others, therefore, need apply, as it will be impossible to comply with their applications.

"11. Purchasers must make their applications within the first six months, after which the right of nomination ceases. Purchasers of special surveys, however, are allowed eighteen months. The nomination will be subject to the approval of the commissioners, whose answer must be received before the emigrants are led to make any preparation.

"12. An early answer will be given. If approved of, the emigrants will be registered in this office as accepted for a free passage, and accommodation be found for them at the first suitable opportunity. But due notice will be given, and they should not in the meanwhile withdraw from their employment.

"13. The emigrants must pay their own journey to the port of embarkation.

14. Provisions, mattresses and bolsters, and cooking utensils, will be found for them. But blankets, sheets, and coverlets, are not supplied, and they must provide a sufficient stock for themselves and their families. They should also bring their own towels, and their own knives and forks, with tin or pewter plates, spoons, and drinking mugs.

"15. The emigrants must bring their own clothing, and cannot be allowed to proceed unless they provide themselves with a sufficient supply for their health during the voyage. The lowest quantity that can be admitted, would consist of two complete suits of *exterior* clothing (including two pairs of shoes), and of six changes of shirts and stockings; but, as a general rule, it may be stated that the more abundant the stock of clothing the better for health and comfort during the passage. I should be observed, that the usual length of the voyage to New South Wales is about four months, and that, at whatever season of the year it may be made, the emigrants have to pass through both very hot and very cold weather, and should therefore be prepared for each.

"16. Each family should furnish itself with two canvas clothes-bags, as the heavy boxes and chests will be put away in the hold, and there will only be access to them once in every three or four weeks.

"17. It is desirable that emigrants should take out with them the necessary tools of their trades: bulky agricultural implements, however, cannot be admitted, on account of their inconvenient size and weight; neither can furniture be received on board—mattresses especially, and feather beds, are strictly prohibited.

"18. The whole quantity of baggage allowed for each adult emigrant is as much as will measure twenty cubic feet, and not exceed half a ton weight. It should be divided, as far as possible, into two or three boxes of not more than two and a half or three feet long, by about twenty inches wide and eighteen inches high. People should not crowd the ship with boxes only half filled, and must pack their effects close.

"19. Only the luggage really belonging to each family of passengers is intended to be taken under the foregoing allowance. If any one should attempt to impose on the commissioners, by letting the baggage of other persons, not members of his family, go under his name, he will forfeit his passage, and not be suffered to proceed.

"Letters and applications should be addressed (post-paid) to Stephen Walcott, Esquire, Secretary to the Board of Emigration, No. 9, Park street, Westminster.—By order of the Board,

"Stephen Walcott, Secretary."

EMIGRATION AND MISCELLANEOUS INFORMATION.

From the above accounts of the various settlements in Australia, it will appear that they are in a condition to receive, employ, and comfortably sustain, an immense population. At present the whole country is only in its infancy, and it is perhaps not too much to say, that fifty thousand families could be accommodated from Great Britain annually, for a century to come. Two or three points are peculiar in the adaptation of Australia to settlers. Some parts are well suited for carrying on agriculture and gardening; but from the dry nature of the climate, the grand object of pursuit must be sheep-farming, and it may be recollected that America and England will take any quantity of wool that can be sent, and for which food, clothing, and all desirable articles, will be given in return. Hence, to become a pastoral farmer may be considered the prime intention of the emigrant who possesses a sufficiency of capital; and to employ themselves as shepherds or to work as mechanics, is what all labourers without capital will naturally turn to.

The rapid extension of pastoral farming in all the settlements, particularly New South Wales, Port Philip district, and South Australia, and the increasing size of towns, along with the stoppage of convict assignment, have caused a most extraordinary demand for labourers, and wages are very high. In a letter from a gentleman at Melbourne (Port Philip), dated July 23, 1840, to his father in this country, and which has been obligingly

* [Applicants, we believe, can procure these blank schedules from shippers of emigrants, who will also show how they are to be filled up.]

shews to us, we find the following passages:—"Melbourne is spreading out daily to a great extent. Labour is the cry. We have had three ships from Mr. Marshall of London, during the last three weeks, each vessel bringing at least 200 emigrants; yet the wages are 12s. per day for mechanics, 8s. per day for labourers, and shepherds £35 per annum, with rations; female house-servants, £20, and female cooks, £25 to £30 per annum, with board and lodging. These are the wages now, and no prospect of a fall. No sooner does an emigrant ship arrive in the bay, than numbers go down and engage servants, and before a week has passed they are all taken up." It is true, the expense of living is higher at Melbourne than it is in this country, but we should suppose not more than a fourth can be reasonably deducted from the rate of wages on this account; and it is very certain that no man or woman of honest character, who is willing to work, need lack the means of a comfortable mode of life, besides the prospect of still greater advantages.

So great is the demand for labourers, that government, as we have seen, hold out the inducement of a free passage to young persons of both sexes, and a portion of all the money laid out in land is set aside as a fund wherewith to accomplish this desirable object. Persons in humble life, therefore, who are of the age, and belong to any of the professions named, can now get a free passage by applying to the proper authorities; and as there are shippers who negotiate these free passages in every principal sea-port, very little trouble need be encountered on the subject. They will be supported for ten days after landing, but it is not probable they will be ten hours without getting into work.

Others who do not come under the class for free passages, or who prefer selecting their own mode of transit, can be at no loss whatever to find vessels fitted for their reception. About the months of March and April of each year, emigrant vessels sail in great numbers to Australia. The same expense, we believe, is incurred for a passage to Sydney, Port Philip, or Adelaide. The common price of passage, including provisions, is, for a single man in the steerage, about £23, and in the cabin, from £55 to £60; for a married couple, somewhat less than the double; and for single females the charge is about £3 less in the steerage, and £5 in the cabin. Children are rated according to their ages from sixteen, at three-fourths of the above rates down to six at one-fourth; when under twelve months old, no charge is made. Each passenger is allowed half a ton of luggage. They furnish their own bedding, and, in the case of steerage passengers, their own spoons, knives, forks, &c. When the passage money, however, is found to be lower than that stated above, it would be well for the intending voyager to see that the difference is not made up by a deficiency in the quantity or quality of his provisions, or that it is not perhaps much more than compensated by some such arrangement, probably, as putting three grown-up persons into one bed, when there are no ordinary ship beds that can with any degree of comfort accommodate more than two.

The usual length of a voyage from England to Australia is from four to five months. The course pursued is across the Atlantic in a diagonal direction to the coast of Brazil, and thence along the Atlantic again farther southward to the Cape of Good Hope. From that southern promontory of Africa, the course is pretty directly east or south-east to the Australian coast. The voyage is almost invariably good, the line pursued being free of any dangerous navigation. The reason for crossing to Brazil, is to catch the winds which blow to and from that part of the American continent, as well as to keep aloof from the coast of Africa. In the course of the voyage, vessels usually touch or go near Madeira, and cross the equinoctial line, after which the voyager is in the southern hemisphere. As noticed in the emigration regulations, the emigrant must necessarily pass through both extremes of temperature, and should therefore be prepared for such.

Emigrants should take no fine clothes with them. All articles of dress should be plain and substantial: an old patched coat in some parts of the country will do equally well with a new one. On this subject, a writer in the Sydney Monitor observes—

"Strangers coming to New South Wales should bring clothes to as many persons as they can, provided they be men of character. But let them not expect any thing more from the people here than a kindly feeling towards them. This they will receive. If they meet with hospitality, it will be likely to do them harm. It will tend to raise in them expectations of rank and expense, which will retard their success, and probably ruin them, by inducing them to borrow money on mortgage, &c. &c.

"However respectable men may have been at home, they should have firmness enough to lay all rank aside when they come here. Let them, for this purpose, sell all their blue coats and yellow buttons, and silk stockings, and enter the colony in a barragon shooting-jacket, waistcoat and trousers, their wives and children wearing dark stuffs, for cheapness in washing, and for durability; and however they may be rallied and tempted by their new friends here to put on better attire, let them turn a deaf ear to such allurements. Let them buy nothing in the way of furniture but rush-bottom chairs and the commonest tables, and bedsteads without posts, which are sold here at 10s. each; and, in short, let them endure the constant reproach of being mean and stingy, until their wool, salted beef, butter and cheese, shall have enabled them to dress and furnish their houses according to their taste. By that time, however, they will have learned to see the folly of attempting any thing in New South Wales, but to be warm, dry, and well fed. And in lieu of improving their external appearance, they will learn the wisdom of laying out their profits in building barns and stables, in fencing in more paddocks, in buying more milch cows and fine woolled ewes, and in buying and renting more land in the distant interior to keep them."

The question may be put to us—"To which of the Australian colonies should we go?" To this it is impossible to give a decided answer. We candidly state it as our belief, that in either one or the other, a sober, industrious, and enterprising person, who will submit for a time to privations, will do well. Let the workman but vow to be *steady* and *sober*, and really be so under all temptations, and we are certain he will gain all the comforts of life, and attain a degree of opulence that he could scarcely have reckoned upon in Britain. Gentlemen from Australia, with whom we have conversed, have assured us, that by avoiding intemperance, every working man may safely calculate on prosperity. Such is the fineness of the climate, that nothing is to be apprehended on the score of health, provided reasonable care be taken. In short, we earnestly recommend the emigration of sober and industrious men and women to Australia. As to which colony they should select, that ought to depend on circumstances coming immediately under their notice. Were we ourselves to emigrate, we should prefer going either to Sydney or Melbourne.

With respect to those who emigrate with capital, sheep pasturing, as already mentioned, will form the more suitable means of existence. The persons to succeed best in this line of business are those who are already acquainted with country affairs. If accustomed to a life of comparative refinement, the settler will be required to forego much that he has hitherto looked upon as essential to comfort. "Can I drive a cart—saddle a horse—kill a sheep—milk a cow—lie on a truss of straw under a tree—cook my own dinner—linger all day long beside a flock of ewes?" are some

ding like the questions which a man should put to himself, and answer satisfactorily, before plunging into the business of an Australian sheep-farmer. Consenting to submit to difficulties and privations, nothing more alarming may intimidate the proposing emigrant. All accounts coincide in representing the business of sheep-farming, or, properly speaking, wool-growing, as most lucrative, and professionally less difficult than it is in Britain. To go into this business, a man should possess a capital of at least £2000, only a portion of which is to be laid out at first, and the remainder as it may appear afterwards advisable. We should recommend young men who have but a moderate capital and little experience, to employ themselves for a time as assistants to the store-farmers. By doing so, there is a plan not unusual, of buying a quantity of ewes and getting permission to rear them with the employer's flock—he, the employer, having a third of the wool and a third of the lambs as remuneration for the keep. A few extracts from letters of settlers will convey more precise information than any thing we can say from our own knowledge.

In a letter from a settler in South Australia, dated April 9, 1839, and published in the *South Australian*, a London newspaper, the following details are given:—"With respect to sheep-farming, there is only one opinion, that it is a certain fortune if a man has sufficient capital to start with, and goes into the country and attends to it. I think this a very good country for persons having £2000 or upwards, and also for the lower class; but young men with a few hundred pounds, and *not able to work*, are sadly mistaken in coming here. I have purchased 600 ewes at 33s. each, and 300 at 35s., and intend getting about 300 more, so as to make two flocks of 600 each. It is usual to have a shepherd and a hutman for each flock of 600—the former at 20s., and the latter at 15s. a week, with rations, which consist of 12 lbs. of flour, 9 lbs. of pork, a quarter of a pound of tea, and 1 lb. of sugar. I shall, however, employ an overseer instead of one of the hutmen, as I find I must be a great deal in town, and have agreed to give him part of the increase of the flock in lieu of wages. I intend sending my sheep to a station about twenty-five miles north from Adelaide: there are some good sheep runs about fifty miles from hence, which is at present thought a great distance, but within a short time it will be thought nothing of."

The following account of the increase of sheep stock is from the *Sydney Herald*:—"Early in April, 1838, Mr. Robert R. Leake, a young gentleman well instructed in pastoral affairs, and formerly employed by the South Australian Company, landed in the province 390 ewes and 10 rams. The dropping of lambs unfortunately commenced immediately after landing, and while the ewes were suffering from the effects of the voyage, so that a considerable number were lost. The produce, however, of the flock, on the 1st June, amounted to 351 lambs. On the 1st of January following, the same ewes lambed the second time, and the produce was 306 lambs, making the increase of Mr. Leake's flock as under:—May 1, original flock, ewes and rams, 400; June 1, increase lambs, 351; January 2, increase lambs, 306; actual increase within seven months, 657; total flock, 13th January, 1057. The lambs of the first dropping will produce in August next, along with the imported ewes, and Mr. Leake calculates that his increase of lambs upon the whole flock during that month will amount to 510, which added to the present flock of 1057, shows an increase upon the original importation of 400, of 1197 within little more than sixteen months."

These statements are fully corroborated by tables annexed to Captain Sturt's Expedition into Australia, who proposes that, with a flock originally amounting to 670, the increase at the end of the first year would be 595, and in five years, the flocks of all ages would be 5464. The cost of 670 sheep is estimated at £1005; the expense of management in the first year, £80, and in the fifth year, £365. For the wool in the first year the settler would receive £213, 9s.; in the fifth year, £922, which, after deducting the cost of management (£365), would leave him an income of £557. The value of the flock is estimated, at the end of the fifth year, at £5851, 15s. Mr. Gouger, in similar calculations, states the increase of stock at 80 per cent., and the loss from deaths at 5 per cent.; the latter, we understand, is rather above than below the mark on an average of seasons.

In the small work, "Three Years of a Settler's Life," we find a letter communicating advice designed for a young emigrant who possessed only a small capital, and from it we take the following extract:—"In the first place, I must acquaint you that £300 is but a drop in the bucket to commence settling with, even if he understood how to make the best of it; however, I think, if he could not employ himself profitably in Sydney, it would do him a service to see the country. But, before he turns settler, he must know how to work. By the by, I will explain how he may invest his capital profitably while he is seasoning his fingers. He must not be above soiling them—he must think it no degradation to load a cart and drive a team of bullocks; in fact, he must be a perfect farmer, and he should and must learn, if he wishes to prosper in this country, to be industrious; he must plough his own ground, sow, and reap, and afterwards not be above grinding it. When he can do all this, and be content that God has given him bodily strength sufficient for it, then he will become a rich man. In seven years' time, with his capital judiciously managed, he will be worth £1500 per annum.

"Let him purchase 300 good sound ewes, and give them out to some honest man on the usual conditions, namely, thirds of increase and wool. [By this is meant, as already said, that the farmer who keeps the ewes is to receive a third of the young lambs and a third of the wool from the flock annually, leaving the two-thirds of increase in both cases as the property of the owner of the ewes.] In three years' time he may begin for himself; he will by that time, if ever, be acquainted with the customs of the country, and probably the management of his own establishment. His accounts will most likely be as follow:—1834, 300 ewes; 1835, 270 lambs, less 90 of thirds; 1836, 270 lambs, less 90 of thirds; 1837, 350 lambs, less 117 of thirds. Total, 1190, less 297, leaving a balance of 893 sheep. The wool account will be—

Nov. 1835.	297 fleeces, at 3 lb. per fleece.		
	891 lbs. wool, at 1s. - - - -	£44	11 0
	270 lambs, 1½ lb.—405, at 1s. - - -	20	5 0
1836.	560 full fleeces, 3 lb.—1680, - -	84	0 0
	270 lambs, 1½ lb.—405, - - - -	20	5 0
1837.	820 full fleeces, 3 lb.—2460, - - -	123	0 0
	350 lambs, 1½ lb.—525, - - - -	26	5 0
		£318	6 0
Deduct one-third for their keep, -	£106 2 0		
Ditto wool bags, - - - - -	20 0 0		
		126	2 0
	Balance, - - -	£192	4 0

Thus, in three years from November, 1834, which we will say is the time he will purchase, he will have 893 sheep, and £192, 4s. returned to him for his £300. This is a moderate calculation, and is most likely to be exceeded; but you will not be able to trace it, as I have cut off for deaths, casualties, odd numbers, &c."

The following are extracts from letters written by two young men, brothers, who left Leith for Port Philip in April, 1839, giving a description of their voyage and settlement. They both possessed a small patrimony which they carried with them as a capital to adventure in sheep-farming, or any other suitable line of business. The vessel in which they sailed reached the Cape on the

30th of July, and Port Philip on the 18th of September, making the voyage in five months. In the first letter, written at sea, after describing the early part of the voyage, and a visit to Bahia, on the coast of Brazil, the writer proceeds—"From Bahia, we got two new passengers who had come from England, and had been forced to put into this port, in consequence of the bad state of the vessel, which was here condemned, and they were waiting for an opportunity of getting forward to Australia. Both are Englishmen, and uncommonly agreeable; and we have got a great deal of information from one of them regarding the Australian colonies, in which he was long resident. He confirms all the ideas I had formed of the country of Australia, and considers that two or three individuals going to the bush and getting some sheep, is the safest and best way for investing a small capital, as a concern of that kind is managed at very little expense, and, with economy, will no doubt pay. When stating my fears of an inexperienced person not being able to go about the matter properly, he said that in three or four months one would acquire all the knowledge necessary; and he kindly said, that, if we chose, we might go to his farm in Van Diemen's Land for six or twelve months, and he would be very glad of our assistance, as the shearing time will be approaching when we arrive, but would not recommend settling there, as he considered Port Philip the best situation. We are, from this and other circumstances, resolved, on arriving at Port Philip, and while the vessel lies there, to take a turn into the country; and should matters be at all as they say, and if we can get our bills cashed at a reasonable rate, we intend remaining there.

"On the 11th we came in sight of land, and by three o'clock afternoon were pretty close in shore, which put me in mind of the Yorkshire coast, precipitous and rocky to the water's edge. The land was covered with brushwood, and looked wild and pretty; and I did not feel at all disappointed with our first view of Australia Felix, though some of our passengers did. The wind continued unfavourable for four days, during which we tacked out and in, making little progress to the eastward [what a want of a steam-tug here!]; but the appearance of the country improved much, being now clothed with forest down to the shore, and we frequently distinguished fires which the natives raised as signals. The land we made first was between Portland Bay and Cape Otway. On the 17th, we entered Port Philip Bay by a very narrow entrance, not more than half a mile broad; but on getting through what are called the 'Heads,' the bay opens up into a fine sheet of water, somewhere about thirty miles long and twenty broad. The country on each side is richly wooded, and rather high. We sailed up in the afternoon, the bay being as calm as a loch, with the sun shining clear and beautiful, and making us pleased with the new country. We got ashore in the morning, and found that we had to walk two miles to Melbourne. The appearance of that town, the capital of the Port Philip district, was strange to us—a great many brick houses and tents being scattered about here and there. The price of provisions is astonishingly high, but is more than compensated by proportionately high wages. All the mechanics on board were engaged the first day at 12s. per day, and people waiting and coming on board to get them. We had our bills discounted—the thirty days' ones at 2 per cent. premium, and we got 5 per cent. interest from the banks for deposits for money lent, the common rate is 15 per cent. The price of sheep is high, from 30s. to 40s., but after the clipping time they will fall, and so also will the other provisions, as there is promise of an excellent crop. This is really an astonishing place, for two years ago there was nothing but a few mud huts and tents, and now it is assuming the appearance of a regular town. Already, the port is supplying other places with cattle and sheep; there are now four square-rigged vessels lying here, one of them waiting for a cargo of wool for London, besides various small craft engaged in the coasting trade. We will go into the country, and should we not meet with any thing to suit us in the way of a situation (for we will not lay out our money till we acquire a knowledge to do so advantageously), we will return to town, and have no doubt of getting employment."

Our next extract is from a letter dated January, 1840. "When I wrote on arrival, I did not think it would be advantageous to buy sheep, from the highness of their price. I could have got a situation in a merchant's office in Melbourne, with a salary of £130, but, after all, did not like taking to the pen again. Having been introduced to Mr. ——, we visited his station, about seventy miles from Melbourne, and there we bought 500 ewes. We lived there nearly two months, and got a good deal of insight into the business of sheep-farming. were it such a science as it is at home, I would feel a little afraid of succeeding, but there is really no mystery about it. We left that station the day after Christmas, and proceeded with our sheep about twenty-five miles further up the country, where we are now settled, and have got our hut erected. It would be impossible to give you an outline of all the adventures we have encountered up to this time, and I am so hurried as to be able to write only in snatches. You will have heard that we are settled in company with Mr. —— and Mr. —— [two acquaintances], which is for the purpose of avoiding the expense which a small number of sheep take." Here we stop to say, that in a letter from the other brother, it is explained that they had procured a license from government to graze and pasture in a certain district, thus avoiding the necessity of buying land; and the following account is given of the sheep-purchase and plan of settlement:—"We have, after many doubts and fears, fairly commenced sheep-farming, having purchased 1080 full-monthed ewes at £1, 2s. each, merely as a sort of beginning. There are four of us concerned in the undertaking. We have begun on a very economical system, managing the sheep ourselves, one of us going out with them for a week alternately, while the others are doing any thing about the place. We run the whole in one flock, till the lambing, which takes place about the middle of March, when we will require to take another man. We have one man-servant already, who drives and looks after our bullocks, besides making himself generally useful. The sheep require the utmost care and attention possible. One has to take them out at sunrise, so as to get the dew, and remain with them the whole day, bringing them back at sundown. They require to be always watched, both in consequence of the natives and wild dogs; the dogs are most to be feared, as they often rush into the flocks by day, and sneak into the pens at night. We have as yet escaped both evils, but I have seen as many as six killed in a flock in one night by the wild dog. The sheep here are very subject to a disease called scab, but it just requires care in looking after to be kept under. I think, if wool keep the same price, we will get about 1s. 5d. per pound, the produce averaging 3 lbs. per sheep, washed. I hardly think the wool will clear our expenses this year, but then we have the increase always coming on; and although the way we live is far from comfortable, in a wretched turf hut, shut out in a manner from all the world and every sort of society, still I have no doubt the thing will pay."

Speaking of the appearance of the country, one of the writers observes—"The aspect of the country, as we are aware, is flat, and appearing at a distance as thickly wooded; but when you enter this woody district, you find generally the trees a good deal separated from one another, with sward among them. This

considered the best ground for sheep, as it affords good shelter from the cold, and shade from the sun. There are really many beautiful parts, and more like the park scenery around a nobleman's seat than a wilderness. But there are other places which look as wild and bleak as you can conceive—immense plains with nothing but short grass on them—no water—and stretching away to the horizon. You cannot see a tree or any thing on them; and they are only inhabited by wild dogs, turkeys, and snakes. The grass in most part of these plains affords excellent pasturage for sheep, but, from the want of wood and water, they are useless. You must be near some river or water-holes, in order that the sheep may drink every day; this they will always do when there is no rain and the weather has been dry for some time, when the grass becomes so dry, that if you take a little you can rub it in your hands till it is like snuff. Our place is very pretty, being on a creek or water-holes, which are connected with a river, of which we do not know the name. These water-holes [or series of pools] run during winter, but become dry in the summer, except the very deep holes. Adjacent are some large gum-trees, some fallen into the water, and some half buried, but still flourishing, with the grass long and luxuriant, and forming excellent feeding for our bullocks. Our hut is placed a few yards from these holes, with the sheep yard immediately behind; on one side we have a woody country, going back nobody knows how far, affording shelter to the natives, kangaroos, and emus."

From other passages in these letters, we learn that the writers are far from being satisfied with their situation—the miseries of living in a turf-built hut—the swarms of fleas—the dreadful solitude they are compelled to endure, being twenty miles from any other settlement—their half-savage mode of life—their recollections of home—all tend to inspire distaste of their lot. We believe that such sensations are common to all young emigrants who have abruptly left refined society and plunged all at once into the novel career of sheep-farming in the wilderness. It is of importance to observe, that no one in such circumstances can reasonably expect to avoid experiencing such sensations. Take any man from a counter or desk, much more from a respectable drawing-room, and oblige him to attend to the drudgeries of sheep-farming even in Lincolnshire or Roxburghshire, and he would in all likelihood feel precisely the same disgust. But such disagreeables must only have a temporary operation. After a little while, the man's nature will become in some measure accommodated to them: they will be in themselves diminished, and other circumstances will arise to palliate and compensate for them. All, then, that the emigrant has to contemplate at the beginning is, how he is to get over the first shock. That passed, it is to be hoped that, with a fair share of vigour and perseverance, he will begin to find pleasures he did not contemplate in a simple rural life.

The last letter of our two young friends, dated June, 1840, tends to support these views. It is written in a much more cheerful spirit than those previously sent, things having begun to improve in appearance. The lambing season had passed, leaving fully a thousand young lambs, and another dropping equally good was expected in November; "but," says the writer, "there has been a great outlay, and there will be little return till the third year; the wool should then pay all expenses, the increase of flock being the profit. The first stock we will have to sell will be wethers, which are at present selling for 20s. each." The party had also begun to cultivate a few acres of land, for the purpose of raising wheat, which is excessively expensive in the colony, also to lay out a garden, and to rear fowls. The only drawback, it is added, is the *want of labourers*, and this keeps every thing behind. The writer now rather laughs than laments over "the domestic arrangements" of the hut: one of his companions had commissioned a wife from Scotland, and sent for two nephews to assist in the farm, while all were looking forward to a course of moderate prosperity and comfort.

EMIGRATION TO VAN DIEMEN'S LAND AND NEW ZEALAND.

VAN DIEMEN'S LAND.

GEOGRAPHICAL POSITION AND GENERAL HISTORY.

Van Diemen's Land is an island lying off the southern extremity of the mainland of Australia, from which it is separated by a channel 120 miles broad, called Bass's Strait. Its situation is between latitude 41° and 44° south, and between longitude 144° 40′ and 148° 20′ east of Greenwich. The length of the island is about 210 miles, and its breadth 150. It was first discovered in the year 1642, by Abel Jansen Tasman, a celebrated Dutch navigator, and was by him called Van Diemen's Land, in honour of Anthony Van Diemen, at that time governor-general of the Dutch possessions in the East Indies. Nothing, however, immediately resulted from this discovery, and for upwards of a hundred years the island was lost sight of. In 1773, it was visited by Captain Furneau, the first English navigator who had ever touched at it; after this it was visited from time to time by several celebrated navigators, and among these by Captain Cook, in the year 1777. It was not, however, until 1803 that any settlement was made upon the island; in that year it was formally taken possession of by Lieutenant Bowers, as a receptacle for convicts, with a party from Port Jackson, in New South Wales, where a penal establishment had been already fixed; and to this purpose Van Diemen's Land was exclusively devoted until the year 1819, when it was thrown open to free settlers. It is thus only since the very recent period just named that it has exhibited the character of a colony. Its progress, however, has been since then extremely rapid. Van Diemen's Land is sometimes called Tasmania by its inhabitants, in honour of Tasman its discoverer.

The continent of Australia and Van Diemen's Land are totally different in character, the one being flat and ill-watered, so as to be suitable chiefly for pasturing while the other is mountainous, and more resembling Ireland or Scotland. The appearance of Van Diemen's Land from the sea is exceedingly picturesque, presenting an endless succession of lofty mountains, covered to their summits with wood; while tall rocks and precipices, glens and hills, contribute to increase the interest of this

romantic island. Nor does a nearer inspection materially alter this general character of the scene.

On traversing the island, it is found to present a constant alternation of hill and dale, with occasional flats or plains; but these are comparatively few in number, though some of them are of great extent, consisting in several instances of not less than from 8000 to 10,000 acres, and one in particular is said to be six miles in length, and from two to three in breadth. These plains are in general exceedingly fertile, and being often but thinly interspersed with trees, present a most delightful appearance. There are some of them, again, very poor, presenting a cold thin soil, of little value. Van Diemen's Land, though it cannot be called a well-watered country, is yet much superior in that respect to New South Wales. Besides several extensive lakes scattered throughout the interior, it possesses a considerable number of rivers; and in almost every district of the island water is to be found. The names of the two largest rivers are the Derwent and the Tamar.

In another important particular, this island is peculiarly fortunate, that is, in the number and capacity of its harbours, no place of similar extent in the world probably being equal to it in this respect. The principal harbours are—the Derwent on its southern side, Port Davey and Macquarrie Harbour on the western, Port Sorrel and Port Dalrymple on the northern, and Oyster Bay and Great Swan Port on the eastern coast. Besides these, there are many other harbours, bays, and creeks, distributed along its shores. The coast is in general high and rocky, particularly on the south, east, and western sides of the island: on the north, however, it presents a line of low alternate sandy beaches, on which the surf rolls with great impetuosity during the prevalence of northerly winds. From the extremely hilly nature of the country, there is but a comparatively small proportion of it adapted for the plough, though presenting abundance of excellent pasturage. The extent of really available land throughout the known part of the island, has been estimated at one-third of the whole, and this is again divided into four parts, giving one for the plough and the other three for pasture: thus, out of 1000 acres of land, about 100 will be found fit for cultivation, and from 300 to 400 for grazing. This is, of course, a rough estimate, and may be found not to be correct in many instances, but in general we believe it will not be far from the truth.

DIVISION—DISTRICTS, &c.

Van Diemen's Land was originally divided into two counties, Buckingham and Cornwall; the former occupying the northern, and the latter the southern portion of the island. These counties have been again subdivided into the following districts:—Hobart Town, New Norfolk, Richmond, Clyde, Oatlands, Oyster Bay, Campbelltown, Norfolk Plains, and Launceston.

Hobart Town District, though the smallest in extent of any in the island, is yet the most important in the colony, as well from the circumstance of its including Hobart Town, the capital of the island, as from its possessing many superior local advantages; and, among these, that of its being accessible by water on three different sides—by the Huon river, which forms its southern boundary, by the Derwent on the north and east, and by the sea on the east. The whole district, including the island of Bruny, which lies off the mouth of the Huon river, and forms part of it, comprises 400 square miles, or about 25,000 acres. The country in this district, however, is in general so hilly, that out of these 25,000 acres there are not above 1600 under tillage; and it is said that the first cost of clearing and preparing these lands for the plough greatly exceeds what they would now bring altogether if put up to public sale. The best and principal farms here are situated on the banks of the Derwent, and south of Hobart Town in the direction of Fairlie's Cove; behind this, interiorly, there are but few locations, nor does the appearance of the country tend much to invite future settlers, the soil being in general so thin, and so heavily encumbered with trees, that even its vicinity to the capital is scarcely an inducement sufficient to any one to attempt its cultivation.

In this district, Hobart Town, the capital of the colony, as we have already said, is situated. Hobart Town is built on the left bank of the River Derwent, at the head of a beautiful cove or bay, distant about twenty miles from its junction with the sea. The town is pleasantly situated on a gently rising ground, which, gradually retiring, terminates ultimately in hills of considerable height, covered with wood, and presenting a most romantic appearance. These, again, are overlooked by one of still greater altitude, called Mount Wellington, which rises to the height of 4000 feet above the level of the sea. Hobart Town is thus happily placed between highly picturesque hills on the one hand, and a beautiful bay or arm of the sea on the other; for, though the Derwent be here called a river, it can so be called only in a very extended sense, the water being still salt, and of considerable width. The town itself covers somewhat more than a square mile of ground; the houses are principally constructed of wood, though many of them are of brick and freestone. The streets are regularly laid out, and those of them that have been completed are macadamized, and present on either side long rows of large and handsome shops. The town derives a peculiar and highly pleasing character, too, from the circumstance of the houses in general standing apart from each other, each having a small plot of ground, from a quarter to a half an acre in extent, attached to it. Its public buildings are numerous, and many of them would be considered handsome even in Britain. The town contains breweries, tanneries, distilleries, flour-mills, two or three banks, hospitals, churches, schools, charitable and stipendiary, inns, taverns, hotels, and grog-shops *ad infinitum*, and every thing else which bespeaks a thriving, bustling, industrious, and civilized community. Nor are they behind in the department of literature: two or three newspapers are here published weekly, besides a yearly almanac, containing a great deal of statistical and other interesting information regarding the colony, and an official gazette.

New Norfolk District lies immediately behind the former, and is entirely inland, no part of it approaching the sea: its extent from east to west is about fifty miles, and from north to south about thirty—thus comprising 1500 square miles, or 900,000 acres. This district is in general much more fertile than that of Hobart Town, returning on an average from six to eight bushels of wheat per acre more than the latter. The farms, too, are of much larger extent, many of them amounting to 2000 acres, some of which are delightfully situated on the banks of the Rivers Derwent and Jordan, the latter of which streams, after passing through an exceedingly beautiful tract of country, ultimately falls into the former at a place called Herdsman's Cove. In this district there is also a large proportion of rich sheep pasture. New Norfolk is intersected, in a north-westerly direction, by a chain of lofty mountains, covered with the most magnificent timber, and exhibiting snow on their summits throughout the greater part of the year. From its vicinity to Hobart Town, and the advantage of water carriage which the lower part of the district possesses, there is a greater proportion of agricultural produce raised in it than in many of the other districts. It is remarkable, however, that, with all its superiority of soil, its crop of potatoes is about one-seventh less than that of the Hobart Town district. Here is a pleasantly situated little town or village, bearing the name of the district, and distant

from Hobart Town about twenty-two miles. A coach and van, the former with four horses, and the latter with two, run daily between it and Hobart Town; besides these, there is a steamboat plying on the Derwent between the two places.

Richmond District extends on the sea-coast, from Prosser's River to Tasman's Peninsula, a tract of uninterrupted sterility, being rocky, mountainous, and barren to the last degree. The ridge of bleak and unproductive hills which run through this whole length are heavily timbered, and never can be made in any way available to the purposes of man. On the side next the Derwent, however, which bounds it on the south, though still hilly, there are a number of beautiful and fertile valleys; and around Pitt Water, a salt-water lake of six miles in length and three in breadth, there is a considerable portion of comparatively level land of the first description, and well adapted for agricultural purposes. In this district there are two towns or villages, Richmond and Serrel; the first fourteen, and the second twenty-two miles distant from Hobart Town. In the latter there are several good inns, a parsonage-house, church, jail, &c.; the former is not so well furnished with inns, but there are several respectable private houses. Serrel is situated in the fertile locality of Pitt Water, and is surrounded on all sides with rich and highly cultivated farms. This district contains altogether about 672,000 acres, or about 4050 square miles.

Oatlands District is separated from the sea by part of the Oyster Bay district, and bounded interiorly, or on the west, by the district of Clyde, and on the north by that of Campbeltown. This district is comparatively but of small extent, and forms a square of about thirty miles on each side, containing 900 square miles, or about 576,000 acres. Though one of the smallest subdivisions of the land, Oatlands is one of the best, possessing, perhaps, a greater proportional extent of cultivatable and grazing land, and that of the finest quality, than any other locality of similar bounds in the island; its beautiful open and extensive downs afford the richest pasturage, and its arable lands are equally fertile and productive with the best in the colony. It is besides most advantageously situated, occupying a central position between Hobart Town and Launceston, the next town in the island in extent and importance to the former. The advantages which this district presents have been duly appreciated, and a greater proportion of it, taking its limited extent into account, has been located than of any other district in the colony. Coal is found here, but in too remote a situation to afford any profit in the working. Within this district are situated what are called the Salt-pans Plains, a beautiful level tract of fertile country, of many miles in extent, terminated in the distance by lofty ranges of the most magnificent hills. These plains derive their somewhat singular name from three small lakes, or ponds, which are so strongly impregnated with salt, that they yield by a natural process many tons of that essential article of life annually. This salt is not equal in quality to English salt, but nevertheless, brings 10s. a hundredweight in the colony. The town of Oatlands, situated in this district, fifty-one miles from Hobart Town, contains a military barracks, a jail, an inn, several large stores, and a number of well-built houses.

Clyde District comprises about 1700 square miles, or 1,088,000 acres. This district is in general hilly, but affords excellent and extensive pasturage. Its remoteness from Hobart Town, and the difficulty of transporting agricultural produce to that market, from want of good roads, has tended to keep it almost exclusively a pastoral district. The proportion of cultivated land here is exceedingly small. Some of the best grazing-farms, however, in the island, are to be found in this district, many of them covered with the immense flocks and herds of the various settlers. This district has the advantage of many of the others in the colony in the essential article of water, no less than five different rivers running through its bounds; these are the Ouse, Shannon, Clyde, and Jordan. From its elevated situation, the climate here is considerably colder than in the districts nearer the sea; and even in summer, slight hoar-frosts are not unusual at a very early hour in the morning. This circumstance has particularly affected the crops of potatoes which have been attempted to be raised here, and which in consequence exhibit such a poor return as almost amounts to a total failure. The principal township in the district is Bothwell, distant forty-five miles from Hobart Town: there is an excellent inn here, a court-house, church, and a considerable number of respectable private houses.

Oyster Bay District is bounded by Richmond on the south, Oatlands and Campbeltown on the west, and the sea on the east. Oyster Bay district takes its name from a beautiful bay situated within its limits, and which affords excellent anchorage for ships, and is reckoned altogether one of the finest harbours in the island. It is separated from the adjoining districts by a lofty range of mountains, which run from north to south throughout its whole length on its interior side. This district is about the same extent with that of Oatlands, comprising 900 square miles, or about 576,000 acres. It does not exhibit any general traits of character differing from the others. In common with these, it possesses large tracts of fine pasture-lands, but there is little yet under the plough. A great portion of the wealth of this district is derived from whale-fishing, a considerable number of these animals being every year taken in Oyster Bay.

Campbeltown District lies between Oyster Bay district on the east, and Norfork Plains on the west, and comprises about 1260 square miles, or 85,000 acres. This is one of the finest districts in the whole island, and is every day increasing in prosperity and importance. The peculiar richness of its herbage adapts it in an especial manner for the rearing of cattle; and this is so well known and so universally acknowledged in the colony, that the butchers of Hobart Town come hither to make their purchases of fat stock, though at the distance of seventy miles, in preference to drawing them from the more immediate districts of less celebrity in this particular. Among other delightful tracts of grazing-land which this district presents, there is one of superior fertility formerly called the Ross Reserve, from its having been kept possession of by the crown for its own purposes. When this reserve was exposed to sale by the government, in lots of 4000 acres each—the whole tract comprising about 32,000 acres—it brought readily from 16s. to 20s. per acre. One lot sold as high as 29s. per acre. Each of these lots has a frontage to the Macquarrie River, from which they run backwards about six miles. At Ross there is an annual cattle-market, and a yearly display of horse-racing. The agricultural produce of this fine district is equally remarkable with its pasturage; and for barley especially it seems to be singularly well adapted, the average return of that crop being not less than forty bushels per acre. The chief town of this district is Campbeltown, which contains many well-built houses, stores, inns, &c.

Norfolk Plains District.—By including this district, we have now crossed the island from north to south, and arrived at the shores of Bass's Strait, which separates Van Diemen's Land from New South Wales. Norfolk Plains district comprises 2250 square miles, or about 1,500,000 acres. This division of the island presents a very different aspect from that of which we have just been speaking, being generally mountainous and barren; and when it is not absolutely either, the soil is often poor, thin, and comparatively unproductive.

Launceston District completes the catalogue of the

political divisions of Van Diemen's Land, and is the largest of them all. It occupies the north-eastern corner of the island, ending at Cape Portland, having Bass's Strait on the north-east, and the Pacific Ocean on the east, with a coast-line on the former of about seventy miles, and on the latter of about fifty-five. It is estimated to contain 3800 square miles, or about 2,500,000 acres. The greater part of this extensive district is wholly useless for any of the purposes of man, being barren, sandy, rocky, and mountainous, and in many places altogether inaccessible. Notwithstanding of this, however, it is considered the next in importance to the Hobart Town district, from the circumstance of its possessing the second largest town in the island, namely Launceston, situated at the junction of the North and South Esk, at the head of the navigable portion of the River Tamar, which discharges itself into Bass's Strait, about forty-five miles below the town. The town presents a very business-like appearance, with its shipping, wharfs, stores, and public buildings, all calculated to impress the stranger, even on a cursory glance, with a favourable idea of its rising importance. The court-houses, soldiers' barracks, female factory, &c., stand near to the junction, in a very fine situation. The male prisoners' barracks lie near to the North Esk. There are two finely-built churches here, the Episcopalian and the Scottish Presbyterian, with numerous and highly respectable congregations. There are, besides, meeting-houses of various other sects, all of whom receive pecuniary support from government, in proportion to the number of members who attend them; also several societies of a benevolent and useful character, deriving their chief support from the liberality of the inhabitants. The exchange or reading-room, which would not disgrace some of the more populous towns of Britain, contains an excellent selection of papers from the other colonies, as well as from the mother-country. There are several banking-houses, inns, warehouses, and shops of a superior kind, having almost every necessary and luxury used in civilized life, and which are obtained at very moderate rates. The private residences of the inhabitants are elegant and substantial, and prove that both the architect and the tradesman are to be found in this colony. From the favourable nature of its situation for commercial purposes, the river being navigable for vessels of 500 tons burden up to the town, the trade of Launceston is very considerable, and is every day increasing. The chief exports are wheat, bark, wool, and whale-oil. In connection with the post-office, custom-house, and commercial establishments, a telegraph has been erected on an eminence called the Windmill Hill. This is of great consequence to the merchants, who ascertain, by a code of signals devised for each mercantile house, when a vessel either enters or clears the heads of George Town; the vessel being scarcely at the cove, when the owner or consignee, thirty miles distant, is put in possession of the fact, through this excellent medium of communication, where steamboats or stage-coaches are yet awanting. There is a strong probability, however, from the enterprise hitherto displayed by the inhabitants, that this want will not have to be long complained of.

Mr. Russell, a young Scotchman, made a tour in the Australian colonies in 1839, during which he paid a visit to Launceston district in Van Diemen's Land; and from his remarks on the country we offer the following extract:—

"The banks of the river Tamar are of the most romantic description, rather thickly timbered, with here and there a comfortable-looking residence, having the land cleared in its neighbourhood: the fields produce excellent crops. Several flour-mills, &c., are here also, these having great facility in conveying produce by boats to any place either up or down the river

"The appearance of Launceston harbour, from its natural advantages combined with a class of very enterprising merchants, would lead one to suppose that they were entering a port in old England. The shipping of this place has increased very much of late, both in tonnage and in number. Where vessels of 150 tons burden were formerly brought up with difficulty, others of 500 tons now fill their place easily, many of those at present here conveying immense quantities of wheat, flour, and hay, to Sydney, Adelaide, and Port Philip, the late drought having caused a scarcity in these colonies, while this part of the island, from its geographical position and richer soil (though limited), grew crops sufficient to prove its superiority as an agricultural district. Any one visiting the farms on the banks of the Tamar, North Esk, or Norfolk Plains, will cease to wonder at the shipments of grain and other produce. It has formerly been termed the granary of New Holland, and now fully realizes the title. Farmers usually get convict labourers assigned to them by government, which is of much consequence, where free labour is yet scarce. Extensive establishments are provided with one or more mechanics; they being of greater value, are estimated as worth two or three labourers, and assigned accordingly. Female convicts are also assigned; the parties binding themselves to furnish all such servants with rations and clothing, agreeably to a government-scale furnished them.

"There are some fine thriving country towns in this northern district, among them Campbelltown, Longford, Evandale, and Perth, which is beautifully situated on the banks of the Esk. Two bridges of considerable dimensions are in process of building across this river, the churches, mills, &c., forming a most picturesque scene. There are also stores for merchandise, and inns for accommodation—two very necessary appendages in country settlements.

"The roads in Van Diemen's Land are rather superior, from the quantity of metal always to be had, and the numerous chain-gang parties constantly employed in making and repairing them. Tolls are yet unknown here. In general, the drays used for conveying all kinds of material, are drawn by teams of bullocks, consisting of from two to eight in number, as the occasion requires. The traffic along the different roads with vehicles of all sorts is very great, including mails, stage-coaches, tandems, &c., up to the rolling carriage with liveried servant; some the result of unsurpassed industry, and some through means more equivocal. There are many singular instances in the changes of fortune these colonies have produced on the persons and in the circumstances of individuals sent out here for punishment originally.

"The road between Launceston and George Town is at present but a bush one, every one striking off the different turnings as their fancy of saving distance leads them, always converging to the common track at some place or other. At present, however, there are some gangs at work, forming an excellent road, which will soon be in use. I had a good opportunity of seeing the fertility of soil on the banks of the Tamar, when on a visit to a family, and of being still more strongly convinced, that here, as everywhere else, farming requires considerable attention in taking the advantage of seasons. During the past season, notwithstanding the drought, this industrious class have had excellent returns from their crops. The growth of vegetables, &c., at this farm, particularly attracted my attention beyond any thing I had ever seen in Europe.

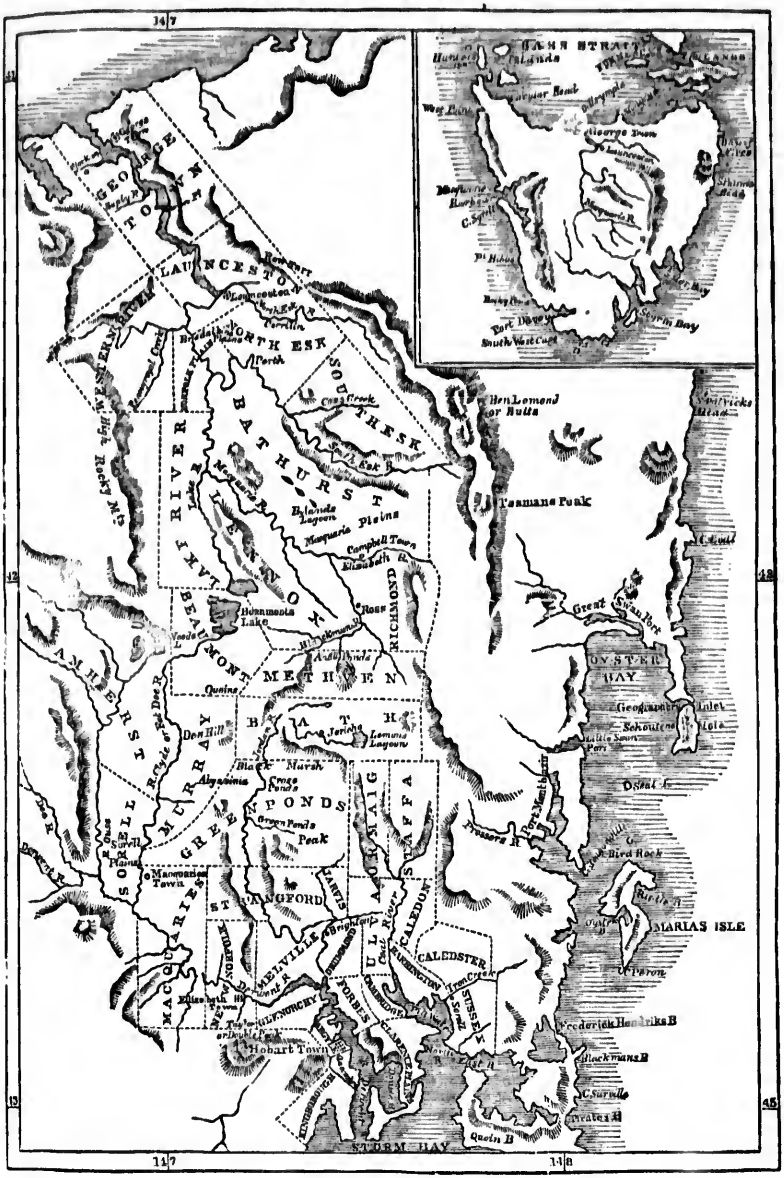
"Among the many instances of individual enterprise that could be given, is one, where a bridge connecting the north and south banks of the North Esk, was erected through the spirited exertions of a merchant, who is a native, and an honour to the colony which gave him birth. This erection is a fine light structure, and suited for all

purposes. I understand that government afterwards compensated this gentleman by some grants of land.

On Norfolk Plains are some extensive and fertile farms, having very excellent steadings. The houses are principally built of brick, having the roofs shingled, that is, covered with pieces of wood similar in size and shape to the common slate.

It has been remarked by almost every one who has visited this island, that cattle and horses thrive remarkably well upon it. The horses used in harness struck me as being much finer than those across the straits, where they exhibit a more relaxed appearance. Here, from the climate being rather cooler, the richness of food grown, and moderate labour, they exhibit plumpness and action at the same time, superior to what I saw in South Australia. Shortly before my arrival in Launceston, there was said to have been a fine display of saddle-horses at the annual races, which took place on the

MAP OF VAN DIEMEN'S LAND.



course, a flat piece of ground on the bank of the North Esk, well laid off, and having high land in its neighbourhood, apparently very suitable for such a purpose. There is also sport of another kind to be had with the kangaroo and opossum, which are very plentiful on this island. The skins of these animals are converted into many purposes, such as shoes, rugs, &c.

"The land on the North Esk, and that which runs in the line of road to Hobart Town through Perth, Ross, and Campbeltown, as far as Oatlands, is tolerably well cleared of timber, and many extensive fields of corn, &c., are to be seen. This latter place lies about the centre of the island. The country from thence towards Hobart Town becomes very hilly, with here and there a few farms in the valleys; the bush, of course, having sheep, horses, and cattle in abundance depasturing on its soil. The harvest of Van Diemen's Land generally commences in February. Around the capital are said to be some fine spots. The government gardens, about three miles distant, are considered worthy of a visit, from the many exotics and fruits grown there—apples, pears, and all other English fruits, growing to great perfection. The grapes raised against the wall are as large as those of Spain or Portugal; but a friend who has spent much time in all these places considers this Tasmanian crop deficient. As in the other colonies, many of the settlers here have been officers in the army and navy, grants of land being given them on retiring from active service, which has, no doubt, tended much to the formation of an excellent community. Many civilians who ventured their future happiness by emigrating to this island, have been very prosperous, principally by dint of determined perseverance."

CLIMATE, SOIL, NATURAL PRODUCTIONS, &c.

The climate of Van Diemen's Land is exceedingly pleasant and salubrious, and is especially adapted to the constitutions of the natives of Great Britain; the heat in summer is not so intense as that of Australia, not often much surpassing that of London or the southern parts of England; while the mornings and evenings, even at the hottest periods of the year, are always cool and agreeable. The cold in winter, however, though mild when compared to what we experience at that season, is more intense and of longer duration than that of Australia, snow lying frequently on the higher mountains throughout the greater part of the year; but in the valleys and lower districts it seldom remains more than a few hours. There have not yet appeared any diseases which can be said to be peculiar either to the climate or to the island; and, on the whole, the chances of life are estimated to be considerably more in favour of Van Diemen's Land than of Britain or any other of the most healthy parts of Europe. Colds are sometimes caught in winter, but never prove fatal unless neglected. It is not subject to any extremes of heat or cold: the seasons are regular, mild, and agreeable; the atmosphere constantly pure and elastic; and the sky clear, unclouded, and brilliant. The average number of days on which rain falls throughout the year, is from fifty to sixty. The island possesses a considerable variety of trees and shrubs. The gum-tree is the largest; and there are numerous others well adapted for ship and house building. The trees are all tall and straight, branching only at the top, and they are nearly all evergreens. The bark of the trees is in general of so white a complexion as to give them the appearance of having been peeled, and their leaves are long, narrow, and pointed. All the vegetables and fruits known are cultivated in England and Scotland, are raised without difficulty—apples, pears, plums, gooseberries, &c., to which the warmer temperature of Australia is unfavourable, are produced here in great abundance and of excellent quality. Both the climate and the soil are sufficiently favourable to the production of most descriptions of grain; wheat is found to thrive remarkably well; potatoes are in general a good crop, and of excellent quality. The island is altogether, in short, fit for all the purposes of agriculture aimed at in this country, being neither more nor less favourable to them, but in all respects nearly the same; its climate being ours, only somewhat modified, and its soil in general not materially differing in quality. Its animal productions are nearly the same with those of Australia, consisting of the kangaroo, opossum, squirrel, &c. The native dog, however, so well known in the former country, is not to be found here; but in its place there is an animal of the panther tribe, which, though it flies from man with the timidity of a hare, is yet extremely destructive to the flocks of the settlers, among which it frequently commits the most dreadful havoc. This animal attains considerable size, having been found in many instances to measure six feet from the snout to the extremity of the tail. The birds of Van Diemen's Land are the emu, or Australian ostrich, parrot, cockatoos, herons, swans, pelicans, &c. There are here, too, a considerable number and variety of poisonous reptiles; but these, on the whole, are neither so numerous nor so venomous as in the sister colony.

The seas around Van Diemen's Land abound with whales, dolphins, and seals, and its shores with shell-fish, particularly the mussel, these last literally covering the rocks on its coast, and in its bays, creeks, and harbours. Oysters were once plentiful, but they have become almost extinct.

The leading if not almost the only misfortune under which Van Diemen's Land labours, is a deficiency of good roads. This prevents all communication on a profitable or convenient scale, except in the few cases in which proper thoroughfares have been made. Mr. Dixon, a late writer on the country, observes, that the cost of transporting farm-produce a distance of thirty miles, is as great as is the cost of bringing the same quantity of articles from Great Britain; in other words, a barrel of beef can be sent from London to Hobart Town for the same price as it could be sent from thirty miles inland to Hobart Town. If this be true, it is a fact most disgraceful to the local authorities; for without good roads it is utterly impossible to carry on agricultural operations with advantage.* The statistical accounts of the island mention, that latterly great improvements have been made in this respect, there being now upwards of 100 miles of macadamized roads in the colony, also several bridges, and good cross-roads; but we fear that much still remains to be done to extend the means of communication.

GOVERNMENT.

Van Diemen's Land is now an independent British colony. Till the year 1825, it was a dependency of the colony of New South Wales, but in that year it received a government of its own. The internal policy of the island is now conducted by a lieutenant-governor, and an executive and legislative council. There are also here a chief-justice, attorney-general, and all the other appendages of a supreme court of judicature, courts of requests, attorneys, barristers, solicitors, proctors, sheriffs, justices of the peace, and the whole of the paraphernalia of civil and criminal jurisprudence known in this country. There are, besides, as in New South Wales, a number of police magistrates, each having a separate and distinct district under his judicial authority; these are, as in the former case, stipendiary. The laws here are the same with those in England, in so far as the circumstances of the colony will admit. The members of all the civil institutions are appointed by the crown, consisting, in the

* Mr. Dixon's observations on the state of the roads are completely at variance with those which we have quoted from Mr. Russell. Perhaps the roads are good in one or two lines of route, but indifferent in others.

executive council, of four in number, including the governor, and in the legislative of fifteen, also including that officer. The expense of the judicial department amounts to about £13,000 per annum, and the ecclesiastical to about £6500. The military and convict establishment are paid by the mother country. The governor's situation is reckoned worth £5000 per annum, although his net salary is only £2500; the difference is made up by taking into account various items, such as furnished houses, gardens, farms, servants, horses, cattle, sheep, pigs, poultry, fish, &c.

Society in Van Diemen's Land, like that of New South Wales, is made up of free settlers who have emigrated from this country, and of convicts. Society is so much alike in both countries, that it is unnecessary for us to say any thing regarding it in this article. The convicts in Van Diemen's Land are in all respects treated the same as in New South Wales, to which article we refer for particulars. There are no aborigines now in Van Diemen's Land, these having been lately conveyed to an island in Bass's Strait, and an ordinance has been issued by the home government for their removal to Port Philip district, New South Wales. Regarding the bush-rangers, or runaway convicts, from the effective police force kept up, their depredations are confined to the less populated districts, and even there they seldom exist long without being captured. We understand, that while we are now writing, measures are in the course of adoption for entirely altering the mode of convict management and labour, and leaving the colonists to be more dependent on the assistance of free labourers than formerly. Correct information may be obtained on this point on arrival in the colony.

We gather the following information respecting the condition of Van Diemen's Land from an official return, drawn up by the Colonial Secretary to the government for the years 1836–7–8, and published in the Hobart Town Courier, 1839. It appears that the fixed revenue of the colony has increased from £91,320 in 1835 to £98,081 in 1838, although in the interval there has been a decrease of £18,000 on the annual revenue from spirit duties. The number of licenses granted to publicans and wholesale dealers in spirits has been considerably diminished. The annual expenditure of the colony has correspondingly increased from £103,027 in 1835 to £133,681 in 1838: much of this increase, however, is caused by the colony now bearing the cost of the police establishment, formerly paid by the home government. The number of vessels cleared inwards in 1835 was 229, with a tonnage of 55,853; in 1838 the number of vessels had increased to 370, with a tonnage of 64,454. The number of vessels cleared outwards in 1835 was 225, with a tonnage of 53,560; in 1838 the number was 369, and the tonnage 63,392. The number of vessels belonging to the colony had increased in three years 40 per cent. In 1835 five vessels were built in the colony, with a tonnage amounting to 382, while in 1838 the number built was ten, tonnage 1267.

It also appears that the number of acres in crop had increased from 87,283 to 108,000, or nearly 24 per cent. The number of horses had increased at the rate of 49 per cent, and that of sheep from 824,256 to 1,214,485. Manufactories and trades are progressively increasing in almost every branch. In 1835 the number of mills driven by water or wind was 47; in 1838, 51; and in place of one formerly driven by steam-power, there are now two.

PASSAGE.

Van Diemen's Land is sooner reached than New South Wales (the distance from Hobart Town to Sydney being about 800 miles); on which account the charge for passage to Hobart Town is in general several pounds less than to Sydney. For a single man in the cabin, including provisions, it is about £50 to the former, and £55 to the latter; and in the steerage about £21 and £23: the difference, in short, is about £5 in the case of a cabin passenger, and from £2 to £3 in that of a steerage passenger—in both, the passage-money for a married couple is somewhat less than double. Each passenger is allowed a certain quantity of luggage freight free, generally about half a ton, although in this particular there is a considerable difference with different ships, some giving more, but a greater number less.

SUITABLE OCCUPATIONS.

We have no doubt that in time Van Diemen's Land will form a beautifully cultured and large food-producing country, perhaps as much so in proportion to its size as England. The present preventives of this desirable result are not natural but artificial. Nature has done much; man has done little. The greater part of the country is suitable for agriculture and cattle and sheep feeding. The nature of the choice between Australia and Van Diemen's Land seems to be this:—By going to Australia (almost any part of it), there is a wide scope for sheep and wool farming to capitalists: but those who engage in it have to proceed hundreds of miles into desolate wildernesses, and in a great measure bid adieu to society. Besides, the want of water is an evil of no mean character. Still, by enduring all this, money may be made. In other words, at great personal misery (to some) a fortune may be realized. In Van Diemen's Land, on the other hand, there is less scope for large sheep-farms than in Australia, and from the badness of the roads and deficiency of labourers, there is even at present little scope for agriculture. But then, Van Diemen's Land is more pleasant; it is more like what people have been accustomed to at home; labourers will by and by find their way to it; roads will surely be made some time or other; and if so, we cannot see why agriculture may not be pursued as advantageously as in Britain. Into all, the climate is unexceptionable, droughts being of comparatively rare occurrence. To persons of moderate views, and possessing a family, Van Diemen's Land is decidedly preferable. It is at all events worth remembering, that emigrants may have an opportunity of landing at and examining this colony on their way to Port Philip or Sydney, and if displeased with the prospect, they can easily find their way to a locality more suitable to their wants.

Supposing that emigrants settle here, the following is a sketch of rural operations and prospects. The greatest difficulty which the new settler will have to encounter in preparing his land, is from the trees with which he will find it encumbered. To free the land from these is an expensive, tedious, and exceedingly laborious process, but as it of course must be done, it had best be set about with cheerfulness, and kept at with unremitting perseverance. The settler must now cast his coat, and set fairly to work with his assistants. A great many settlers have contented themselves with cutting the trees a little way above the ground, leaving the stumps and roots to decay of themselves, without grubbing them out entirely, as they ought to be. This is a saving of labour and expense in the first instance, but it will not be found so in the long-run. These stumps take ten or twelve years to decay; and even in the state of decomposition to which they are then reduced, they still require to be taken up; and not having the tree to act as a lever in tearing them from the earth, they are often found more troublesome to root out than the whole tree itself would have been. While in the ground, too, they interfere sadly with the operations of both plough and harrow, deform the ridges interfere with proper draining, rendering it more expensive by making it more circuitous; and as neat and regular husbandry is always the more profitable, and as a crowd of blackened stumps sticking up in a field must entail the reverse, so must the farmer's profits be propo-

tionally lessened, to say nothing of the ungainly appearance which they must present in a cultivated field. Besides forest land, however, the emigrant may obtain abundance of open pasture-ground, upon which he may either depasture sheep and cattle, or plough it up for the growth of grain.

Oxen are commonly employed in the plough, this animal being thought safer than the horse, where many roots encumber the ground; but it is much slower, and costs more to feed than the horse does. Potatoes are eagerly cultivated in Van Diemen's Land, and it is said that they are equal to those produced in any other country in the world. They are exported in considerable quantities, along with grain, to the Australian colonies, to New Zealand, and also to Rio Janeiro, and are preferred to those grown in the above countries. In spite of the inhabitants being able to export grain, it still maintains a very high price in the island. The Hobart Town prices current states wheat to be from 10s. to 11s. per bushel; oats, 6s.; hay from £5 to £7 per ton; potatoes from £7 to £7, 10s. per ton.

The management of sheep and wool is much the same in Van Diemen's Land as in Australia, and a description of it need not here be repeated. To show the progress which this branch of industry is making in the country, it may be stated, that the amount of wool exported in 1836 was 1,983,786 lbs., and in 1837 this had increased to 2,453,610. From all we can learn, the increase of stock in Van Diemen's Land is much the same as in New South Wales, namely, 80 per cent., and the loss from deaths, &c., about 5 per cent.

Besides the growing of wool, there is another exceedingly promising source of wealth open to the settler—this is the dairy, which seems to be strangely neglected in the colony, although the demand for this species of produce is great, and the prices even extravagantly high; butter readily bringing 2s. 6d. to 3s. per pound, and colonial cheese 1s. to 1s. 3d. per pound. Yet, with all its vast extent of rich pasturage, and its innumerable flocks and herds, Van Diemen's Land imports both of these articles from New South Wales and the Cape of Good Hope. Indeed in the former country, there is more than one person who, wisely devoting themselves to this profitable branch of farm-produce, are rapidly realizing fortunes. Any person, therefore, going out with a thorough knowledge of dairy matters, would assuredly find his account in it. The cattle in Van Diemen's Land are certainly much inferior in general to what they are in this country, and therefore a similar return as to quantity could not be expected, but still that return would be amply sufficient to realize a very handsome yearly profit to the dairyman. The person going out there, or indeed any other who intends grazing cattle, would do well to take with him a quantity of English grass-seeds of various kinds, and particularly Dutch clover, which, when once settled, he should always carry about with him, sprinkling it here and there as he goes over his pasture-lands, as the sameness of the grasses in Van Diemen's Land, notwithstanding their richness, has been found pernicious to the health of the cattle. On reaching his destination, he will learn that a little salt also, placed in situations where it may be at once kept dry and be within the reach of his cattle, will be exceedingly beneficial to them.

The manner of feeding and rearing cattle is in every respect exactly the same in Van Diemen's Land as in England and Scotland, and their farming is also nearly the same, differing only in so far as a greater degree of heat in summer requires that it should. There is an idea gone abroad, that all the good land in the island is already in the possession of settlers; but this report is incorrect: there are many millions of acres of fertile country still to dispose of. Probably by much the greater part of the best situated lands, in so far as a contiguity to market or to points of embarkation is concerned, is already in the possession of private persons; but there is much valuable ground in the interior unoccupied, particularly a fine newly-discovered tract at the back of Mount Wellington, which will alone afford excellent locations to all who may seek them for some years to come.

A recent writer in the Colonial Magazine, Mr. David Burd, a settler in Van Diemen's Land, says, that the spots occupied form a mere belt along the valley of the Derwent, and that there is abundance of land in other parts which has not been even surveyed. "There is much land, too, which has been despised for its sandy surface, but a stiff clay generally lies beneath, and it is well known what trenching such ground effects. There are other spots, covered with large surface stones, almost approaching to rocks, that, from the grievous want of labour, it becomes almost impossible to convert to a fitness for agricultural purposes, although, when so converted, they have yielded a most liberal return." Land is sold in Van Diemen's Land by public auction, in lots of one square mile, or 640 acres, at an upset price of 12s. per acre.

The demand for mechanics is equally great in Van Diemen's Land as in Australia, and the encouragement the same. The description of mechanics most in demand here are coopers, ship and house carpenters, cabinet-makers, joiners, wheelwrights, brickmakers, sawyers, quarriers, stone-cutters, and masons. The wages which these receive vary from 5s. to 8s. per day, according to the ability of the workman. Living is said to be higher here than in New South Wales, but from all the information we have been able to procure, articles do not appear to be dearer in the one place than in the other. Beef sells at from 5d. to 8d. per lb.; mutton, 5½d. to 6d.; veal, 8d.; ham, 10d. to 1s.; bread, 1s. 6d. per 4 lb. loaf; oatmeal, 6d. per lb.

Farm-servants and labourers are also greatly wanted in the colony, and readily obtain employment on good terms. Shepherds and good ploughmen receive from £15 to £25 per annum, with ample provisions, providing they be trustworthy, and well acquainted with their professions. Common labourers generally receive about 1s. per day with provisions.

Both the mechanic and labourer should be informed, also, that the colonists pay as little in money to any of their workmen as they possibly can, always stipulating for a portion of their wages being taken in produce. This does not apply so much to their principal towns, such as Sydney, Hobart Town, Launceston, &c.; but in the country it is the universal practice. Money, in short, is an exceedingly scarce commodity in the colony, and its place is as far as possible supplied with the produce of the soil.

The following announcement, relative to the conveyance of free emigrants from Britain to Van Diemen's Land, has recently been issued by the Colonial Secretary:—"1. That the sum of £40 be paid towards defraying the passage of a man and his wife (and children under three years of age), provided the ages of the married couple do not exceed on embarkation thirty-five years respectively. 2. That the sum of £19 be paid towards defraying the passage of each female emigrant above eighteen years of age, and not exceeding thirty-five years, on arrival. 3. That the sum of £18 be paid towards defraying the passage of each female domestic above the age of seventeen years, and not exceeding thirty-five years, on arrival. 4. That the sum of £7 be paid for the passage of each child from three to ten years of age, and of £12 for lads between the ages of ten and eighteen, and females between ten and seventeen, respectively, for whose parents or parent the rate of fourty specified in No. 1. may be allowed. 5. That there be allowed to the master of each vessel bringing out

grants under the terms of this notice, a gratuity of 7s., to the chief mate 3s., and to the second mate 1s. 6d., for each person above one year of age, provided their conduct to such emigrants during the voyage prove satisfactory to the lieutenant-governor. 6. That parties applying for servants under the terms of this notice be required, before receiving the bounty, to enter into an engagement to maintain them for the term of the agreement hereinafter alluded to, unless parted with by mutual consent, or discharged by due course of law. 7. That persons requiring servants under the bounties thus offered, be allowed to choose their own ships; but it is recommended that regular traders to and from the ports of Hobart Town and Launceston be selected. 8. That no emigrant brought out under the foregoing regulations be engaged for a less period than three years, under a written agreement, according to a form hereafter to be published, and to date from the day that such agreement is entered into in Great Britain or Ireland. 9. That these respective bounties be allowed for emigrants of the following description only:—agricultural labourers, shepherds, masons, bricklayers, blacksmiths, wheelwrights, shipwrights, and all other descriptions of mechanics, and male and female domestic servants."

SEASONS.

The seasons of the year in these colonies being very different from what they are in this country, we beg to offer the following observations on the proper periods and mode of planting in the kitchen garden, abridged from the Appendix to the work of W. C. Wentworth. The observations apply to New South Wales in particular, but may with a reasonable allowance be also useful as regards Van Diemen's Land:—

Potatoes, for a general winter crop in field or garden, should be planted from the end of January to the end of February, or even the beginning of March, rather than lose the planting; and they will come into use in winter, when cabbage and other vegetables run to seed. The ground should, if possible, be prepared a month before the planting, and a preference given by the country gardener to new ground, or dry wheat stubble, where the soil is light. The town gardener should keep his ground in a good state by frequent light manuring. In July the ground should be prepared for the summer crop, at which time the winter crop will be fit for digging; and in this process ca e must be taken to prevent the potatoes being bruised. If possible, they should be dug in cloudy weather, to avoid exposure to the sun, which would rot them; whereas, if carefully preserved, they will keep sound for a length of time—a result the more desirable, as at this season vegetables are generally scarce and dear. The planting should take place in August, or even in September, if necessary; and at the end of the latter month, or in October, they will require to be hilled and earthed, and well cleansed from weeds, which must also now and then be done as weeds make their appearance. In the choice of seed for this crop, a middle-sized potato should be preferred, without any objection to their being cut, as is the customary mode of planting. In October you may also plant potatoes for a later crop; and this, though perhaps less abundant than that sown in August or the beginning of September, will nevertheless be sufficiently productive to pay well the expense and labour of planting. The potato is so essential and desirable an article of food, that too much care cannot be bestowed in its culture and preservation; for should other crops fall short, this will afford the grower a certain means of supporting his family.

Carrots and parsnips, for a general crop, may be be t sown in December and January. The ground should be dug deep, and broken up very fine. If the soil be light, the seed should be sown on a calm day, and trod in. Carrots and parsnips may also be planted in July, and also in November. They thrive best in an open situation, on a light sandy soil; and after they come up should be thinned and set out with a small two-inch garden hoe.

Cabbages, for a constant supply, may be sown in January, April, May, July, August, October, and early in November, at a time when the ground is in a moist state. The plants sown in April will not run to seed. Care should be taken to set out the plants in a richer and stronger ground than the bed they are taken from, otherwise the crop will be poor. Their first bed should now and then be weeded with the hand in dry weather, and the freshest and strongest plants removed first.

The ground for turnips should be prepared in February, and at the latter end of the month some may be planted, for which purpose gentle showery weather is most favourable. Turnips for a general crop should be sown early in March, and they will be ready for food for sheep in the beginning of May. During their growth they require hoeing once or twice, to thin and keep them clean, if the land be foul. Turnips for table use may be sown at any time between March and September, or the beginning of November, when absolutely necessary.

The seed of cauliflower may be sown at any time between November and February, but best in December. Some sow about the middle of May for a summer crop, and this practice is found to answer.

In March prepare the ground for onions, by breaking it up well, and richly manuring it. At the end of the month, and beginning of April, sow a light crop of onions for immediate use. In April prepare for a general crop, which should be sown at the latter end of the month, or beginning of May, to keep them from going to seed. When they grow to a proper size, which will be from the latter end of October to the beginning of November, they should be carefully laid down, so as not to break the tops; for should the tops be broken, and the wet penetrate, the onions will inevitably spoil. When fit to draw, they should be gathered on a fine dry day, and laid under cover, so as not to be at all exposed to the sun.

The ground should be prepared in March for peas and beans of all kinds, by well working and manuring; and at the end of the month, and in April, they may be sown for a spring crop. Some sow from the beginning of March till the middle of June, as occasion may require. Prepare in August for a later crop: French beans may be as well sown in October as at any other time.

In Van Diemen's Land, the farmer sows his grain in July, August, and September, which are the spring months; in October he prepares the land for Swedish turnips; in November he gets in his potato and turnip crops; December is the height of his hay harvest; at about the middle of January his wheat harvest commences, and continues through February; in March he pays attention to his fallowing and husbandry; in April he gathers his second crop of potatoes; in May he lays down his English grasses; and in June he continues his ploughing and harrowing. Thus he has a continual round of pleasurable occupation in his fields.

NEW ZEALAND

New Zealand consists mainly of two large islands, called the Middle Island and the North Island, separated by a passage called Cook's Straits, with numerous smaller isles scattered around their shores. They lie in the great southern ocean in an easterly direction from Australia, and although at a distance of about 1200 miles from that continent, may be considered as belonging to the same division of the globe The New Zea-

and islands lie between the 34th and 48th degrees of south latitude, and the 166th and 179th of east longitude. The southern or Middle Island is about 500 miles long, and from 100 to 120 broad. The northern island is the smaller, being about 400 miles long, and from 5 to 30 broad; both being estimated to contain nearly 95,000 square miles, of which two-thirds are fit for cultivation. New Zealand was first discovered in 1642 by Tasman, who, however, did not land, supposing it to form a part of the southern continent. Captain Cook first sailed round the islands, and surveyed their shores with so much accuracy, that his charts are depended upon even to the present day.

The distance of New Zealand from Great Britain is rather more than to New South Wales, or about 16,000 miles, but is reached by the same line of voyage round the Cape of Good Hope, the return being by Cape Horn. Vessels reach New Zealand from Sydney in ten or twelve days.

New Zealand is evidently of volcanic origin, there being many extinct and a few active volcanoes in the interior of the islands. According to Mr. Darwin, a naturalist who visited the islands in the ship Beagle, "the soil is volcanic; in several parts we passed over slaggy and vesicular lavas, and the form of a crater could clearly be distinguished in several of the neighbouring hills." Hot springs have also been found, some of which are described as higher than boiling heat, and some of them "of a sufficient temperature to cook any kind of native food. There is one spring of a very remarkable quality; it is to the touch as soft as oil, and, without the use of soap or any alkali except what the water itself contains, will cleanse the dirtiest garments, removing every particle of grease, however sullied they may be with it." A chain of mountains runs through the whole of the southern and a considerable part of the northern island. Some of these mountains are as high as 14,000 feet above the level of the sea, their tops being covered with perpetual snow, and their sides with forest-trees and luxuriant ferns. Besides this chain of mountains, there are other subordinate ranges, which, for the most part, are covered with vegetation to the top. From their volcanic origin, these mountains are studded with large caves; the diameter of whose openings was ascertained in some cases to be above thirty feet. The mountains are all abrupt, and highly picturesque in appearance, the perpetual snow on the tops forming a fine contrast to the agreeable climate and rich vegetation of the valleys below.

There are numbers of fine streams and rivers scattered throughout the country, which have their origin in these mountains. Several of the rivers are navigable to a considerable extent, and possess waterfalls which afford the means of establishing mills in most parts of the country. From the shape of the islands, and the mountains which intersect them, the rivers do not run to any great length, from 100 to 200 miles being the average. In 1838, the ship Pelorus entered a river in the southern island falling into Cook's Straits, and sailed up nearly forty miles, and her boats continued the navigation for twenty miles farther. The river Hokianga, in the northern island, situated almost opposite the Bay of Islands, has been navigated thirty miles by vessels of 500 tons burden. Another river, the Haritoua, which falls into Port Nicholson, is said to be navigable for nearly 100 miles. Besides these, there are numerous streams which cross and intersect the country in all directions, affording abundant means for irrigation where this is necessary.

The bays and harbours of New Zealand are not surpassed either in number or advantages by those of any country in the world. Beginning with the North Island, we have first the harbour of Wangaroa, the entrance to which is narrow, but inside the harbour is spacious and well sheltered. The Bay of Islands is about twenty-five miles south of Wangaroa, and is the harbour which has been hitherto most frequented by Europeans. The entrance to the bay is eleven miles broad, and perfectly safe, there being no bar. Inside, the bay is studded with a number of rocky islands; the water is deep close to the shore, and the anchorage is excellent. This bay has been long visited by whaling vessels for supplies, and a considerable part of the surrounding country is in the possession of Europeans. To the south of the Bay of Islands is the Frith of the Thames, which contains several well-protected harbours. The tide flows in this frith to the height of from eight to ten feet, and at all times there is plenty of water for ships of almost any tonnage. The Bay of Plenty, on the north-east coast, is formed by the island becoming much broader in a curved direction. This bay is very large, and possesses an excellent harbour called Tauranga, which is much frequented for the shipment of flax, &c. Poverty Bay is the place where Captain Cook landed, and, according to him, it affords good anchorage. Hawke's Bay is very extensive and deep, the soundings showing from six to twenty-seven fathoms water. The most important harbour in the northern island is Port Nicholson, situated in Cook's Straits. This is the port fixed upon by government as the future capital of the country, and numerous settlements are now being formed on its shores. The bay is about twelve miles long and three broad, perfectly sheltered, and ships may enter or leave with any wind. The depth of water is from seven to eleven fathoms, and the whole bay is described as of sufficient capacity to hold a navy. The river Haritoua falls into this port, the banks of which are high and well wooded. Port Nicholson has the disadvantage of being upon a lee shore, but this objection can only have weight with regard to the navigation of Cook's Straits, not to vessels lying in the port itself. On the west coast of the North Island the harbours have generally a bar at the entrance, which render their navigation more dangerous than those on the east coast. The best harbour on the west coast is that of Hokianga, which is said to run nearly thirty miles inland. It receives the river of the same name, and a number of smaller streams; and from all accounts it seems to be a valuable district for settlement. There is a bar at the entrance, with three fathoms water at low ebb; but the tide rises twelve feet, and inside the harbour deepens to seventeen fathoms. To the south of Hokianga occure the harbour of Kaipara, which is thirty miles long, and receives the waters of three considerable streams. The entrance is obstructed by two sand-banks, but between these the passage is deep, and inside the harbour is safe and commodious.

In the southern island, within Cook's Straits, is the fine harbour of Queen Charlotte's Sound, which is nearly thirty miles long. Ship Cove, within this sound, is a very fine harbour, to which European vessels have long repaired, in consequence of its having been described by Captain Cook. The harbour is perfectly sheltered, and the soundings show ten fathoms a cable's length from the shore. At the north-western extremity of this island is Cloudy Bay, which runs fifteen miles inland, and is about four miles broad. This bay is thought the best station for the black whale fishery, and, in consequence, several Europeans have already settled on its shores. Besides these two harbours, there are many others in the island, such as Lookers-on Bay, visited by Captain Cook, Port Gore, Blind Bay, Admiralty Bay, and others which have not yet been properly surveyed.

CLIMATE.

From the position of New Zealand being north and south, it presents great variety of climate considering the size of the country. All accounts agree, however, in describing it as highly salubrious, and very congenial

to European constitutions. Spring commences in the middle of August; summer in December; autumn in March; and winter in July. During winter the temperature ranges from 40° to 50° in some parts, and in others the average is higher. According to Captain Cook, while lying in Queen Charlotte's Sound, the thermometer never sunk below 48° in June, which corresponds to our December. "The trees at that time retained their verdure as if in the summer season; so that I believe their foliage is never shed till pushed by the succeeding leaves in spring." In summer the thermometer ranges from 64° to 80°, which is the highest number given. In Queen Charlotte's Sound, Captain Cook says it did not rise higher than 66°, and in the Bay of Islands, in the northern island, a thermometer kept by one of the missionaries "never rose higher than 73° or 74°, nor went below 64°." Mr. Yate, in his Account of New Zealand, speaking of the climate, says—"Those who come here sickly are soon restored to health; the healthy become robust, and the robust fat. North of the Thames snows are unknown; and frosts are off the ground by nine o'clock in the morning. The country, during six months in the year, is subject to heavy gales from the east and north-east, which generally last for three days, and are accompanied with tremendous falls of rain. These gales usually commence in the east, and gradually haul round to the north-west, where they terminate in a violent gust almost approaching to a hurricane; the clouds then pass away, and the westerly wind blows again with some violence. In the winter season the moon rarely either changes or wanes without raising one of these tempestuous gales; and during the whole year the wind is sure to blow, though it may be only for a few hours, from the east, every full and change of the moon.

"The spring and autumn are delightfully temperate, but subject to showers from the west-south-west. Indeed, however fine the summer may be, we are frequently visited by refreshing rains, which give a peculiar richness to the vegetation and fertility of the land. The prevailing winds are from the south-west and north-west, which, within this range, blow upwards of nine months in the year; more frequently the wind is due west. During five months sea-breezes set in from either coast, and meet each other half-way across the island."

Colonel Wakefield compares the climate to that of the north of Portugal; and another writer, Mr. Ward, to "that of the land lying between the south of Portugal and the north of France—pervading but without exceeding the most favoured part of the temperate region; and numerous witnesses, of ample experience, concur in describing the extremes of cold in winter, and heat in summer, as being within peculiarly narrow limits; which is to describe the climate as one of the most equable in the world." Mr. Watkins, in his examination before the Committee of the House of Lords, on being asked if the vicissitudes appeared great as compared with European climates, said—"Not any thing like our climate. The frost was there at one time a very gentle frost indeed—the ice was not entirely over a small pool of water: they told me that they saw ice sometimes in the bay the thickness of a shilling, but I did not see any near that thickness. I have slept out frequently in the bush. The fern grows in great abundance. I found myself very comfortable and warm in my great-coat and a bed of fern, rather than sleeping in the houses which are very unlike English people."

The climate of New Zealand has one great advantage over that of Australia, in not being subject to the severe droughts which so often destroy the hopes of the farmer in that country. Its insular position, and the lofty mountains which intersect the country, ensure it a constant supply of rain. This circumstance gives it a decided superiority over Australia in an agricultural point of view, rendering it more suitable for the growth of grain though we are not aware of its being greatly superior to Van Diemen's Land.

It does not appear that there are any diseases peculiar to the climate of New Zealand; all accounts agree in describing the inhabitants as a robust and healthy-looking people. Captain Cook says he never saw a single person among them who appeared to have any bodily complaint; and their wounds healed with astonishing rapidity. "A further proof that human nature is here untainted with disease, is the great number of old men we saw; many of whom, by the loss of their hair and teeth, appeared to be very ancient, yet none of them were decrepid, and though not equal to the young in muscular strength, were not a whit behind them in cheerfulness and vivacity." From their intercourse with Europeans, however, many diseases have spread among the native inhabitants; the consequence of which is, that in some parts their numbers appear to be on the decline.

SOIL AND PRODUCTIONS.—NATIVES.

The soil of New Zealand appears in almost every part to be excellent, well adapted for cultivating all sorts of grain, and indeed most European vegetables. Around the mountains the soil is volcanic, composed of pumice-stone, somewhat resembling that of some parts of Italy. In other parts it appears to be a fine stiff loam and vegetable mould, very productive. Captain Cook, describing the valleys, says—"The soil in these valleys and in the plains, of which there are many that are not overgrown with wood, is in general light but fertile; and in the opinion of Mr. Banks and Dr. Solander, as well as of every other gentleman on board, every kind of European grain, plant, and fruit, would flourish here in the utmost luxuriance. From the vegetables that we found here, there is reason to conclude that the winters are milder than those in England; and we found the summer not hotter, though it was more equally warm; so that if this country should be settled by people from Europe, they would, with a little industry, be very soon supplied, not only with the necessaries but the luxuries of life in great abundance."

The natives cultivate the potato in considerable quantities, which yields them a good crop without much trouble. There is also plenty of fine open land, consisting of alluvial soil deposited from the mountains, which would yield abundant crops of wheat, maize, barley, and other grains. In other parts, the soil consists of a deep, stiff, vegetable mould on a marly subsoil, capable of being slaked with the ashes of the fern. Mr. Yate says—"All the English grasses flourish well, but the white clover never seeds; and where the fern has been destroyed, a strong native grass, something of the nature of the Canary grass, grows in its place, and effectually prevents the fern from springing up again. Every diversity of European fruit and vegetable flourishes in New Zealand." The farms of the missionaries are perhaps the best criterion by which to judge of the capabilities of the soil of New Zealand; and from the accounts of all travellers, these appear to be particularly good. Captain Fitzroy, in his evidence before the House of Lords, says—"They are very fertile indeed. The wheat I saw there grown on the islands was as fine-looking wheat as I ever saw; and the missionaries told me it was considered better than the wheat grown in Australia, near Sydney."

The potato seems to be the only vegetable which the natives bestow much care upon in the cultivation. Of this root they have four kinds—the common potato, the white man's potato, an indigenous species, and the sweet potato. The root of the fern-tree, which is said to be almost equal to flour, furnishes them with the

principal part of their food, and this plant grows in great abundance all over the islands.

The forest-trees grow to a very great size, many of them being larger than those of America or any country in the world—a sure proof of the fertility of the soil. The largest tree is that called the *kauri*, or *cowdie*, belonging to the pine tribe. It grows in some cases to the height of eighty or ninety feet without branching, and the branches themselves may be compared to ordinary trees. The trunk is of immense girth, and the wood tough and light, being admirably adapted for ship-building or almost any other purpose. "It will scarcely be believed," says Mr. Yate, "that I have measured a kauri-tree whose circumference was forty feet eleven inches, perfectly sound throughout, the gum oozing out of it, when the bark was wounded, as though it were a plant of only a few years' growth." This gum is chewed by the natives on account of its fragrance, and a peculiar taste which it leaves on the tongue. The wood of this tree is very valuable, from its beautiful grain, smoothness durability, and the ease with which it can be wrought. "I have measured some of these trees," says Mr. M'Donnell, "upwards of thirty feet in circumference; recollect I go out of my way to do this—here are numerous single sticks, as straight as an arrow, and fit for masting any three-decker in the navy." The roots of the kauri do not sink deep into the ground, rather spreading along the surface, which is an advantage for those engaged in uprooting them from the soil. This tree is now regularly imported into this country for masting ships of war, it having been found from experiment to be stronger and more flexible than the wood of the Norway pine.

Another tree called the *totara* reaches a height of from fifty to sixty feet, and a circumference of twenty feet. Its wood is very hard, of a red colour, works easily, and from its size and strength may be applied to many useful purposes. This tree is said to resemble the yew in appearance, the foliage growing in a tuft at the top.

The *puriri* or New Zealand oak is a tree of great hardness and durability, the wood being of a dark-brown colour, and capable of taking on a beautiful polish. It has been known to remain twenty years under ground, in a wet soil, without rotting. It is, however, perforated with the holes of a worm peculiar to the tree, which prevents its being used for many purposes for which it would be otherwise very suitable.

The *farairi*, a tree of the laurel tribe, reaches the great height of from fifty to seventy feet, while its diameter is not more than three feet. It has a very beautiful appearance, and is one of the chief ornaments of the woods, but does not appear to be applied to any useful purpose. Besides these, there are many other trees in New Zealand, especially the pines, which are said to afford very superior timber for ship and house building, and also furniture-making.

The flax is another important vegetable production of New Zealand, and which is likely to form an article of considerable export. It is said to resemble the garden iris in appearance, having a green thick leaf from six to ten feet long, and growing in the greatest luxuriance throughout the country. The fibres of the leaf of this plant are used for making ropes, and many competent judges state that it is better adapted for this purpose than the European flax. From having been improperly prepared at first, a prejudice exists against the New Zealand flax. Mr. M'Donnell says regarding it—"All the standing and part of the running rigging of the Sir George Murray, a ship of 485 tons, belonging to myself, was laid up from New Zealand flax: it had been over the mast-heads for nearly three years. I can state that better rope never crossed a ship's mast-head. I have experienced some very heavy gales in the Sir George Murray, consequently the rigging had been well tried, when lifted and examined it was found (except where slightly chafed) as good as when first put over; the running rigging wore uncommonly well. Her spars, one and all, were of New Zealand pine—they were faultless. Cordage and fishing lines made from good New Zealand flax, have been proved to be far more durable than any made from European hemp."

The vegetables of Europe have been found to flourish in New Zealand; seeds which were sown by Captain Cook are said to have propagated themselves over a considerable part of the country. "Large quantities of Indian corn are now raised," says Mr. Ward, "and there is no lack of cabbages, greens, turnips, a particularly fine species of the yam, with other esculent roots. Peaches are plentiful in the season at Hokianga; figs, grapes, oranges, melons, and the Cape gooseberry, thrive uncommonly well. There are several species of the native fruits very pleasant and grateful to the taste. Strawberries and raspberries grow in abundance." A species of spinach is indigenous to the country, also a spruce-tree from which Captain Cook made beer; and a tea-tree which is said to be a good substitute for that of China.

Mr. Ward sums up his account of the vegetable productions of the country in the following words:—"New Zealand is fitted by nature for the production in abundance of those three articles which have always been regarded as the especial signs of the plenty, wealth, and luxury of a country—corn, wine, and oil. Its fertile plains adapt it to the easy cultivation of grain, for the surplus production of which it will possess a ready market, from its vicinity to New South Wales and Van Diemen's Land, where, from the high profits of wool-growing, grain from foreign countries will always find a ready demand. And the New Zealand harvests may be safely anticipated to be free from the influence of those destructive droughts which must ever be ruinous to the prospects of agriculture in Australia. The vine has been already found to thrive luxuriantly in the islands, and the possibility of its successful cultivation, both for home consumption and commerce, admits of no doubt. We have previously cited the proof of a strong resemblance to the volcanic soil of Italy in the northern island; and there is good reason to believe that the wines not only of Italy, but of Spain, Portugal, and the south of France, might be brought to as great perfection as in those countries."

The very circumstance of New Zealand being suited for the cultivation of grain, renders it unfit for ever becoming an extensive grazing country, at least for the growth of the fine wools of Australia. The following remarks from the Sydney Herald newspaper, were written by a person who had visited New Zealand on seven different occasions:—"New Zealand is fitted by nature to become the garden of New South Wales: the fertility of the soil, the excellence of the climate, and, above all, the regularity of the seasons, eminently combine to fit it for an agricultural country. But it is only as an agricultural settlement that New Zealand can flourish; as a pastoral country it can never compete with New South Wales. The experiment has again and again been tried, and the result has invariably been the same. The climate is too moist for sheep pastures: and the fine wool for which New South Wales is so remarkable speedily deteriorates in quality on the transportation of the sheep to New Zealand. The new colony consequently, can never come into any hurtful competition with New South Wales; on the contrary, the settlement of the former must be highly conducive to the advancement of the latter."

Mr. Ward gives the following suggestions for the conveyance of seeds and plants to these colonies, which may not be out of place here:—"The chief articles of food

duce to be first thought of are such as—1st, call for little labour; 2d, are not bulky for exportation; 3d, suitable for consumption in the colony; 4th, affording a quick return. Fruit-trees have the first requisite. If an emigrant takes out a few bushels of almonds (which we now import from Sicily) they will soon be bearing trees, and either the fruit or the oil is a good article of export. From a hundredweight of raisins of the sun (from the seeds of which a good vine has been known to be raised) he might sow several acres; it would be needful only to plant out the seedlings at the end of the year, and then let them stay till they had borne fruit enough to judge of; perhaps one in a hundred will be worth keeping, and the rest being rooted up, their places might be supplied with cuttings from the good sorts, and in a few years there would be a flourishing vineyard. Or from any of the wine countries, the marc might be procured in a dry state (it is for fuel they keep it), which contains all the grape stones. Of walnuts, the same may be said as of almonds. The kumera or sweet potato, which is well known in New Zealand, has been found in America to make beer exactly like malt: five bushels being equivalent to three. The olive, when once established, may be propagated quickly by cuttings, as also the fig. Plants to be transported by sea should be covered over with a glass hermetically sealed, and never uncovered till they arrive."

Little is known of the mineral productions of New Zealand, no geological survey of the islands having ever been made. Iron and coal are found in abundance, along with bitumen, freestone, marble, and sulphur. A blue pigment made use of by the natives is said to be manganese, and there is a valuable green stone found exclusively in the southern island. There is also abundance of clay fit for brick-making.

There are no native quadrupeds in New Zealand, those at present existing having been left by Captain Cook and other Europeans during their visits to the islands. Pigs are numerous, having spread very rapidly throughout the country. They are said to grow to an enormous size, and are highly valued by the natives. Dogs abound, especially about the Bay of Islands; and cats are also plentiful, and are eaten by the natives. The cattle which have been introduced by the missionaries are said to thrive well. Sheep have also been tried, and in some open parts succeeded; but New Zealand, as already stated, is more of an agricultural than a pastoral country. The only reptile yet seen in the islands is a small species of lizard.

Birds are very numerous, and are described by all travellers as beautiful songsters. Captain Cook says of them—"The ship lay at the distance of somewhat less than a quarter of a mile from the shore in Queen Charlotte's Sound, and in the morning we were awakened by the singing of the birds; the number was incredible, and they seemed to strain their throats in emulation of each other. This wild melody was infinitely superior to any that we had ever heard of the same kind; it seemed to be like small bells most exquisitely tuned; and perhaps the distance and the water between might be no small advantage to the sound. Upon inquiry we found that the birds here always began to sing about two hours after midnight, and continuing their music till sunrise, were, like our nightingales, silent the rest of the day."

Amongst the feathered tribe may be mentioned ducks, geese, woodcocks, snipes, curlews, and wood-pigeons, as affording food to man. These are very numerous, and the wood-pigeons especially are highly valued for the delicacy of their flesh. They are much larger than the pigeons of this country, and are extremely beautiful in plumage—green, purple, and gold, being the prevailing colours. Some of the birds are very remarkable. One, called by the natives the *tui*, has the power of imitating the notes of all the other birds with great exactness, and may be taught to repeat sentences or imitate the sounds of quadrupeds. Another, called the *kiwi*, is about the size of a young turkey, and its plumage resembles that of the Australian emu, being long, straight, and coarse. It has neither wings nor tail, but runs with great swiftness along the ground, and can only be caught by dogs. The natives prize it highly, and make garments of its skin.

Fish are very abundant all round the coast, and are of most excellent quality. "We have," says Mr. Yate, "a rich supply of salt-water fish; but nothing more than eels in any of the fresh-water streams or lakes in New Zealand. Those most plentiful and of greatest note are soles, mackerel, codfish, a species of salmon, whiting, snapper, mullet, beam-skate, gurnards, and a few smaller kinds, some not so large as a sprat; with an abundance of cray-fish, oysters, shrimps, prawns, mussels, and cockles. An immensely large mussel, measuring from eleven to thirteen inches, is found in great abundance at Kaipara, a harbour on the western coast, and some few of this fish are picked up in the Bay of Islands. These inhabitants of the deep form a never-failing resource for the supply of native food; but fishing is not now much regarded, except in the mackerel season, when several tribes go together to the little creeks which these fish frequent, and always succeed in capturing some hundreds of thousands before they return, the greater part of which they preserve for winter stock. They always catch these fish in the darkest nights, when they are able to see the direction the shoal takes from the phosphorescent appearance which their motion causes upon the water. They surround them with their nets, which are several hundred yards long, and drag them in vast numbers to the shore, where the contents are regularly divided among the people to whom the net belonged."

Whales frequent the coasts of New Zealand for the purpose of calving, and are caught in large numbers. This trade alone is very considerable, and would no doubt be greatly extended were settlements more numerous in the country.

The aboriginal natives of New Zealand were formerly savage and dangerous, but are now partially improved, and harmless in disposition. From all accounts, they are susceptible of much greater improvement than the natives of Australia, being ready in apprehension and tractable. They generally dwell in small villages. In their intercourse with Europeans, the New Zealanders have on all occasions manifested a desire to learn, and great aptitude in acquiring civilized customs. They are very curious to know the use of every thing they see, not being content with a mere childish admiration of it. They make excellent steersmen in ships, and one, in particular, rose to be mate of a colonial vessel. Although occasional instances of theft have been known amongst these people, yet upon the whole, their moral faculties seem to be of a high order.

The missionaries have acquired considerable influence over the natives, and have in all cases exercised it for their benefit. At their suggestion, roads have been formed, bridges erected, and ships of several hundred tons' burden built. Mr. Darwin, the naturalist to the surveying expedition of the Beagle, gives a delightful picture of a farm establishment which he visited. Fields of corn, potatoes, and clover, were seen growing, and large gardens with every fruit and vegetable which England produces. The water of a small rill on the grounds had been collected into a pool, and a flour-mill erected. "The house has been built, the windows framed, the fields ploughed, and even the trees grafted, by the New Zealander. At the mill a New Zealander may be seen powdered white with flour, like his brother miller in England."

Regarding the amount of the native population of

New Zealand, it can only be guessed at. It appears to be very small considering the extent of country—not more than five natives to three square miles. The Rev. Mr. Williams, of the Church Missionary Society, estimated the population of the northern island at 106,000. According to Mr. Polack, who allows five persons to three square miles, and taking the whole extent of both islands at 95,000 square miles, the entire population of New Zealand will be about 158,300.

HISTORY OF THE COLONIZATION OF NEW ZEALAND.

The first attempt to colonize New Zealand was made in 1825, by a company under the auspices of the Earl of Durham. Two vessels were despatched to the country by this company, and some land was acquired at Herd's Point on the Hokianga river, but the idea of settling it was soon after abandoned. The missionaries have acquired considerable tracts of land in different parts of the islands, and have introduced many farming improvements, along with the religious instruction which they have bestowed upon the natives. The Church Missionary Society has ten stations in the northern island, with fifty-four schools, and scholars amounting to 1431. There are also five Wesleyan Missionary stations, where teachers are engaged instructing the people and superintending farming operations. A company, called the New Zealand Association, was started in 1837; and another, under the name of the New Zealand Colonization Company, in 1838. These companies may be said to have merged in a New Zealand Company which was established in May, 1839, and is now engaged in carrying out plans for the settlement of the country.

When this company started into existence, the minds of many individuals of all orders were ripe for affording it encouragement; and to this circumstance, in some measure, we may attribute the remarkable success it met with. From the Colonization Company, merged in it, it inherited an extensive territory adjoining the Kaipara and Hokianga harbours in the northern island; which territory had been recently purchased by the Colonization Company, but not surveyed. While as yet the new company had formed no other connection whatever with New Zealand, but entirely upon the faith of being able to purchase land and effect settlements, it issued proposals to sell, to intending colonists, what it might be said as yet not to possess, namely, 990 sections of land in what was to be the principal settlement of the company, wherever that might be pitched, each section to consist of 100 acres of country land, and one acre of town land; 110 similar sections being reserved for the use of native settlers. Thus, the first principal settlement was to consist of 1100 sections in all, or 111,100 acres. Let the reader mark, these sections had as yet no geographical situation; the whole settlement was as yet, we might say, in the clouds. Nevertheless, within seven weeks from the issue of the proposals, purchasers had come forward for all the disposable sections, and the company had in its treasury, as the purchase-money, £99,990. Of this sum, however, they professed to have a right to only a fourth part. The remainder, £74,992, 10s., was reserved to be employed in carrying out labourers to the settlement, according to what we may call the *Wakefield plan of colonization*, already followed in South Australia. It is important to add, that priority in the choice of sections was determined by lot.

This company had to contend at its outset with one great difficulty. The British government refused to afford its plan of settlement any countenance, so that no provision for maintaining order in the new colony could be had, besides what was afforded by a gentleman who possessed an old commission as a justice of peace in New Zealand, derived from General Macquarrie, governor of New South Wales. The company, nevertheless, proceeded with their scheme, and the government soon after found it advisable to send out a lieutenant-governor of New Zealand.

The whole procedure of the company, and of those dealing with it, forms a singular and striking example of that confidence between parties which is only to be exp[illegible]ed in even its simplest forms amidst a community considerably advanced in civilization. Not only was the ground of the first settlement *paid for* before it had a cognisable existence, but, before its existence was yet known in Britain, *nine ships, containing* 1125 *emigrants*, had been despatched to it. There was first the Tory, of 382 tons, which sailed on the 5th of May, 1839, with only six emigrants, but containing Colonel Wakefield, the company's principal agent for the arrangement of settlements, and a great store of articles designed to be employed in bartering for land with the native chiefs. Colonel Wakefield, it may be remarked, had distinguished himself in the Spanish service, and is brother of the author of the well-known plan of colonization followed on this occasion. On August 1st, followed the Cuba of 373 tons, with eight first-class emigrants and twenty-two labourers, and containing also the surveying staff, under Captain W. M. Smith of the royal artillery. In the middle of September, the Oriental, Aurora, and Adelaide, respectively of 506, 550, and 640 tons, proceeded on the same voyage, with a large body of emigrants of both classes. All of these were from London. On October 5th, the Duke of Roxburghe sailed from Plymouth with 167 settlers. Three other vessels, one of which was from Glasgow, and two from London, sailed before the end of the year. Besides these, there were three ships containing stores, designed to guard against the possibility of any deficiency of necessaries being felt during the early days of the settlement.

The voyage of the Tory was prosperous, and uncommonly quick. In ninety-six days from Plymouth, namely, on the 16th of August, she hove in sight of Cape Farewell, the northern point of the southern island, and which forms one side of the opening, named Cook's Straits, between the two islands. She lost no time in standing through the straits, and on the 18th she anchored in Ship Cove, as nearly as possible in the same spot that Captain Cook occupied in his three visits to the island. Colonel Wakefield, in his journal, describes the southern island as forbidding in its appearance at a distance—"a succession of apparently barren mountains stretching away from the coast till they reach those covered with snow in the interior." But, "on nearing the land, you find that the whole is covered to the very highest points with timber and brushwood, which not till then betray their perpetual verdure." Ship Cove, in the northern island, was a beautiful place. "The water, tranquil as an inland lake, has ten fathoms' depth within a ship's length of the shore, which is covered to the water's edge with an evergreen forest, consisting of every variety of indigenous tree and shrub, so thick as to be scarcely penetrable, and presenting to the eye an undulating carpet of verdure reaching to the summit of the surrounding mountains, the highest of which is from 1200 to 1500 feet. The birds, as in the time of the immortal English navigator, fill the air with their notes, the mingling of which he has aptly likened to the tinkling of small bells; and the sea teems with fish, of which we caught enough with hooks and lines for the whole ship before we dropped anchor. These consisted of hauk, cole-fish, spotted dog-fish, gurnet, flounder, and joe-fish, all of which are eatable."

Colonel Wakefield found no difficulty in communicating with the native chiefs; but it was not so easy to acquire lands, not owing to any disinclination of the natives to sell them at a moderate price, but because it was difficult to ascertain who were the proper owners, or the owners who could convey a sound title. The general feeling of the natives is in favour of British sub-

Jements. They have tasted the benefits of civilization sufficiently, to be very anxious for increased intercourse with the English, and for this reason they appeared to Colonel Wakefield as if they would have willingly allowed the soil to be appropriated to a large extent, without looking for any remuneration. But the company was anxious that a reasonable, and, considering the circumstances, a liberal price, should be given for lands; and the main difficulty, as just stated, was to discover the parties who were entitled to part with the soil. An immense quantity of land had already been appropriated by private persons or by the missionary societies, without much ceremony.

Colonel Wakefield sent home a journal brought down to the 2d of September, and not long after he despatched another section of it, containing not less interesting intelligence. The second section of his journal commences on the 6th of September with a description of the trade carried on in Queen Charlotte's Sound and other bays connected with Cook's Straits. He describes whalers in the pay of Sydney capitalists as being the chief followers of this hazardous but profitable commerce. It is estimated that the whale-fishery produces 1200 tons of oil per annum, and that the number of British who compose "shore-parties" in Cook's Straits and the stations on Banks's Peninsula, are about 500. They are a lawless set of people, quarrelling with the natives and among themselves. There are, however, some respectable persons among them.

Learning that the church missionaries were endeavouring to frustrate their views respecting Port Nicholson, a fine harbour and country in the northern island, about the centre of Cook's Straits, Colonel Wakefield now made haste thither. He met with a very hearty reception from the chiefs. "Epuri, an old chief, eagerly inquired the motives of our visit, and betrayed the most lively satisfaction at being informed that we wished to buy the place, and bring white men to it. He was followed by Wareporl, his nephew, who is about thirty-five years old, and has for some years superseded the older chiefs in influence, by his prowess in war, and skill in the rude arts cultivated by these people." Colonel Wakefield ascended the principal river which falls into the bay, and was well satisfied with the capabilities of the district. The soil is a rich black loam; the timber excellent in quality and of various descriptions; and the navigation of the river, which was obstructed by heaps of stones and trees thrown across, susceptible of great improvement at slight expense.

Colonel Wakefield determined to fix upon this part of the island for the first and principal settlement of the company; and he lost no time in coming to terms with the natives. He thus describes his purchase:—

"I found a territory of forty or fifty miles in length by twenty-five or thirty in breadth, containing a noble harbour, accessible at all times, and in the very highway between New Holland and the Western world, and land exceeding in fertility any I have seen in these islands, and equalling that of an English garden. I found a race of people of warlike habits, and but little used to intercourse with Europeans, just emerging from their barbarism, and inclined to cultivate the arts and intimacy with Great Britain; appreciating the protection from their hostile and still savage enemies that British settlers would afford, and anxiously desiring to assist them in their first efforts in a new country. Under these circumstances, without swerving out the spirit of my instructions, I determined to act in the most liberal manner in the transaction. Moreover, I was most anxious to distinguish this bargain from all others that have been made in New Zealand, and to put none of the haggling and petty trading which usually takes place between Europeans and the natives of this country, should enter into any operations between the natives and the company's agents; and that the value of this property should not be regulated by what has hitherto been considered the standard of exchange in similar transactions."

The amount paid, of course, is not published; but the natives were highly pleased with their bargain, and eager to sell more of their land. The chiefs carefully examined the articles given in barter, and then signed a formal deed, alienating the land for ever. The war-dance, the hoisting of the New Zealand flag, and the formal ceremony of taking possession of the territory, are vividly described. Colonel Wakefield left a person in charge of his newly-acquired territory.

This important business being settled, the Tory proceeded along the coast of the northern island towards the north, and on the 16th October came to an anchor off Kapiti, near Evans's Island. A smart battle had just then taken place between the two chief tribes in those parts, the Ngatirocowas, and Ngatiawas, the latter of whom, a comparatively civilized and pacific race, had acted on the defensive, and been victorious. Colonel Wakefield had some intercourse with Raupero, a corrupt chief of the Kafia tribe, who had aided and instigated the Ngatirocowas, and with Hiho, an amiable young chief of the Ngatiawas; and after some deliberations, and one somewhat wild scene, purchased the extensive tracts of land on both sides of Cook's Straits, forming "the commanding portions of the two islands." The goods given in exchange were upon the same liberal scale as in the case of Port Nicholson, and ultimately all the natives expressed themselves as quite satisfied. With regard to some portions of the ground purchased, it was known that there were other tribes, now dispossessed, who had claims upon them; but from these parties Colonel Wakefield apprehended no trouble of any consequence. In all cases he took care to have deeds of cession formally executed on the spot—a precaution the more necessary, as already speculators were sending emissaries from Sydney to buy up land in New Zealand, on a supposition of its soon acquiring a marketable value. For the next two or three weeks, Colonel Wakefield employed himself in sailing to different points in Cook's Straits, in order to buy up the claims of as many parties as possible. In concluding his survey of both sides of these straits, he gives a table of the native population of the principal districts, which he estimates as amounting in all to 6650.

Colonel Wakefield now proceeded to Hokianga, a deep inlet near the farther extremity of the northern island, leaving Mr. Barrett, a whaling merchant, to arrange with the natives for the purchase of the lands more immediately to the north of Cook's Straits. He reached Hokianga on the 2d December, and entered into negotiations for the purchase of lands there and in the Bay of Islands, on the opposite or east side of the country. The natives are not here so fine a people, physically or morally, as in the south, and not so ready to sell their lands. Colonel Wakefield obtained possession of a tract at Herd's Point, being the land purchased by Captain Herd, in 1826, for the old company —reserved by the natives since that time—and now scrupulously made over to their successors. This done, he left Hokianga on the 13th December for Kaipara, another important inlet, a little farther to the south. At this point, he completed his third despatch.

According to subsequent despatches, the Tory struck upon a (supposed) newly-formed sand-bank in going into Kaipara bay or harbour, and, though got off in twenty-four hours, sustained such damage that Colonel Wakefield judged it prudent to leave her for repairs, and proceed with his land-buying operations. Having therefore secured all important papers, he walked across the continent to the Bay of Islands, and there chartered a small brig to go to Kaipara, to take charge of the cargo and passengers. He likewise engaged another small

vessel to take him to Port Hardy in D'Urville's Island (Cook's Straits), the place of rendezvous for the emigrant ships. He reached Port Hardy on the 11th January; but finding none of the emigrant vessels arrived, he judged it best to cross the straits to Port Nicholson, which he did in a whale boat, leaving an Englishman to direct these vessels to follow him thither. Port Nicholson was the place of all others which he thought suitable for the first settlement, and he was now anxious to prepare matters as far as possible for the arrival of the settlers. These now began to arrive in the successive vessels, of which all that had been despatched in 1839 arrived before March 7, 1840.

Meanwhile the government had deemed it necessary to take some step regarding the colonization of New Zealand. In August, 1839, it despatched Captain Hobson, R. N., as Lieutenant-Governor of New Zealand. He arrived at the Bay of Islands on the 30th of January, and on that day issued a proclamation, intimating that the queen did not deem it expedient for the interests either of her British subjects resorting to New Zealand, or for those of the native tribes, to recognise as valid any titles to land not derived from or confirmed by her majesty; but yet, "to dispel any apprehension that it was designed to dispossess the owners of land acquired on equitable conditions, and not in extent or otherwise prejudicial to the present or prospective interests of the community," declaring "that her majesty had been pleased to direct that a commission should be appointed, with certain powers to be derived from a governor and Legislative Council of New South Wales, to inquire into and to report on all claims to such lands;" and further intimating that "purchases of land in any part of New Zealand which may be made from any of the chiefs or native tribes after the date of these presents [January 30, 1840], will be considered as null and void, and will not be confirmed, or in any way recognised, by her majesty."

In terms of this proclamation, it will be necessary for all who have purchased land in New Zealand to prove their rights before the commission. Captain Hobson left the Bay of Islands on the 17th February, declaring it an unfit place to be the seat of government for New Zealand, being distant from the more fertile parts of the country, and cut off from all easy communication with the southward. He had previously had some conferences with the native chiefs relative to the acquisitions of land by the missionaries. A paralytic shock brought his measures to an abrupt conclusion, which, however, was only temporary, as he soon so far recovered as to resume his functions.

Other companies besides that represented by Colonel Wakefield have in the mean time been taking steps for promoting the colonization of New Zealand. One of these, the *Plymouth Company of New Zealand*, advertised on the 18th July that it had secured an extensive purchase of land, and had sent out orders for the selection of a settlement. A thousand sections of town and rural land were in the way of being engaged, on the understanding that, out of the £70 of purchase-money of each section, £40 was to be expended in carrying out labourers. The *New Zealand Manakou and Waitemata Company* acquired valuable tracts on those harbours (in the northern island) in 1838, and sent out a clever young officer, Captain W. C. Symonds, H. M. S., to survey the same and report, before taking any further step. A report from Captain Symonds, dated in February, 1840, and of a highly favourable nature, was received in July, and the company then proceeded to receive applications for 200 sections, of 1 town-acre and 100 country acres each, at £101 each, 65 per cent. of the purchase-money to be expended in taking out labourers. In July, 1840, the *Paisley New Zealand Emigration Society* was formed in connection with the London Company, for the purpose of promoting an extensive emigration of hand-loom weavers from the west of Scotland to New Zealand.

While these proceedings were going on on the part of the British, a French expedition sailed for the same country, designing to appropriate land for a settlement, but chiefly to all appearance with a view to the whale fishery. Disputes between France and England respecting the sovereignty of New Zealand, have been foreboded; but we have no fear that any thing of the kind, to an extent at all troublesome, will take place.

The following has been issued by the colonial secretary, respecting the plan of government to be adopted in New Zealand:—

The colony is to be entirely separate from and independent of New South Wales. A local legislature, to be composed for the present of the chief officers of the local government, and some of the chief inhabitants, is to be constituted, to make laws for the peace, order, and good government of the colony.

With respect to all lands acquired in the colony under any other than that of grants made in the name and on behalf of her majesty, it is proposed that the titles of the claimants should be subjected to the investigation of a commission to be constituted for the purpose. The basis of that inquiry will be the assertion on the part of the crown of a title to all lands situate in New Zealand, which have heretofore been granted by the chiefs of those islands according to the customs of the country, and in return for some adequate consideration.

An account of all the just and moderate expenses of the company hitherto incurred in forwarding the colonization of New Zealand to be made out, and the crown to grant the company as many acres of land as shall be equal to four times the number of pounds sterling which they shall be found to have expended in the manner stated. The lands to be taken by the company in the neighbourhood of their respective settlements at Port Nicholson and New Plymouth.

The company to forego all claim to any lands purchased or acquired by them in New Zealand, other than the lands so to be granted to them, and other than such lands which they may hereafter acquire from the crown or other persons deriving their title from the crown.

It is proposed to apply to all other British subjects the rule to which the New Zealand Company will be subject in respect of the lands claimed by them within the colony. This advantage, however, will be offered only to those whose lands were acquired before the 5th day of January, 1840, the date of proclamation issued by Sir George Gipps on the subject.

The governor of New Zealand will be instructed to recommend to the local legislature the enactment of a law to incorporate, as a municipal body, settlers who have, at the charge of the company, resorted to Port Nicholson, and settled themselves there or in that vicinity. For the present, her majesty's government engage that all sums of money which shall be paid by the company for the purchase of land in New Zealand, shall, whatever such money shall be paid in this country, be laid out in the removal of emigrants to New Zealand, it being left to the company, from time to time, to determine whether such money shall be so laid out by the Commissioners of Colonial Lands and Emigration or by the company themselves, under the superintendence and with the concurrence and sanction of those commissioners. The native reserves made by the company to be sanctioned by the crown.

A charter to be granted for forty years, but to contain provisions enabling the crown to resume the charter and purchase the lands and other property of the company on just and equitable terms, in case the public interest should require such resumption and purchase.

A township has been marked out on the shores of Port Nicholson, and named Wellington, which is

thought will be the capital of the colony. It is also proposed to build a town at the harbour of Hokianga, to be called Churchill; another at the Bay of Islands, to be called Russell; and a fourth at the Frith of Thames, to be called Auckland.

Up till the period we write (April, 1841), so little information of a substantial nature has been made known respecting the settlement of New Zealand, that we are unable to say distinctly how the colony is advancing, though, from floating intelligence, there is the greatest prospect of success; ships with emigrants, both capitalists and labourers, and also large stocks of provision and merchandise, are regularly sailing, and the country must soon present the spectacle of general industry and comfort.

SUBJECT OF EMIGRATION CONCLUDED.

In the present and preceding three sheets, we have presented, to the best of our ability, a practical view of the subject of emigration to Canada and other British American possessions, to the United States of America, to the different colonies on the mainland of Australia, and to Van Diemen's Land and New Zealand. These do not comprehend all the fields for emigration, but they are the principal, and those which seem most commonly available. The places of which we have not formally treated, are the Cape of Good Hope, the British West Indies, and Ceylon, all of which are crown colonies, and open to settlers. Ceylon, being situated within a few degrees of the line, and altogether tropical in character, is not to be mentioned as suitable for British emigrants; and the same thing may almost be said of the West Indies. The Cape of Good Hope, consisting of a large portion of South Africa, from all we can understand, is now in a thriving condition, and to many it forms a tempting field of settlement. The climate is agreeable, the government is settled and liberal in character, and there are large tracts of land open to settlers on easy terms. Farms abandoned by Dutch proprietors who have emigrated to more remote districts, can always be obtained at a cheap price; and as respects pastoral qualities, the territory is equal, if not superior, to many portions of Australia. As, however, we have no official papers on the subject before us, we pass to a general consideration of those fields of emigration which have been separately described.

The readers of these sheets will have observed, that each country or district referred to possesses a certain peculiarity of character, or, as we may say, has good and bad points in a greater or lesser ratio, which it will behove the intending emigrant to consider.

Canada possesses a most fertile soil, but it has very indifferent roads, is slow in improving, and labours under the drawback of a long and extremely cold winter. It seems best adapted for small capitalists who wish to pursue agricultural pursuits, or field labourers and artisans of a common kind. It has also the great advantage of being speedily and cheaply reached; yet, to a person with a few pounds to spare, such an advantage should go for nothing. In taking the step of emigration, it is of importance that it should be done well, and once for all.

The United States offer a far more agreeable scene for agricultural labour, because, while the soil is equally fertile with that of Canada, the winters are shorter. Some of the fine prairie-lands of the western states possess attractions which cannot be surpassed. As it is easy to reach these districts from Canada, many spirited emigrants will push on thither if they find such a step advisable. The United States possess a prodigious superiority over Canada in one particular—the sale of lands. In Canada, the abominable plan of selling lands by suction to the highest bidder, at periodic intervals, still continues, and, by disheartening emigrants and wearing out their means, sends shoals onwards to the states, where the land pitched upon has its exact price, and a purchase can be at once effected. If emigrants to Canada, therefore, cannot buy half-cleared lots on the instant, which perhaps they will find no difficulty in doing, we recommend them to proceed immediately into Michigan, Illinois, or some other western state of the Union. They will find so many persons on the road, that the exact route need not here be defined. Were the British government to institute a plan of colonising Canada, on a great scale, with an humble order of settlers, and at the same time permit the free importation of corn from that part of the empire, we might expect to find the country in a state of rapid progression in a very short period of time; but neither of these arrangements is at present likely to be carried into effect. It is proper to mention, that although the United States possess that degree of civil and religious liberty, which leaves nothing to be wished for on that score, the country labours under a universal derangement in money matters, and we fear that the settler must lay his account with a clumsy and unprofitable system of barter in relation to most products of his industry.

Australia is much better adapted for the emigration of capitalists than any part of America. We never hear of any one making a fortune in either Canada or the United States, but many in New South Wales. It would almost appear that, whatever be the sum of money a man expends on land in America, he seldom rises above the condition of a drudge—a circumstance arising from two causes, lack of cheap labour and lack of outlet for produce. Provided a course of industry and sobriety be pursued, he will unquestionably attain a state of competency and tranquillity, and will see his family rising around him with the prospects of respectable settlement, but we fear that, unless some great change take place in Canadian affairs, he stands a slender chance of ever getting above the condition of a small farmer; consequently there is no temptation for persons of comparative wealth to encounter the early and annoying difficulties of settlement in that rude country. In Australia, the emigrant will also experience personal discomfort and deterioration of habits. But a time comes when he can sit down with a degree of ease, calmly reposing on the advantages he has earned—he can reasonably look forward to indulgence in refinements such as wealth purchases in Britain; and with this pleasing hope, any species of immediate toil is of trifling consideration. Besides, to the person who loves a fine climate, where on earth could a more delightful country be found than Australia? Cold seldom or never sinks to that pitch which produces snow, and the heat, also, is by no means extreme. As respects climate and natural products, we should consider some parts of New South Wales equal to Asia Minor and adjacent countries; and that British subjects are at liberty to proceed to such an agreeable field of industry, and there possess all the privileges which our laws and constitution bestow, may be held to be a boon of which we cannot be too thankful. There is one material drawback to Australia—the want of regular and frequent rains. This leads occasionally to extreme droughts, which parch the ground, and in many parts render the business of the agriculturist very precarious. On that account Australia is better fitted for pasturage than agriculture. Van Diemen's Land, and also New Zealand, on the other hand, seem to be more agricultural than pastoral. Grain and flax, two grand staples in human affairs, will most likely become the permanent products of these fertile islands. In point of national economy, it is of no consequence what a country produces, provided it produce something which can be sold in the general market of the world. Let the mainland of Australia, therefore, attain prosperity by its wool, and perhaps its wines and fine fruits, and let Van Diemen's

Land and New Zealand grow in wealth from their grain, flax, timber, and perhaps their whale-fisheries. In both New South Wales and Van Diemen's Land, the sales of land are by auction, as in Canada—an evil of serious consequence, from which the Port Phillip district and South Australia are fortunately exempt.

It is gratifying to reflect, that every year settlement in any of the colonies is becoming less precarious, and promises a higher measure of success. Those who have gone before, instead of absorbing all that is good, are only preparers of the way for others. There is not the least chance of any one going too late, go when he will. There is ample room for all. The more who go, indeed, the greater is the likelihood of general prosperity. The fundamental evil, a lack of labourers, is daily lessening by the free and purchased passages of the young and industrious classes, and in proportion as this stream of emigration is sustained, so may we expect the various fields of emigration to be more suitable for the resort of capital and intelligent enterprise.

DESCRIPTION OF THE UNITED STATES.

HISTORICAL NOTICE.

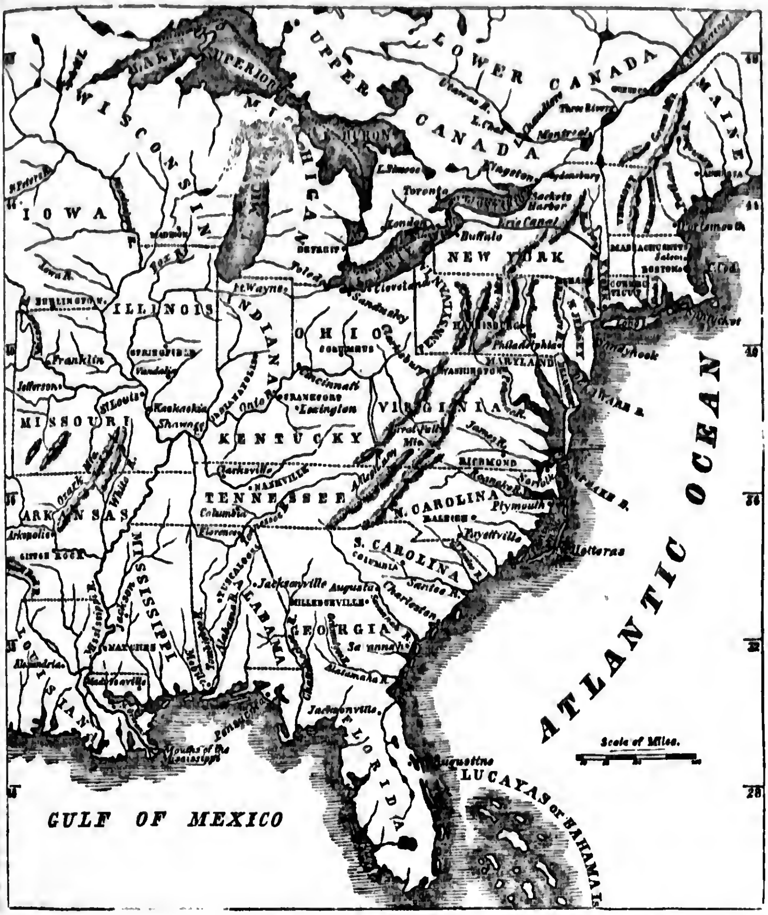
The continent of America, with all its islands, and the people who originally inhabited them, were unknown to the inhabitants of Europe till the end of the fifteenth century. They were discovered in the year 1492 by Christopher Columbus, while in search of a route by sea to the East Indies; and when he first saw them, he believed that they were part of China, or Japan; so little idea had the Europeans of those days of the existence of the vast countries which have since exercised so powerful an influence on the fate of their descendants.

The rude state of the native inhabitants, and the superior military knowledge of the Europeans, which they used with very little regard to right, enabled them soon to seize on all such parts of the country as they preferred, and to drive away, or reduce to subjection, the original possessors. In this way the southern part of the continent was subjugated, and partly colonized, by the Spaniards and Portuguese; while the northern portions fell into the hands of the other maritime nations of Europe—the English, French, Dutch, and Swedes—who formed colonies at different points along the coast. The whole of these, however, soon fell into the possession of the English and French alone. Under these two powers, the American colonies continued to afford a refuge to people of the European countries who considered themselves oppressed or aggrieved at home. During the seventeenth century, when extensive emigration first began to take place, it was not so much the want of employment, or of subsistence, which induced men to seek for a change of residence, as the wish of escaping from persecution on account of religion, or from the civil wars of the time. This was the case particularly in England, during that period when religious and political animosities greatly disturbed the country. Troubles of other kinds, and latterly the necessities of an overcrowded population, continued to afford a motive for the people resorting to America: and during great part of the eighteenth century, it is reckoned that from 5000 to 3000 persons yearly removed to these countries from Europe.

Some disputes arose, about 1755, between the French and English, who were now the sole possessors of North America; these at last led to a war, which terminated in the total destruction of the French power in that country, and in the transference to the English of all their colonies there, except some thinly peopled regions on the Mississippi. This result took place in 1763; but though it gave to Britain a large addition of new territory, and relieved her old possessions from an enemy, it left her burdened with large debts. In order to avoid unpopularity at home, the ministry of the day projected the scheme of throwing part of the burden of these upon the colonies; alleging as a reason, that the war had been undertaken for their benefit, and in order to deliver them from an enemy who continually hung on their frontiers. The first tax proposed for this purpose was a stamp-duty (1765); but the colonies firmly refused to submit to it, saying that they were perfectly willing to pay the expense of their own governments, but that they would not endure to be taxed by a foreign body like the British Parliament, which was situated at the distance of 3000 miles, and in whose deliberations they had no voice, while it might employ the money obtained from them for purposes hostile to their own freedom or welfare. This feeling was universal among the people of the colonies; for these being generally the descendants of men who had left Europe in disgust at some real or fancied oppression, had not those habits of deference to the commands of persons in high station, which often tend to secure obedience and quiet in other countries.

In consequence of this determination on the part of the colonies, and of the obstinacy of the English ministry in adhering to their demands, a great many irritating occurrences took place. The Americans refused to import or to use British manufactures; riots took place in almost all the towns, but chiefly in Boston; and the taxed articles which were sent out were destroyed. A meeting of delegates from the several colonies or districts was held in 1765, to petition and remonstrate against what they considered an injustice. Still the British government persevered. And though there was at one time an apparent disposition to recede from some of the propositions which had caused most irritation, the right of taxing the colonies was vigorously maintained. New taxes were soon after imposed (1767) on tea, glass, and paints. The pertinacity of both parties led to frequent violence, and at length to actual demonstrations of war on the part of the Americans. This war lasted for about seven years, from 1775 to 1782, and concluded at last, as might have been anticipated, by the British being compelled to relinquish a country of which every inhabitant was their enemy. The war was conducted on the part of the Americans by General George Washington, to whose talents and perseverance its speedy termination was greatly owing, and whose moderation in using the influence which success had given him over his countrymen, has been too seldom imitated by conquerors. The councils of the Americans, and the negotiations with other powers, were mainly directed during these transactions by Benjamin Franklin, a man who was equally distinguished as a philosopher and a lover of his country.

At the conclusion of peace between Great Britain and America, the following thirteen states formed the republic of the United States:—New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia. To these have been added, from time to time, Maine, Vermont, Columbia, Alabama, Louisiana (purchased from the French in 1803), Ohio, Michigan, Indiana, Illinois, Missouri, Kentucky, Tennessee, and Mississippi. Besides these, may be mentioned the territories of Florida, Wisconsin, and Iowa, which are governed by officers appointed by the American government.



FORM [illegible]

Each of the [illegible] settled in America, had ha[illegible] assigned it for maintaining the [illegible]. This consisted generally of a house of [illegible] chosen by the people, with governor, judges, and other officers, appointed by the king, but paid out of taxes levied by the representatives. On acquiring independence after their war with the mother country, the different colonies, now called states, made such alterations, each in its own constitution, as they believed to be suited to their circumstances; and a general government, framed and appointed by the consent of the whole, was formed to take charge of such national affairs as the states could not manage separately. The states have each a senate and house of representatives; the members of the former are fewer in number than those of the latter, and a part of them only is chosen at each election, so that they remain in office for several years, generally four: the house of representatives is elected anew every year. The resolutions agreed to by these two bodies for the government of the state, are afterwards submitted to a president or governor, whose sanction constitutes them part of the law. Both senators and representatives are paid for their attendance on the public business, generally at the rate of two dollars (or nine shillings sterling) per day, besides an allowance for travelling expenses. The right of election resides in the people under certain limitations: in some states the possession of a certain property (about £50) is required in the electors: in others, the regular payment of certain taxes: in all, a residence in the state, varying from two years to six months, is requisite. But there are only eight of the states in which black people

are allowed to give votes. The judges and other magistrates are in some states elected by the people; in others, by the governor, subject to the approval of the two houses: and their tenure of office is in some for a term of years; in others, during good behaviour; and in several, till the holder attain a certain age (about 70).

The general government of the United States is, like that of the states individually, a representative democracy, in which the people intrust the administration of affairs to executive and legislative officers of their own choice. At the head of the executive is a President, who, with a Vice-President, is elected every four years, and must be a native-born citizen of the States. The legislative body consists of two houses—the Senate and House of Representatives. The members of both houses receive 36s. per day, with travelling expenses. The Senate consists of forty-eight members, two from each state; sixteen of these are elected every two years, so that the whole may be renewed in six years. The members are required to be at least thirty years of age, to have lived nine years in the United States, and to be at the time of election residents in the state by which they are returned. The Senate exercises most of the functions of the British House of Lords. The House of Representatives is chosen annually, and the members are required to be at least twenty-four years of age, to have resided three or four years in the state for which they are chosen, and, in one or two of the districts, to possess a certain property. There is one representative nearly for every 40,000 persons, five black men being reckoned in this enumeration equal to three white. The House of Representatives perform the duties allotted by the British constitution to the Commons' House of Parliament, and have the right, like them, of originating all bills for raising revenue; while the Senate, on the other hand, like our House of Lords, is intrusted with the exclusive power of impeaching any officer of state for public misdemeanor. Bills which have passed the two houses have not the sanction of law till they are signed by the President, or, on his refusal, are voted a second time by two-thirds of each of the houses. The President, Senate, and House of Representatives, are called the Congress of the United States, and their powers in making regulations concerning the public affairs are defined and limited by the original articles of the Constitution. Congress is prohibited by these from making any law concerning the establishment or free exercise of religion, the liberty of the press, and freedom of speech, or the privilege of public meetings to express their opinions peaceably on the measures of government. The people are secured in the right of bearing arms, of fair trial, and in the possession of their property, against all aggressors, either public or private. Of these rights, no act of Congress, or other authority, can deprive them; and if they are invaded, the sufferer can have redress by applying to the courts of justice.

The judicial power is vested in one supreme court, and in such inferior courts as Congress may from time to time establish. The present judicial establishment consists of a supreme court, thirty-one district courts, and seven circuit courts. The Supreme Court consists of a chief-justice and six associate justices, who hold a court in the city of Washington annually; besides which, each judge attends in certain districts to hold circuit courts with the local justices. The processes of law are in general simple and direct, and are not made difficult of access to the poor by any burdensome expenses.

According to the Constitution, all men are equal, none possessing any hereditary rank over the other; but this universal and broadly defined principle of democracy is impaired by the circumstance of there being upwards of two millions of blacks forcibly detained in the condition of slaves, besides upwards of 300,000 of a free coloured population, who are shunned as an inferior race, and denied various social advantages; in point of fact, the whites form an aristocracy in all parts of the states. The constitution is further defective in practice, by being evidently incapable of restraining popular violence; for it is an incontestible fact, that mobs frequently defeat the operation of the law, when distasteful to their feelings, and commit flagrant acts of severity upon individuals. Perhaps a better state of education may remedy this great grievance; meanwhile, it is too important a feature in the political condition of the people, to be passed over in silence. Generally speaking, it may be said that popular opinion is the absolute governing power in the States, and cannot be withstood by any species of opposition. Popular opinion, whether right or wrong, enforces uniformity in external behaviour and profession of belief, to a degree which would be called despotic if exercised in a monarchical country. On this account, the maintenance of opinions with respect to politics and religion is practically less free in America than in England, where, if a man pay all demands upon him, and commit no overt act of sedition or other gross impropriety, he may profess what opinions he pleases, and live any way that suits his fancy.

The expense at which the entire government of the States is conducted, including the military and naval departments, is on a singularly economical scale. The President receives of annual salary £5625, the Vice-President £1125, and the Secretary of State the same. Each of seven ambassadors is paid £2025. In 1837, the general expenses were summed up as follow:—

Civil list, foreign intercourse, and miscellaneous,	$5,521,[illegible]
Military service, including fortifications, Indian affairs, militia, improvements of harbours and rivers; constructing roads and building arsenals, &c.,	19,417,[illegible]
Naval service, including expeditions, &c.,	6,52[illegible]
Public debt,	21,[illegible]
Total expenses of general government,	$31,515,[illegible]

The annual charge of the public debt is to be deducted from the above sum, as the whole has now been very nearly discharged. But in estimating the whole cost of the government, it is necessary also to take into account the sums required for the expenses of the different states. We do not find any direct notice of the amount of these, but as Captain Hall states that each person pays to the state government 3s., and to the general government about 9s. 4½d. per annum, this proportion would make the amount of the expenses of the different states about £2,087,029; and the whole cost of government is therefore £7,722,009, amounting, according to Captain Hall's estimate, to about 12s. 4½d. for each person. The national debt having been now nearly paid off, the yearly sum paid in taxes, by each person, may be estimated at 8s. The only taxes are those on articles imported from foreign places, none whatever being levied on the manufactures or produce of the country itself; and there are no direct taxes, like the house or window taxes in this country. Part of the revenue is derived from the sale of public lands; and this amounted in 1828 to £290,821.

ARMY AND NAVY.

The regular army of the United States amounts upwards of twelve thousand men: it consists of 7[illegible] commissioned officers, and 11,804 non-commissioned officers and privates; in all, 12,539 men. The militia is estimated at 1,350,805 men. In this body the men require a certain knowledge of military exercises, but admit very little to subordination.

There is a military academy for educating young men as officers; the number under tuition is limited to [illegible], and the instruction given is well fitted for training the minds to knowledge and gentlemanly feelings: the course consists of natural and experimental philosophy, mathematics, engineering, ethics, drawing, and the use

military exercises. The young men educated here are received into the army as cadets, and their promotion is afterwards regulated strictly by seniority, except in extraordinary cases.

The navy consists of 8 ships of the line, and 3 others building; 10 frigates of 44 guns, 2 of 36 guns, and 5 building; 29 sloops of war and smaller vessels, and 1 armed steamship. The number of captains is 55; commanders 54; and lieutenants 285. There are seven navy-yards, of which the principal are on Long Island, near New York, at Philadelphia, and at Washington. Recent events may have caused an alteration in this summary of the military and naval force.

Notwithstanding the free genius of the American constitution, and the little attention paid to wealth or difference of rank in common life, discipline is enforced with great strictness in the naval service, and with the more jealousy, perhaps, because there is always a danger of the seamen and inferior officers falling into the independent habits of their countrymen, which would be inconsistent with the authority of a commander at sea. Captain Hall tells a story of a young officer who announced his intention of appealing to the people on having been reprimanded by his captain. This being reported at head-quarters, an order came down to say, that the officer was perfectly at liberty to appeal as he proposed; and in order that he might do so without inconvenience, his discharge from the navy was enclosed. Great care is taken in the selection of persons wishing to enter the naval service; and these gentlemen are also exposed, afterwards, to frequent and rigorous examinations, by which means incompetent persons are excluded.

The ships of the American navy are generally well built, and good sailers: they are constructed in great part of a wood called the *live oak*, or *evergreen oak*, which grows in the salt marshes of Florida, and which is almost incorruptible. Large plantations of this valuable tree are formed, and carefully attended to by the government, the only instance in which forest trees are at all cared for in America.

MANUFACTURES.

The vast extent of culturable and prolific land in the United States, and the constant demand for large supplies for food, forms a reason why the nation should resort more to agricultural than manufacturing industry as a staple employment. The Americans, nevertheless, from a strong desire to be independent of foreign countries for a supply of articles of clothing, have thrown themselves energetically into a course of manufacturing, in relation both to soft and hard goods. Doubtless, they could be supplied with the articles cheaper from England than they could make them; but this seems a matter of indifference, and as the English think fit to exclude American grain from their market, the Americans in return exclude English goods. At present, they are engaged in a kind of rivalry with Britain, and it is certain that they are fast overtaking it, both in the excellence and cheapness of their products.

The manufactures which are followed with most advantage in America, and without fear of English rivalry, are those which produce articles too bulky or too heavy, in proportion to their value, to bear the expense of a long carriage, or of which the materials are found in the country, and can be wrought up there at less expense than by carrying them to cheaper tradesmen at a distance. Some of these branches may be mentioned—such as the making of soap, candles, and hats; tanning and working in leather, particularly bulky articles; building of carriages; making of all kinds of agricultural implements; carpentry, sawing, and turning of most descriptions; building of ships and steamboats; constructing and putting up of millwork and machinery; distilling: the employments of goldsmiths, tinsmiths, and printers. There are several businesses, however, whose prospects depend chiefly on prohibiting the cheaper manufactures of England, and which of course are liable to be deranged by any alteration in the tariff laws: these are the making of glass and earthenware; spinning and weaving most kinds of cotton goods; making of woollens, carpets, &c.; most of the finer kinds of hardware, iron, steel, and brass; hempen goods and silk goods.

Within the last few years the manufacture of cotton has been conducted on a great scale, by means of factories on the same plan as those in England. The cotton manufacture was introduced only in 1790, and in 1832 it was found that the number of mills in twelve states was 795, of spindles 1,246,503, of power looms 33,506; of males employed in the manufacture 18,539, females 38,027—total employed, 57,466. The amount of capital now invested in this thriving branch of trade, is estimated at 45,000,000 dollars, equal to £9,375,000 sterling, being about a fourth part of the capital invested in the cotton manufacture in Great Britain. By procuring the cotton cheaper than can be done in England, the Americans have an important advantage; wages, however, are higher. The principal cotton manufacturing districts are in Massachusetts, Maine, and other states on the coast. The chief seat of the manufacture is Lowell, in Massachusetts, and it may be termed the Manchester of America. Besides containing at least a dozen factories for cotton and woollen fabrics, Lowell possesses large machine-making establishments, which employ many hundreds of workmen. All the improvements in mechanism in England speedily find their way to this spot.

Household manufactures of woollen, linen, and cotton, are made to a great extent. Many families spin, weave, and make up their own clothing, sheeting, table-linen, &c. They purchase cotton, and mix it up in the yarn with their linen and woollen stuffs; blankets, quilts, coverlids, stockings, mits, &c., are made chiefly in the family. These are perhaps neither so fine nor made so expeditiously as those of regular tradesmen; but they are produced for domestic use at times when there is no other employment, and in this manner may be said to cost nothing except the material of which they are made. It is supposed that nearly two-thirds of the domestic clothing is so made in country places, many families, as in Canada, having a loom in the house. It is the same with soap, candles, and maple-sugar, all of which are manufactured by the farmers at home. The articles made by families in the state of New York for their own use, were, in 1831, reckoned at £1,045,360, in value. Attempts have recently been made, with great success, to introduce the manufacture of silk; the mulberry-tree grows spontaneously in the middle states, and the light, easy labour which the collecting of the silk requires, would afford employment to old people and females, enabling them to add to the income of their families, when they could not otherwise be able to do any thing.

The native American manufactures, limited as they are in some respects, are sufficient to give employment to every one who wishes to work; and there is still a continual call for new hands. Capital also finds abundant remuneration in the existing state of things, so that there seems to be no necessity for the Americans troubling themselves to establish new manufactures, all their spare hands and spare money being already occupied to advantage. English workmen, who are skilful and steady, are almost certain of finding employment with good wages, in one or other of the manufacturing towns; but it is here necessary to state, that the American manufacturers make serious complaints against operatives from British factories, whom they describe as arrogant, intemperate, and unsettled in habits. The chief ground of complaint is their intemperance, a circumstance partly

arising from the cheapness and abundance of intoxicating liquors, but also from a want of due personal control. We mention this as a warning; for no intemperately disposed workmen need think of leaving their employment in Britain to find an asylum in American factories.

In the southern states there is little manufacturing; the inhabitants there depend on the northern states or on foreign countries for their supplies, and their exports are cotton, sugar, and other raw materials.

COMMERCE.

The wealthiest class in the United States is generally the merchants of large sea-port towns. Commerce may be considered as forming the aristocracy of that country, and is regarded everywhere as highly honourable. Young people are educated for it with as much care as for the army, or for any of the learned professions; and they acquire a knowledge of the languages of the foreign countries with which they propose to be connected, their modes of transacting business, &c., instead of learning dead languages, and the manners of extinct nations, as with us. The manufactures and markets of foreign states—the quality, value, and profits of every commercial article—form the objects of their study, and prepare them for engaging in business with system and advantage. The same energy of character which has brought English commerce to the highest pitch, is carrying forward the United States in a similar career, but perhaps with undue speed. The chief fault of the American commercial character is an over-haste to be rich. This "go-ahead" policy leads to wild speculations, on an extensive scale, which produce most disastrous results on the currency and finances of the nation.* At an interval of every few years, the banks suspend payments of their notes in cash; debts due to foreign merchants and others cannot be liquidated, and money is scarcely to be had—all which mischiefs directly arise from a spirit of over-trading, instead of pursuing the path to wealth by a course of patient and accumulative industry.

The tonnage employed in the foreign and internal trade of the States, in 1838, was 1,741,391 tons of shipping, and about 140,000 seamen—numbers little less than those of Britain. In the papers presented to Congress, we have the following statement of the amount of exports and imports in the year 1838:—

EXPORTS.

Produce of the Forests,	$5,200,490
Fisheries, &c.	3,175,576
Agricultural produce—	
Cotton,	61,556,811
Tobacco,	7,302,029
Vegetable food,	6,781,064
Products of animals (skins, &c.),	2,340,850
Other agricultural products,	140,093
Manufactures—	
Cotton goods,	3,758,755
Other manufactures,	5,704,544
	$96,033,821

IMPORTS.

Articles free of duty,	$60,990,005
Articles paying a specific duty,	25,726,919
Articles paying duty according to their value,	27,000,480
	$113,717,404

Tables are given of the different countries with which this trade is carried on. The following abstract will give an idea of the extent of transactions with each in 1838:—

	Imports.	Exports
Russia,	$1,898,396	$1,043,[illegible]
Germany, Holland, and Belgium,	4,301,812	7,943,[illegible]
Sweden, Norway, Denmark,	881,880	400,[illegible]
Britain,	44,861,688	52,170,610
Spain and Portugal,	1,399,400	505,407
France,	17,771,797	15,783,516
Mediterranean,	1,936,402	1,629,173
Gibraltar,	25,024	762,[illegible]
Africa and Islands,	1,520,033	834,709
West Indies generally,	18,614,583	13,[illegible],449
Hayti,	1,275,762	910,233
British America,	1,555,570	2,723,494
Mexico,	3,500,709	[illegible],664,097
Brazil,	3,191,238	[illegible],657,194
South America generally,	8,042,361	6,252,288
East Indies and Asia,	1,494,556	1,291,661
China,	4,764,536	1,516,649
South Seas,	55,561	82,857

The annual amount of American commerce is about twenty-eight millions sterling imports, and twenty-four millions exports. This excess of the imports over the exports has continued since the year 1831, but the difference is now considerably less than it was at that time. It appears that these sums form about half the amount of the British foreign trade. The American shipping, however, is nearly equal in tonnage to that of Britain. This apparent inconsistency is accounted for in two ways: first, a great deal of the trade to Britain is carried on in American bottoms, and not equally in ships of the two countries; and, secondly, there is a larger quantity of tonnage occupied by the Americans in the coasting or internal trade of the country than there is in Britain. It is, in fact, the traffic between the different parts of the Union, which gives its chief activity to American commerce.

The immense number of navigable rivers which run through the country in every direction, and discharge themselves into the ocean or the lakes, afford the means of a great internal trade. These facilities have been increased at many important points by canals, connecting the different rivers at points where they approach each other, or where they flow away in opposite directions from sources lying in the same neighbourhood. Between the southern and eastern states there is a constant interchange of commodities along the coast, and a similar trade goes on from the western states to the south, by the Ohio and its branches, down the Mississippi. New Orleans is the great entrepôt for the goods of the latter branch of internal commerce. The north-eastern states furnish rum, molasses, cordials, dried fish, European goods of all descriptions, and articles of small value, quaintly styled *notions*: and they take in return corn, grain, cotton, and tobacco, from the south; while from the western states are received hams, beef, lard, flour, &c., either for use or for exportation to the West Indies and the other parts of Southern America. To show the extent to which this traffic is carried, we may mention that there are two hundred large steamboats on the Mississippi, making the voyage up and down in twenty-four days. The cargo of one of these is given as follows:—501 barrels of pork, 9 hogsheads of hams, 2138 kegs of lard, 3147 barrels of flour, 30 barrels gin, 92 barrels beef, 50 boxes merchandise, 32 barrels porter 224 barrels eggs, 50 horses, 32 cabin passengers, 15 deck do., 31 way do., and this was the usual cargo every trip. The traffic from north to south along the coast is greater than might be inferred, even from this specimen of internal trade by the rivers; because the productions of the northern and southern districts on the sea-coast are as different from each other as those inland, while the states in that part of the country have been longer and more densely peopled. This active intercourse by rivers, canals, railroads, and sea-coast, increases the value of land and of industry everywhere: the produce of the agricultural countries can always be sent easily to the towns, and that of manufacturing places to those which are more exclusively agricultural. The United States have too lately commenced industrial operations, to pos

* The standard currency of the States is in dollars silver coins worth about 4s. 3d. sterling each; each dollar is equal to 100 small copper coins called cents.

ness either the wealth or available resources of such an old-settled and industrious country as England, and therefore both the currency and means of defence are upon a comparatively meagre scale. The bulk of the money, for instance, employed on great public works, and borrowed by the different states, has been lent by British capitalists; of the stock of the United States Bank, five-sevenths were understood to belong to England. So stupendous, however, are the natural resources of the States, and so readily may they be developed, that with peace, and by following those pursuits of industry which are appropriate to the country, the nation at large cannot remain long a debtor to foreign powers.

CANALS, RAILWAYS, AND PUBLIC WORKS.

When America was first settled, the people chose lands in the vicinity of the sea or navigable rivers, so as to have the means of free communication to all parts by water; and lands even of inferior quality were found more valuable in such districts than richer soils in places where the produce could not be brought to market. All the available ground, however, in these favourable situations, was soon occupied, and people who wished to settle were forced to cultivate lands very inconveniently placed for carriage and communication with markets. These lands, however rich, afforded no more than the means of subsistence to their occupants, who, as they could send little or nothing to the great towns, could buy nothing from thence; they contributed, therefore, very little to the general trading prosperity of the country. It was not until after the last war with Great Britain that the Americans saw what advantages might be afforded to such districts by the establishment of railways and canals, and immense efforts were made to set such works on foot. Their enterprise has been successful. The canals and railways of that country are now hardly to be equalled in the world, and these channels have opened the tide of population and prosperity into inland districts and rich lands, which must otherwise have lain waste and lost, except to a few slovenly and ignorant persons. One of the states alone (Pennsylvania) has, since 1826, devoted no less than £5,800,000 to this object. New York has been even more liberal; and there is no part of the country (always excepting the slave states, which in this respect, as in all others, are greatly behind) where such means are not taken to afford the occupiers of land means of bringing their produce to the market of cities. This is a matter which very nearly concerns the settler everywhere; because, however good the soil of his farm, or however unremitting his own industry may be, every advantage would be thrown away, if he could not get the produce disposed of. Some of the settlers in Canada, at the head of Lake Erie, were so badly off in this respect, till the opening of the Erie canal, that their surplus wheat and cattle were worth nothing: money was not given for farm-produce in that quarter. Wherever there is a good canal or navigable river, on the other hand, the prices of farm-produce rise, and land which was unsaleable becomes in request, and is covered with a throng of settlers from Europe, or of the restless speculators of America.

The Erie canal was planned by an American patriot, Mr. De Witt Clinton, and was carried into effect at the expense of the state of New York. It extends three hundred and sixty miles along a rich and fertile country, which had formerly no communication with markets, but which can now send its produce to the sea in two directions. It is forty feet wide at top, twenty-eight at bottom, and four feet deep. It was finished in five years, at an expense of 9,027,456 dollars. The waters of Lake Champlain are connected with the Erie canal by another sixty-three miles long, which was executed at an expense of 1,179,871 dollars. The amount of tolls collected on these canals, in 1822, was 44,486 dollars, and in 1834 this had increased to 1,313,155 dollars.

Houses, villages, and towns, are starting up along the whole line of the Erie canal, with unexampled rapidity. Lockport, for example, is a place where the canal is carried by locks up a steep rock of seventy feet. This spot has been suddenly transformed from a wilderness into a thriving village of two thousand inhabitants. Rochester is another example of the benefits the canal has conferred on the country: at that place there was abundance of most fertile land, and there were also certain falls on the river Genessee, which were admirably adapted for giving water-power to mills and other machinery; but all these advantages existed to little purpose without good roads and markets. The opening of the canal has supplied these; and the consequence has been, that Rochester has all at once started up from a desert into a populous city, and presents, says Mr. Fergusson, a remarkable instance of what may be done in the way of transition, exhibiting in its streets a perfect sample of the progress from stumps to steeples. It is not long ago since its most crowded streets were a forest. The first settlers cut down the trees, leaving the stumps standing till they had more leisure; and this place now presents as elegant buildings as any in Europe, with churches whose steeples might do credit to London or Edinburgh.

This canal terminates in Lake Erie, and forms a channel by which the trade of the large inland seas, Lake Erie, Lake Huron, and Lake Michigan, may find access to markets in the populous cities of western America and Europe. The fertile shores of these lakes will therefore be rapidly settled, and all their natural advantages soon be brought into operation for the profit of mankind.

There are a number of other large and useful canals in this state, such as the Oswego canal, the Cayuga and Seneca canal, besides several others which are in progress. The whole extent of canals in the state of New York, in 1833, was 535 miles. A number of the great rivers of America have been connected by canals. Thus, a canal stretches from the Delaware to the Hudson; from the Delaware to the Chesapeake; and from the Chesapeake to the Ohio. The rivers Potomac and Shenandoah, which were formerly obstructed by rapids, have been rendered completely navigable by the construction of canals and lockage at each of the rapids.

It would be idle in us to attempt here an enumeration of even a small proportion of the undertakings of this nature which have been executed in America. Wherever the navigation of a river has been impeded by rapids, or the occasional shallowness of its bed, the obstacle has been overcome, if there were either useful minerals or fertile land to be made accessible. Along the banks of some rivers of this kind, canals have been carried for 100 miles; as, for instance, the canalling of the Lehigh and Schuylkill, in Pennsylvania. Wherever two navigable streams, flowing to different seas, are separated by a ridge which it is possible to penetrate by a canal, the work is attempted, and the communication made complete from sea to sea. Examples of this are found in the Champlain canal, which is completed, and connects the Hudson and St. Lawrence; and in canals between the Miami and the Wabash, the Fox river and the Ouisconsin, which are both likely to be effected. It is not that the Americans are more generous or more patriotic than other people, that they undertake these works; it seems rather to arise from a spirit of restless enterprise, which cannot be satisfied with turning to advantage the land within their reach, but must be always hurrying away to secure the resources of some new region which is supposed to be more fertile than any yet discovered. Another reason for the manner in which the Americans

outstrip the British in this species of undertaking, ought to be mentioned. All great improvements in this country are impeded by powerful factions of men who thrive upon ancient systems, however absurd; whereas in America all classes seem to strive to improve the country on general principles of utility, without regard to antiquated usages. Whatever may be the cause, it has had the effect of opening up to the over-crowded population of Europe rich and inexhaustible countries, to which they may emigrate for ages without filling them, but which would have been of little advantage without the channels of communication now opening by the Americans.

Although it is only since the year 1824 that railroads have been used for general traffic in the United States, yet that country has a greater extent of railroads than any country in Europe. Some of these are of great magnitude, and others have been constructed in places where the difficulties might have been thought almost insurmountable. The Camden and Amboy railroad is sixty-one miles in length, and brings the cities of New York and Philadelphia within a few hours' journey of each other. The Philadelphia and Columbia road, with the portage-road over the Alleghany mountains, constitute part of the great inland communication between the Delaware and Lake Erie. The railroad over the mountains is thirty-six miles long, and in this distance overcomes a rise and fall of 2570 feet. In one part of it there is a tunnel 900 feet long cut through the solid rock, and it has ten stationary steam engines and ten inclined planes. This stupendous work cost about 1,750,000 dollars.

In South Carolina a railroad extends from Charleston to Hamburgh, a distance of one hundred and thirty-five miles. It is altogether built upon piles of wood, and may be considered as one continuous bridge. The whole expense of this road was 1,336,615 dollars. A railway has also been projected, and is now partly opened, from Baltimore to Pittsburg, a distance of three hundred and thirty miles. The railroads in America are so numerous, that it would be almost impossible to enumerate them all. There are now upwards of three thousand miles of railroads in the United States. The capital expended in the construction of these has been estimated at 60,000,000 dollars (about £15,000,000 sterling), or at an average of 20,000 dollars per mile. Passengers pay about 5 cents per mile, and goods are charged 7½ cents per ton per mile. The average speed is from twelve to fifteen miles an hour, stoppages included.

SEA-COAST, LAKES, AND NAVIGABLE RIVERS.

Bays and Harbours on the Sea-Coast.—There are some countries which are deprived of the advantage of bays, harbours, and good protection for shipping. France, for instance, with a long line of sea-coast, has but few of these natural advantages; and a more remarkable instance still is afforded by the coast of Coromandel in India, which has not one good harbour or bay where vessels might take shelter, along its whole extent. America is very differently situated in this respect: from north to south along the whole coast which fronts the Atlantic, the country is deeply indented with large navigable bays, which afford ready protection to her shipping, and give points of rendezvous to the trade of numerous rivers which fall into them. It would be needless to mention the whole of these: the smallest of them, on the coast of India, where ships are exposed to all the hazards of an open sea, and lie off, delivering their cargoes by means of rafts or lighters sent backwards and forwards to the shore, would be reckoned sufficient to give wealth and importance to a large city. They are so numerous on the coast of America, that the commercial facilities of half of them cannot be taken advantage of. Among the principal is the Bay of Chesapeake, where the mouths (or firths) of several large rivers, the Susquehannah, the Potomac, the James, the Rappahannoc, &c., meet together, and concentrate the commerce of a large tract of country belonging to each. There is hardly another bay in the world which, by the rivers that fall into it, gives access to inland places so remote from each other. North from this is the Bay of Delaware, very little inferior to it in the facilities it affords for trade, and the communication its rivers (the Delaware, Lehigh, Schuylkill, &c.) afford with the interior. North from these is the Bay of New York, which affords an entrance to the large river Hudson, besides several others; and which, by means of canals, has now a communication with the St. Lawrence, the lakes of Canada, and the whole fertile country lying on the banks of these, forming an extent of inland navigable waters larger than any other which is known.

The coast north from New York has the Bays of Providence, Barnstable, Boston Harbour, Penobscot, &c., all of the greatest utility for shipping, and enabling the people to bring all the natural advantages of the country into operation for commerce.

To the south of the Chesapeake, in the slave countries, there are also many noble harbours, bays, and rivers, which, under circumstances more favourable to the moral and commercial improvement of the people, would give to the trade of this part of the Union all the facilities which have contributed so powerfully to the prosperity of the north.

Lakes.—The American states are bounded to the north by a chain of the largest fresh-water lakes on the globe, which are all connected together by one continuous river, called, after it leaves them at its lower portion or outlet, the St. Lawrence. These lakes lie along the summit of a range of elevated ground, which stretches nearly across the continent, occupying certain deep cavities hollowed out on this summit level, and they receive the waters of all those small rivers which are formed on the flat region lying around them. The principal lakes are four in number, and are called (beginning from the eastward) Lakes Ontario, Erie, Huron, Michigan, and Superior; the navigation from Lake Ontario to Lake Erie is interrupted by the Falls of Niagara, where that river (the same which is called the St. Lawrence after it quits the lakes) is precipitated over a rock of 160 feet high. From Erie to Huron, vessels of large size pass uninterrupted, but the communication is impeded in the channel which connects Lakes Michigan and Superior with Lake Huron, by the straits of St. Mary. At Niagara, a canal, called the Welland Canal, has been formed by the British government on the Canada side of the river, which enables vessels to pass from Ontario to Erie without impediment; and the like will no doubt be performed by one or other of the governments for the straits of St. Mary, whenever the commerce upon these more remote lakes shall justify the expense of such an undertaking. The whole chain of those inland seas will then be navigable from one end to the other; and as their shores are all of great fertility, the region lying around them may be expected at some future time to be one of the busiest and richest on the globe. At present, as they extend along the northern limits of the United States, they afford to that inland boundary nearly the same commercial advantages as those possessed by a sea-coast, and give a sensible stimulus to the industry of all the districts connected with them. The following is a summary of particulars connected with the extent, depth, &c., of the lakes:—

Name.	Length. Miles.	Width. Miles.	Depth. Feet.	Elevation above the Sea—Feet.
Ontario,	180	40	500	231
Erie,	270	80	200	565½
Huron,	250	100	900	618
Michigan,	400	50	unknown.	618
Superior,	480	109	900	641

None of the navigable rivers of the United States fall into the lakes, and there is no river that flows out of them over which that country has command, so that it would appear that the advantages it can derive from them are but limited. To remedy this inconvenience, which the Americans soon perceived and regretted, they have led canals from the most of their inland districts to the upper portion of the lakes; while from their lower shore (or that which is next the sea) they have conducted others, to give them an outlet to the ocean within their own territory. The navigation is thus rendered complete, from the shores of the sea at New York, by a canal, to Lake Erie; thence to Huron and Michigan; and from thence by other canals to the inland states of the west.

Navigable Rivers.—The navigable rivers on the eastern side of America are numerous and important. We may first mention the Connecticut, a large stream flowing into the Atlantic near the north-east end of Long Island: the Hudson, a river navigable for steamboats of the largest class for one hundred and sixty miles above its mouth, and the channel which has enabled New York to extend its commerce by a canal to the lakes: the Delaware, flowing past Philadelphia, and affording communication by itself or its tributaries with a country three hundred miles in length, and of nearly equal breadth: the Susquehannah, the Potomac, the James River, and others flowing into the Bay of Chesapeake, which, by the help of canals, afford entrance to vessels of one kind or other into the deepest valleys and recesses of the eastern country. Southward are the Roanoke, flowing into Albemarle Sound, and the Pamlico river, affording channels for the commerce of North Carolina; while South Carolina and Georgia are canalled in the most complete manner (if we may use the expression) by the rivers Pedee, Santee, Savannah, Ogeechee, Alatamaha, &c.; and East Florida enjoys the same convenience in the River St. John's and its branches.

But the eastern rivers, useful as they are (and they have certainly as yet been the chief seats of commerce in the country), are by the Americans themselves entirely lost sight of in the enthusiasm of their admiration for the immense streams which water the western and inland states. These great rivers are certainly not to be equalled in any other country, at least in any country which has had such skill, or such a form of government, as have enabled its people to turn the commercial facilities of their inland waters to proper advantage. The rivers to which we allude are the Mississippi, and the large tributaries which arrive from the east and west to fall into the channel of that great stream.

The number of steamboats on the western rivers in 1834 was about 230, measuring 39,000 tons. Besides these, there are 4000 flat-bottomed and keel boats, with a tonnage amounting to 160,000. Only a few of these vessels, however, are fit to go to sea, being only suited for river navigation.

MINERALS.

There is a great variety of useful minerals distributed through different parts of the states. Coal may be mentioned among the first: it exists through all the country, lying north of a line drawn from Philadelphia to the mouth of the Ohio, and is particularly abundant on the upper waters of the Susquehannah, as well as on the Alleghany and the Monongahela. At Pittsburg there is a hill principally composed of coal, and it is found at many places in this district within a few feet of the surface. There are extensive coal mines also on the Roanoke and Appomatox, in Virginia.

The country on the Ohio is particularly rich in mineral productions. The whole district is bottomed on limestone, on which rests the wide and valuable coal formation mentioned above, extending from the head waters of the Ohio, in Pennsylvania, to the River Tombigbee. Iron ore is found abundantly in the same district, principally towards the upper part of the Ohio; bog ore is found in the valleys of the Alleghany chain; and various kinds of ores, of the same metal, are met with in the New England states: at one place, carbonate of iron is found, which, on being reduced, produces steel, and is called *steel ore*. Black lead, in beds of from five to six feet wide, traverses the states of New York, Jersey, Virginia, Carolina, &c. Copper ore is found in Virginia, in Connecticut, and in New Jersey: it exists also in the neighbourhood of the lakes; and a piece of pure malleable copper, weighing three pounds, was found in Illinois.

Gold mines have been traced extending through a large tract of country in the western parts of Virginia, North and South Carolina, and Georgia: they are wrought to a considerable extent, 20,000 men being employed at the different workings: the miners, who are people of all countries, say that the produce is richer than that of any other mines on the globe: one piece of pure gold was found weighing twenty-eight pounds. The annual produce is about one million sterling; but we have not heard what proportion of this is expended in the work, or what actual profit has been realized. One singular fact is remarked concerning these mines, which is, the indubitable evidences found that they have been wrought at some period before America was known to the Europeans. Many pieces of machinery which were used for this purpose have been discovered in the workings, among which were several crucibles of earthenware, which are far better than those now in use.

Silver and its ores are not of frequent or extensive occurrence. Mercury has been found native in Kentucky, but it occurs plentifully in the ore as bituminous cinnabar, through the Ohio and Michigan territory. It is found in the soil as a black or red sand, sometimes as a fine red powder, and at other times in iron clay. There are lead mines of vast extent on the Missouri; they are said to occupy a surface of six hundred miles in length, and two hundred in breadth. One miner will raise about two thousand pounds per day, which sell for forty-five dollars, and yield twelve hundred pounds of pure lead.

Epsom Salts, Glauber salts, and nitre, are found in Ohio and Indiana; the two latter in caves, the former in a thin layer on rocky surfaces. Salt, which in countries far removed from the sea is an article of great expense, is produced from salt springs, or from borings in different parts of the western country. Mineral waters of valuable medicinal qualities occur at several places; the springs principally frequented are those of Saratoga, in New York. Oil of vitriol, or sulphuric acid, is got almost pure from the earth, in Genessee, near the town of Byron. It oozes out from the soil of a low hummock, and may be collected by digging holes in the ground. There are several places where inflammable gas issues from the earth: one is a small lake called Sodom, the bottom of which is formed of grass-green slate, the sides of white shell-marl, and the brim of black mould; the water is uncommonly transparent, so that the basin looks like an immense porcelain bowl; the water is of the quality of that of Harrowgate; the gas issues from it abundantly, and, when kindled, burns along the surface with a bright red flame by daylight.

GEOLOGICAL PECULIARITIES.

In examining the geological structure of the American continent, some singularities have been observed, which are believed not to correspond with the theories formed in Europe on this subject. We shall mention a few of those which appear to be most interesting. There is no

chalk found anywhere in the states, neither is there any roestone (or oolite, as it is called by geologists), though the localities where both might be expected are sufficiently marked. Mr. Maclure states, that some shells of the recent alluvial formations in New Jersey are identical with species found in the secondary rocks. There have been discovered in naked limestone of the elder secondary formation, the prints of human feet; the marks are those of a man of ordinary size standing erect, with his heels drawn in, and his toes turned outward; the toes are much spread, and the feet flattened, like those of people not accustomed to shoes; the impressions are strikingly faithful, exhibiting every muscular swell and depression with accuracy. Every thing seems to warrant the conclusion, that these marks were made at a time when the rock was soft, and received them by pressure, which geology dates at a period very long indeed before the general flood. They were examined by Governor Cass and Mr. Schoolcraft, at St. Louis and Herculaneum, on the Mississippi, and they exist also at the Cumberland mountains, always in the same kind of limestone. Other singular facts (unconnected, however, with the above) have been observed in this district. At Pickaway plains, on the Ohio, a human skeleton was found seventeen feet below the surface, in a bed of pebbles and shells deposited by water, and having nine feet of earth over them. At Cincinnati, in digging a well, an arrow-head was found ninety feet below the surface; and in Illinois, fragments of antique pottery and jars of coarse earthenware have been found at a depth of eighty feet below ground. In forming the Erie canal, the workmen, when digging this ridge of gravel, found several hundred living shellfish at a depth of forty-two feet. They were chiefly of two kinds of *mya*, a salt-water mussel, of which several species exist in Britain: one, called *smurstin*, is used for food in Zetland, and another is eaten about Cork, where it is called *sugar loons*; we do not know if the species which were dug out of the gravel are found among the present American shellfish. *Living toads* have been found in America, as here, in solid rock, of what has been called the millstone-grit.

PECULIARITIES OF DIFFERENT DISTRICTS.

America is generally considered and spoken of as one country, its people as forming a single nation, and the remarks which are made with regard to one part of it are supposed to be equally applicable to all. No idea, however, can be more fallacious. The region which we term the United States is composed of sections of country as remote from each other as London is from Constantinople, or Madrid from Berlin: they lie under different climates, and the different circumstances under which their inhabitants are placed form in each a totally different set of manners. The English language is common to all, and they all profess the Christian religion; but in most other respects the difference between them is as great as between any two European nations. The great divisions under which the country ought to be viewed are the north-eastern or New England states, in which for the present may be included Pennsylvania; 2d, The southern or slave states, to which section also we may refer Kentucky and Tennessee; and, 3d, The new states of the west, which are in progress of settlement. The manners of the New England states are formed on the model of those of our own country, and there are few circumstances in the nature of the climate which tend to produce any material alteration; it is among them only that due provision is made for the education of the people or for religious instruction. The productions of the soil—the modes of agriculture—the arts and occupations to which these give rise—the alternations of season—and many other things, have all a resemblance to those of our own country. They cultivate wheat and the other European grains; their garden vegetables, potatoes, turnips, carrots, cabbages, &c., are the same as ours; they employ the same domestic animals; and they use, of course, the same agricultural implements, the same grist-mills, &c., requiring also the same tradesmen to prepare and work them.

Even in these great divisions which we have pointed out, there are portions which differ exceedingly from each other. New Orleans, for instance, which belongs to the slave states, has a completely different set of manners from Charleston in South Carolina. The former is a city of immense trade, situated at the mouth of the great river Mississippi; it contains a mixed population of blacks of all shades, and of white men from every nation in Europe. Its streets are crowded and speckled with people of every colour; its quays with ships of every country; and its wharfs are loaded with bales of goods from all quarters of the earth, some coming from Europe or from China, to be carried for three thousand miles up the inland rivers of America; others sent down these rivers some months' voyage, to be carried to the West Indies or the Mediterranean. The air of the place is unwholesome, and it is a mart where people hurry to make money before they be overtaken with disease and death. Such are the influences under which the manners and character of the people of New Orleans are formed. Charleston, on the other hand, is the capital of a wealthy agricultural state; the pursuits of the people are not decidedly commercial; the town is the resort of numerous country gentlemen, who pride themselves rather on the oldness and respectability of their families, and the extent of their property, than on the activity of their business habits. The gentry strive to keep up, between themselves and their slaves, an exterior resemblance to the feudal relations of Europe; coats of arms are fashionable, as are liveries for servants: there is a general air of elegance and splendour in the buildings of the town: some of the houses "are real palazzos, surrounded with orange trees, magnolias, and other trees of an almost tropical climate." There is much taste for the fine arts among the higher classes, and among the lower an absence of all that bustle and variety of language and dress which mark a great commercial city. It is obvious, therefore, that the manners of these two places can have very little in common.

If we glance at the northern states, we shall find a difference of a similar kind existing between New York and Philadelphia. The former city is the great thoroughfare of all emigrants and commercial agents who arrive from Europe; the people passing through it daily are sometimes estimated at 15,000 or 20,000; it lies at a central point, having communication, by rivers, canals, and railroads, with the whole northern parts of the American continent. Grain, provisions, lumber, and manufactures, are brought from countries a thousand miles inland, for exportation, or for the use of places along the coast which have not the same facility of conveyance. People arriving there are secure of finding a passage to every other city inland or coastways; hence the streets and quays are constantly crowded with travellers and their luggage. The extent of its commercial transactions gives a facility to those who wish to engage in any kind of speculation, because here they can always learn the prices or the demand for every article of American produce; hence there is a restlessness, bustle, and continual spirit of change among its population, or a great part of it, which it would be vain to seek elsewhere in Europe or in America. Philadelphia, on the other hand, though also a place of very extensive commerce, has fewer channels of communication with the distant inland countries, and has of course a smaller variety of produce either raw or manufactured: hence there is less speculation; business proceeds with more steadiness, but less apparent bustle; there is in the streets an air of quiet regularity

where every one seems to go easily and leisurely about his business: and the transit of strangers through the place is but inconsiderable. The prevailing religion, which is Quakerism, has also a manifest influence in producing these effects. The influence of circumstances upon the manners of a people is nowhere more remarkable than it is here in the case of the negroes. Slavery is not permitted in this state; and the inhabitants do not countenance in all its severity that feeling of contempt with which black people are regarded in other parts of the Union; hence the Africans reside here in freedom and comfort, while they see their countrymen, a few miles to the southward, poor degraded slaves; and they are generally in consequence a contented, cheerful, and industrious caste.

Again, if we look at the western states, we shall find that, though there is a certain uniformity of manners over the whole, they are here also differently modified, according to circumstances. Pittsburg, for instance, with the neighbouring towns, Wheeling and Steubenville, are in the centre of a country which is rich in various kinds of minerals—coal, iron, lime, &c.; they are therefore filled with a manufacturing population, and the pursuits, appearance, and manners of their inhabitants, differ from those of the country around them, as those of Birmingham may be supposed to do from other places in the centre of England. The town of Cincinnati, again, which is situated on the Ohio, as these places also are, is a great inland depôt for merchandise to be exported or imported. Its inhabitants are merchants, attendants in counting-houses and warerooms, owners of river steamboats, and a population attracted by the general trade of the place, while there is also a large number who are occupied in the very peculiar business of killing and preserving for exportation the immense quantities of live-stock reared in the country.

CLIMATE, SOIL, AND NATURAL PRODUCTIONS.

The state of Maine, which is the farthest north of the Union, reaches to latitude 48°: Florida, on the south, extends to within 25° of the equator. Between these two points there is a great variety of climate, and the differences of temperature are increased by the flat or sheltered situation of some districts, and the mountainous features of others. The New England states and Pennsylvania, lying between 40° and 48° north, approach nearest to the climate of England; but, owing to causes which are not yet perfectly understood, the whole Atlantic coast is warmer in summer and colder in winter, by about 10 degrees, than the same latitudes in Europe. Some of the plants of this country, such as the holly, and the common *whin* or furze, when transplanted thither, fade equally under the heats of summer and the frosts of the cold season, and cannot be preserved except in greenhouses. In winter the rivers are frozen, so as to bear horses and wagons. The air is in general drier than in this country, and wet showery weather much less frequent; so that farm work is conducted with more regularity and more security than with us. Winter does not set in till the middle of December; after which frosts continue with more or less severity till March, with frequent and great changes from mild weather to intense cold. In April, the season becomes again fine, sunny, and dry.

In the states south of the Potomac, the climate is much warmer; the winters, which indeed are hardly to be called winters in our sense of the word, are short and mild, frost being little felt except during the night. The heat of the warm season is like that of tropical countries; but this is felt chiefly on the sea-coast, which is in general low, flat, and far from healthy. The inland parts being more elevated and hilly, the climate there is more temperate. The whole coast from north to south is subject to tremendous hurricanes, which sometimes do much mischief.

The climate of the western states, forming what is called the Basin of the Ohio, is different both from that of New England and from the southern districts in the same latitudes. The *average temperature of the year* is nearly the same at corresponding points on both; but there are fewer inequalities in the west, neither the heat nor cold reaching the same extremes. The thermometer seldom falls more than ten or twelve degrees below the freezing-point. Frost does not become permanent till near the close of December, when standing water and small rills are frozen from three to fifteen days. Many plants, such as the cotton, the catalpa, sassafras, the Illinois nut, flourish in the western states, in latitudes where they would not thrive on the sea-coast. The air is more moist, fogs and heavy dews more common.

Soil.—That portion of the New England states which lies east of the river Hudson, is broken and hilly; the soil in general thin, unproductive, and better adapted for pasture than tillage. From New York, all along the sea-coast southward to the Mississippi, there is a tract of flat sandy soil extending inland from thirty to one hundred miles; it produces nothing but shrubs and pine-trees, except on the banks of rivers and marshy places, where rice is grown. Backward from this line to the foot of the Alleghany Mountains, there is a tract of coarse land of variable breadth, but of great fertility. The Alleghanies themselves are not cultivated, but the valleys between their ridges are rich and useful lands. The district inland from these is the Basin of the Mississippi, a region of vast extent; it is generally bottomed on limestone, well watered, and inexhaustibly productive.

Agricultural Productions.—Oats, rye, and barley, are raised in all the northern states, and also in the hilly districts of the south. Of barley, two crops in a season are obtained in favourable situations. Maize is common to every part of the Union, but thrives best in the middle states; it is a vegetable adapted to a greater variety of soil and climate than wheat, and yields a much larger produce. The sugar maple grows everywhere, but thrives best in the good maize districts. Wheat is also cultivated through the whole Union; but it is only a profitable crop to the north of the Potomac, or in the hilly districts of the south; in these situations it yields large returns, and of excellent quality; in the low warm districts it is not cultivated; these are more favourable to the rice crop. In general, it is remarked that the late wheat countries are favourable to the European constitution, and that in rice countries, which are warm and moist, the African population has a great advantage in respect to health and longevity over whites.

The cultivation of tobacco begins in Maryland, in latitude 39°; it is raised to a greater extent in that state and in Virginia than in any others of the Union; but it thrives also in all the western states. Cotton does not succeed well farther north than the latitude of 37°, though some of the districts raise it for domestic use; it forms the staple of all the districts south of the river Roanoke. The best kinds grow in South Carolina and Georgia, in dry situations, upon the sea-coast. The cultivation of rice occupies nearly the same region as that of cotton: it is a very unhealthy occupation for the slaves who are engaged in it. The climate which is favourable to sugar does not extend beyond the latitude of 32°; it is raised in the states chiefly for domestic use, and is not an article of export to any extent. The crop is rather precarious, from the frosts which sometimes occur even in the most southerly districts. Indigo has been tried in America, but could not come into competition with that of Bengal.

The vine grows spontaneously in most of the southern and western states, and is cultivated as a fruit about Phi-

ladelphia. The mulberry tree, hops, and hemp, all succeed well in the middle and western states.

The timber trees of the states are of numerous kinds, and many of them of the best quality. There are twenty-six kinds of oak, of which eleven or twelve species are in request; the best for common purposes is the *white oak*, a tree which is found plentifully over the whole country: the *live oak* grows in marshy places near the sea, and has a hard, heavy, and durable timber, much used for ship-building. There are eighteen kinds of pine, cedar, and larch; seven kinds of maple, three or four of which furnish sugar—the best is called the sugar maple; ten kinds of walnut trees; four kinds of birch, the bark of one of which furnishes the Indians with canoes; six kinds of ash (the ash of this country is not of the number); besides many other trees, of very useful qualities. There are one hundred and thirty kinds which rise to a height of more than thirty feet; while in France there are only thirty-seven of that size. The flowering shrubs, *kalmia* and *rhododendron*, which are cultivated here with so much attention for their splendid flowers, grow wild on the sides of the American hills to the height of fifteen or twenty feet.

Even in the most thickly peopled states, there are still remaining large tracts of uncleared woodlands, which give the country a wild appearance, and form an aspect on the whole very different from any thing seen in Europe, where forests have long been too valuable to be allowed to remain uncut.

RATES OF PROFIT, WAGES, AND STYLE OF LIVING.

There is abundance of fertile land in the United States, which needs only to be broken up and cleared of woods to yield large returns for a slight outlay. There are none of those obstacles to the cultivation of solitary districts which exist in the lawless or unimproved condition of some other countries. Property is secure everywhere, and there is hardly any spot, however remote, which has not ready communication by rivers, canals, or roads, with one or other of the large cities. Hence, fertile lands which are of easy access are to be found by every one who is at a loss for employment, or who thinks his present occupation less profitable than he would wish. On such soils, the accumulation of capital in agriculture is much more rapid than has ever been exhibited in any other nation. The valuations of 1799 and 1814 furnish interesting information on this head. From these it appears, that, in the fifteen years between these periods, the value of lands and houses (not reckoning slaves) in the seventeen states, had, on an average, increased one hundred and sixty per cent., or from a hundred to two hundred and sixty. The rate of increase for the whole is about 6¼ per cent., and the original capital is doubled in about eleven years. At this rate, capital accumulates more than twice as fast as population; or in other words, the increase of the people is always met by a double increase of the means for employing and maintaining them. These remarks are derived from the condition of the agricultural population; but they apply equally to the whole, the rate of profit being the same in all occupations. No man will submit to take small wages, or to carry on business with slender profits, where he can betake himself to farming, with the certainty of acquiring, in a few years, an independent property, especially where agriculture requires as yet no particular skill or apprenticeship to secure adequate success. The legal rate of interest is seven per cent.; and when money is lent for commercial speculations in the western states, ten per cent. is reckoned favourable terms. The average price of labour was reckoned in 1815 at 80 cents, or 3s. 4d. per day; wheat at 1½ dollar, or 6s. 9d. per bushel (27s. per boll); and at these prices, it has been computed that a labourer can earn as much in one day as will maintain himself, his wife, and four children, for three days nearly. Hence the style of living among all classes is full and liberal; there is less perhaps of that princely but unfeeling magnificence, which, in the palaces of Europe, is so often beheld surrounded and besieged with the importunity of beggars; but there is an equal distribution of comfort everywhere. The houses of the middle classes are well and conveniently furnished. As a specimen of the way in which they live, we may mention, that a man who pays 13s. 6d. per week for board, lodging, and washing, dines at the family table, where there is a roast turkey once or twice a week, fowls, beefsteaks, ham, sausages, pudding, pies, soup, fish, &c.; a variety of these are given at every meal, and generally three kinds of vegetables, with coffee or tea at breakfast and supper.

A beggar is scarcely to be seen; but there are persons in all countries, who, from age or bodily infirmities, are unable to support themselves. In America, these are reckoned on the sea-coast at one to two hundred and thirty of the population; in the interior at one to three hundred and fifty, most of them foreigners or worn-out negroes. In England, the proportion is one to six or seven of the population.

POPULATION OF THE STATES.

The rapid increase of population in the United States is one of the most interesting circumstances connected with their history. When the general style of living among any people is comfortable, and they continue at the same time to add rapidly to their numbers, it is a proof that their country affords abundant resources for subsistence, and that they have industry and skill to turn these to good account. England doubles the number of her people in about one hundred years, Scotland in one hundred and fifty: in America they are doubled in about twenty-five years, and it is reckoned, that, by the end of a century from this date, if the same increase continues, the American population will be more than two hundred millions—a number greater than that of any nation at present speaking one language on the face of the earth. From the rapidity with which successive generations come forward, it is generally remarked that the number of aged persons in any neighbourhood appears small compared with the multitudes of young people by whom they are surrounded; and from the same reason the number of individuals below sixteen, who in other countries form hardly a third of the population, are in America fully one-half of the whole. In Carolina and Kentucky, the number above sixteen was considerably less than that of those under it.

The population at successive periods has been given as follows from the official census:—

	White People.	Blacks.
Population in 1790,	3,929,328	697,697
... 1800.	5,309,758	896,849
... 1810,	7,239,903	1,191,364
... 1820,	9,638,166	1,538,061
... 1830,	12,856,177	2,010,436

These returns show an average increase of thirty-three per cent. in ten years; a rate incomparably greater than has ever been witnessed in any other country. The number of persons who come from Europe to settle in the states is estimated variously, from 8000 to 20,000 yearly; the most accurate accounts incline to the former statement. The number of foreigners not naturalized who were residing in the states in 1830 was 53,687; and as these persons cannot be naturalized till they have been five years in the country, this amount, with a little deduction, may represent the arrivals during the last five years, which will therefore be about ten thousand per annum.

The census for 1830 gives the number of persons

who have attained the age of one hundred and upwards, as follows:—

White men above one hundred,	297
Ditto women,	234
Black people—men,	1099
Ditto women,	1011
	2641

The proportion of black people who live to a great age appears therefore to be much higher than that of the whites. This advantage the African race seem to possess chiefly in the southern districts. In ten of the states south of the Ohio and Potomac, the whole number of white inhabitants was five and a half millions, the number of blacks one million and a half (nearly); yet of the former only three hundred are above one hundred years of age, while of the latter there are 1780—a circumstance which shows that the climate of the south is better fitted for the negro constitution than for that of white people. Of the latter, only one in nineteen thousand arrive at the age of one hundred; while of the Africans one in every nine hundred reaches that age. On the subject of longevity we may mention, that, in August, 1817, within a circle of twelve miles in diameter, in North Carolina, there were living sixteen persons between eighty and ninety years of age, twelve from seventy to eighty, and twelve from sixty to seventy. A child was lately born there whose father was eighty-four and mother fifty-seven years at the time of birth (*Warden's United States—Walsh's Register*). In Cumberland county (Virginia), seven persons died between the ages of ninety and one hundred and twelve years, within a short time of each other. In South Carolina it is remarked, that all who could be found above eighty (1808) were emigrants from Europe, and living in the upper billy country.

THE COLOURED POPULATION.

Slaves.—The states which continue to support slavery are those which lie south of Pennsylvania and the river Ohio, with the new districts to the westward of the Mississippi; in all the others it is abolished. The whole number of slaves in 1830 was two millions. The condition of these poor people is everywhere very low; the field slaves are fed, lodged, and attended to, exactly on the same principle as that on which farmers in this country take care of their oxen and horses; a planter is sorry to see them dying or diseased, because he loses their labour, but they meet with no farther regard. It is frequently profitable to cultivate rice in very marshy grounds, or in fields artificially overflowed, where the negroes must work up to their knees in water in the heat of the day. Numbers of them take sick and die in this unhealthy occupation; but the planter only calculates whether the profits of his crops will pay for the number of new negroes which he is obliged to buy; he never thinks of the distress of these poor people, and even takes credit to himself in being liberal in sacrificing his blacks, in order to keep those rich grounds in cultivation which otherwise must be lost to the country. Mr. Stuart of Dunearn mentions, that even where the slaves were well fed and attended to (as it is the interest of every proprietor to do with his cattle), he found them, in respect to knowledge and feeling, little removed from brutes, while all declared themselves unhappy and miserable in their situation. When their tasks are found deficient, they are whipped, put in the stocks, or forced to wear irons. One person was in the habit of punishing his slaves by fixing them down in coffins, and some of them had died under that treatment. The cruel owner might have been punished by law had there been sufficient evidence of the facts; but as he took care to have no one present but slaves, whose testimony is not admitted in the courts, nothing could be done.

The gangs of slaves on large estates are in general tolerably well fed and clothed; but there is a numerous class of slaves belonging to very poor, and often very improvident, white people, and these are exceedingly wretched, toiling hard, with little subsistence and the harshest treatment. In all cases, the slaves live together with little more feeling of the decencies of life than the brutes that perish. Even when they are employed as waiters in the large inns and hotels of cities, they are not furnished with beds, all lying like dogs in the passages of the house. There are laws by which every one who shall teach a slave to read, or permit him to be taught, may be imprisoned for twelve months. The advantage of having labour performed by slaves, is to the proprietor very considerable: they are maintained at an annual expense of about thirty-five dollars each; while the interest on their original cost, at ten per cent., may be forty dollars; the amount is seventy-five dollars, or about £17 per annum. Now, the wages of a white labourer are here three times as great as in Europe, and cannot be reckoned at less than five hundred or six hundred dollars, from £120 to £150. It is no wonder, therefore, that the proprietors of slaves in America are jealous of any attempts to instruct or emancipate them.

Free Blacks and Coloured People.—From the black people having been first introduced into America as slaves, they are regarded everywhere with great contempt, whether free or in bondage. In the states where slavery remains in force, the free negroes or mulattoes are treated with the greatest contumely; every impediment is thrown in the way of their obtaining education; and the senate of Virginia even voted that the increase of schools for coloured people was a nuisance which ought to be put down: by laws in the several states, any one who may instigate them to resent this ignominious treatment, or in any way to diminish the respect which is commanded to free people of colour for the whites, may be punished by fine and imprisonment. Clergymen in their pulpits, and judges on the bench, are not exempted from this regulation. But even in the free states, though laws of this kind are not in existence, people of colour are subjected to every mortification: they are not allowed to eat at the same table with white men, to attend at the same public meetings, or even to enter the same churches. From being thus always exhibited in a kind of degraded light among the more powerful class, they have not the same respect for themselves which they ought to entertain. Of the persons who are punished for crimes, a larger proportion are people of colour than whites. They have a greater difficulty in getting proper remuneration for their industry or talents than that favoured class; and their exertions are discouraged in all the higher lines of life. Numbers of them, however, notwithstanding all these difficulties, rise to great wealth, and live in a style of much elegance. They have churches and schools for themselves, with ministers and teachers of their own people. Great exertions are making by the Quakers, and other benevolent persons in the free states, to establish and maintain respectable schools for the education of black children. As the memory of their former slavery wears away, they will come to be regarded in a more favourable view. The whole number of free coloured persons in the states is about 300,000.

The Indians.—The number of Indians now remaining within the territory of the states, is estimated to be somewhere between 400,000 and 600,000; of these, about 75,000, consisting of tribes called Cherokees, Creeks, Chickasaws, and Choctaws, are in possession of tracts of land lying contiguous to each other in Georgia, Alabama, and Tennessee. There have been some disputes concerning their territory, and some of the adjoining states have used very despotic means to have them ejected from it: they still, however, retain possession

and as any violence done to them directly would excite much odium both in Europe and among well-thinking people in the states, they are likely now to remain undisturbed. They have quite renounced the character of savages, and are all more or less in progress towards civilization; they cultivate wheat, maize, pumpkins; rear cattle and horses; manufacture cloth, oil, leather, &c. The tribe which has made the greatest advances is the Cherokees, whose population, in 1824, was 15,560; in 1810, it was 12,400, so that they are not falling off in number like the other Indians. They possess a fine, well-watered, and arable country of five millions of acres; agriculture is well understood; apple and peach orchards are common; butter and cheese are procured of good quality; they have slaves, good horses, and about 22,000 head of cattle. Several of them are good tradesmen, as blacksmiths, weavers, millers; and they have saw-mills, grist-mills, wagons, and other furniture of an improving community. They have a newspaper edited by one of their own people, in their own language. Numerous and flourishing villages are seen in every section of the country. They are remarkably clean and neat in their persons, and practise bathing universally. A young man solicited the hand of a young Cherokee woman: she refused his offer, and gave as a principal reason that he was not clean in his appearance; that he did not, as the Cherokees do, bathe himself in the river. They consider bathing and cleanliness in the light of a moral virtue.

The Choctaws, Chickasaws, and Creeks, have not been so much noticed as the Cherokees; but they, too, are in a satisfactory progress towards civilization. They have good orchards and corn-fields, and some of them are the owners of inns or hotels on the roads through their country, which are found, we believe, to be very comfortable places of entertainment to travellers. There are a few books in the Choctaw language; and the Creeks produce very neat articles of pottery, jars, vases, &c., and pipe-heads of black marble. Their ploughs, spinning-wheels, &c., are a further proof of their thriving condition, and the growth of economical habits.

The Indians in the northern part of the states, and along the lakes, retain much more of the idle unsettled habits of their ancestors than the southern tribes; and those of them who remain near the white settlers are little superior in appearance or character to the gipsies of Europe. Reserves of land have been set apart for them out of their former hunting-grounds, and in many cases these have been entirely surrounded by the farms and settlements of the whites, the Indians still remaining in their original patch of forest. In this state, they appear to be like animals of prey under confinement; their natural occupation is taken from them, and they seem to have no powers for any other. Their numbers are found to be smaller upon every enumeration; and their idle, uncomfortable way of living, with the disrespect which is everywhere shown them by the whites, tend greatly to prevent any spirit of union among them, or any steps to prosperity. Some few of them have settled into agricultural communities, and have built houses, churches, &c.; others have submitted for a time to the instruction of missionaries. But as this adds nothing to their respectability among their own people, who prefer a good hunter to a good mechanic, they have seldom the steadiness to persevere.

Treaty stipulations, as they are called, have been entered into between the American government and most of the Indian tribes, for the removal of the latter from the east to the west side of the Mississippi. This has been partly carried into effect, and it seems likely that the Indians will soon be removed altogether out of the states. In 1838, 25,139 Indians emigrated beyond the Mississippi, and by this the American government acquired 18,250,000 acres of land, for which was paid 3,738,000 dollars in money or in lands.

"With regard to those Indians who refuse to emigrate, it has not been deemed expedient for the government, by its own act, to partition out to them the land necessary for their support, or to decide upon the consideration to be allowed for the residue, and to direct its appropriation. This, so far as regards the general government, has been, and continues to be, the subject of conventional arrangement, in which the parties, by mutual discussion and compromise of opinion, arrive at a satisfactory result. In these arrangements, where the parties desire it, adequate tracts of land in fee, with temporary and wholesome restraints upon the right to sell, are secured to all who desire to remain."

When the Indians remove from any district, it is stipulated that the ceded territory shall be surveyed and sold, and the whole proceeds, deducting only the actual expenses, applied to the various objects connected with the removal, temporary subsistence, and permanent establishment of these Indians. No pecuniary benefit ever results to the United States from such treaties; the advantages to be derived from these arrangements are limited to the removal of the Indians from their present unsuitable residences, and to their establishment in a region where they may be prosperous, contented, and improving.

GENERAL REMARKS ON AMERICAN MANNERS.

There are perhaps some national traits which may be stated of the American generally, and which pervade all the districts: one of these is that among white people there is not that deference to rank or wealth which is reckoned their due, or at least is claimed for them as such in Europe. The demand for work-people is always so great that they are glad to get them at whatever price; and on the other hand, the men themselves feel much greater independence of their employers; while the employer, on the other hand, is much at a loss if at any time he offend the workmen. This circumstance modifies the whole intercourse between man and man, among the white inhabitants of America. Labourers, very generally sit at meat with their masters; and in families the whole establishment, masters and domestics, eat at the same table. The American working people seldom, however, bring up any of their children as house servants, which among them is reckoned a degrading employment; and if any of them submit to act in that capacity, they will still not allow themselves to be called servants, but are denominated *helps*. The name "*master*" is also disliked; and an employer is generally called *boss* in preference. In consequence of this unpleasant kind of feeling, which imposes a sense of degradation on one party, and of constraint on the other, white people are as seldom as possible sought for as house servants; these are generally blacks or mulattoes, who are not allowed anywhere in the states to eat with white men, and who therefore never think of it, nor feel hurt about it, when in service. The difficulty of getting servants, and the high rate of wages, leads every one, as far as possible, to do his own work. A gentleman of considerable property goes to market, and brings home a turkey for dinner; if he even mend his own shoes, it is not thought anywise strange. Judge Marshall (Chief-Justice) used to carry home his dinner in his hand, and no one appeared to think it unbecoming.

In their domestic manners, there are some peculiarities which may be mentioned. They live a great deal in large boarding-houses, or hotels, instead of having homes of their own; and travellers passing through the country, in stopping at any town, have frequently the opportunity of dining at the inn with a great part of the respectable persons of the place. Work-people adopt very generally the same mode of living; and there are houses in the different towns where as many as forty or fifty board and lodge together, paying at a certain rate per week a

month. Even young married people frequently live in this way for some years, not troubling themselves with a separate establishment till it be absolutely necessary for their family. Marriages are generally a great deal more early with them than in this country; a circumstance which contributes to this practice of boarding, as young people, though they have always abundant employment and subsistence, cannot till after some time accumulate sufficient for furnishing a comfortable home. We have Mr. Cobbett's authority for stating that long courtships receive no countenance from young ladies in America; females of every rank very quickly dismiss a lover who requires time to make up his mind. It may be noticed here that women everywhere receive the greatest attention, both in their families and when they have occasion to go abroad. Captain Hall, who seems at one time to doubt concerning this circumstance, says in another, "it is a rule which we saw universally attended to in America, never to think how men shall fare, till every female has been fully accommodated." As a proof that the same feeling exists among the working classes, we may mention, that in farming establishments the females are never asked to do any work out of doors.

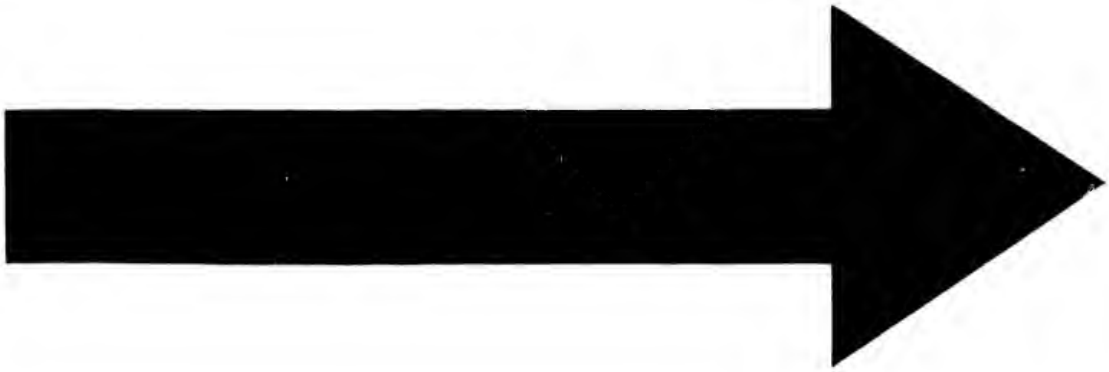
On American manners, Mr. Shirreff, in his Tour in North America, has the following remarks. "On reaching the United States, the plainness of the people's manners appeared remarkable. In all classes there was a total absence of grimace and corporeal token of respect, with corresponding sounds of address and expression of obligation or thankfulness seldom heard. But on the other hand, vulgarity, rudeness, and impudence, is almost never met with in the humblest walks of life. A general propriety of deportment and softness of manner pervades the lower classes. In America every individual seems possessed of self-respect, and, in the intercourse of life, arrogance is seldom assumed and never submitted to. The civility of all classes in the United States is so universal, that, during my intercourse with the inhabitants, I scarcely experience an indication of insolence, and never observed that democratic sauciness which I was taught to expect amongst the lower orders."

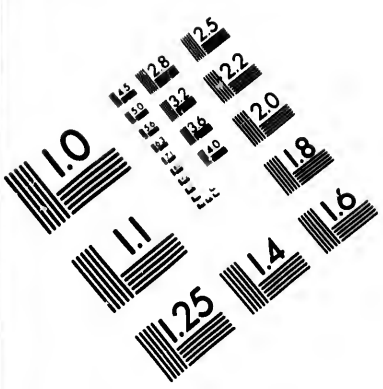
There are certain laws in the United States which have a peculiar influence on the manners of the country. It is not, for instance, allowed for a rich proprietor to leave the whole of his wealth to any one of his children; the laws direct that it shall be divided equally, or nearly so, among the whole. Hence large properties are broken down, and the aristocracy of landholders, the most important class in all other countries, have no existence in the states. As it is this class which in Europe gives the tone to a great many of the observances and even feelings of society, the want of it in America has a powerful influence in forming a set of manners different from ours; the farmers there are almost universally the proprietors of the land which they occupy, and it is seldom very extensive. They have no rents to pay, and they cultivate only the best soils; hence they have always large returns on their outlay; and though few of them acquire great fortunes, the majority are in easy circumstances. Some of the southern planters, who are the richest *class* in the United States, have incomes as high as £18,000 or £20,000 per annum; many have from £3000 to £5000, but the incomes of the majority do not probably exceed from £700 to £1500 per annum. The next class to the planters, in point of wealth, are the great merchants in the commercial cities, some of whom possess fortunes of £250,000; these, however, are not numerous. As none of these sums are, however, equal to the large fortunes which are inherited in Europe by the accumulations of several generations in one person, it is evident that there cannot exist in America those clubs of enormously wealthy individuals, who have such a powerful influence in all the affairs of the older countries. Extensive concerns and great establishments, which in other countries are supported by single individuals, are here carried on by joint-stock companies: not only is this the case with banks and canals, but with mills, steamboats, woollen, cotton, and iron manufactories. The shares in the stocks of these companies are generally small, and thus afford a ready means for mechanics, labourers, and persons of all classes, investing their savings with advantage.

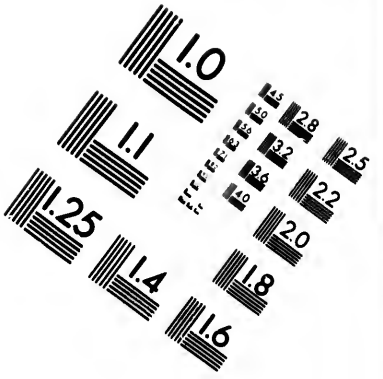
From the comfortable circumstances in which people of the middling classes generally find themselves, there are not the same restraints upon their moving from place to place, to improve their circumstances, as there are in Europe. Young persons have never the apprehension, for instance, of leaving their parents destitute, or dependent upon others, which often keep them at home with us. Married people, again, with a growing family, have generally a sufficient stock to enable them to move away with all their children, and take a long journey in whatever direction they may see a prospect of thriving. In England, where they have hardly a sufficiency from one day to another, this would be impossible; and hence the small number of working people in this country who are able to transport themselves to take advantage of the higher wages and better living of America. The journey by canal, river, and lake, to some of the back settlements there from the coast, is more expensive than that of an English family would be to Halifax, and the improvement of circumstances hardly so great; yet how few in this country, to whom this improvement would be the greatest, are able to take advantage of it! This power of shifting their place, and seeking to better themselves, has had a more peculiar effect upon the character of the Americans than any other circumstance. They have less of that superstitious attachment to one spot than is found in poorer countries, where the people cannot leave it: families think little of a journey of some hundreds, or even thousands of miles; and the numbers who are continually moving with their luggage, has made the opening of new canals and railroads to distant parts more profitable than it could have been in any other country.

RELIGION.

All forms of religion are equally favoured by the state in America, and the members of all have equal privileges. None of the clergy are paid by government, or out of public property, in any shape; they depend for their salaries entirely upon the congregations for which they officiate, and by which they are elected. The bishops, ministers, elders, or other officers, are chosen by the members of each persuasion, according to their several forms of church government, without the intervention of any other party. There are a great number of different denominations of Christians in America; the principal are the same as in this country, consisting of Catholics, Protestant Episcopalians, Presbyterians, Quakers, and the various classes of Independents. In some of the states there are certain denominations more prevalent than others. New England, for instance, was settled by the Puritans in Cromwell's time, and its religious condition bears the impress of that origin. Maryland was colonized by Roman Catholics, who are still numerous there: Pennsylvania by the Quakers or Friends; while Episcopacy prevailed in Virginia, the Carolinas, and Georgia. The first Presbyterians came from England, Scotland, and Ireland, and settled in Delaware and New Jersey. If the whole population of the states were divided into twelve parts, three of them would be Calvinists, chiefly of the Independent and Presbyterian sects; two Baptists; two Methodists; one Episcopalians and Lutherans. The rest include persons of many various forms of belief, and a considerable number who follow no religious profession.







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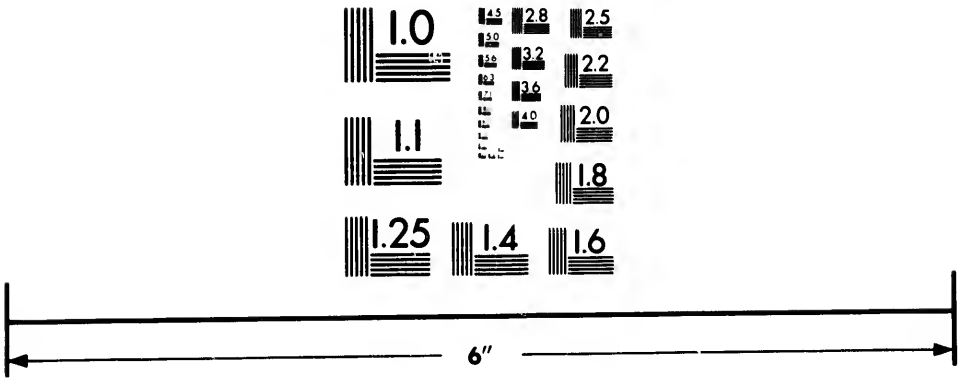

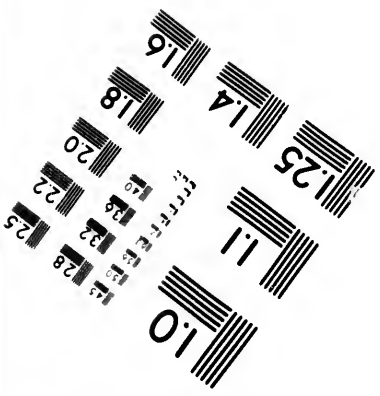

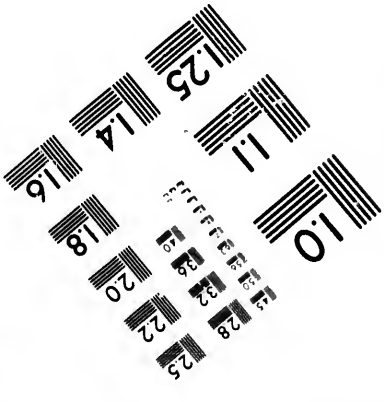

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There are about sixty colleges and seminaries for the education of young men devoted to the church, of all the different sects. In New York, it is found that there is one clergyman to every 1384 of the population; in Pennsylvania there is one to every 1123; in Kentucky, one to every 1377 of the white inhabitants. In Great Britain, the proportion is one to every 800 or 900—in Europe generally, one to every 1000. It must be recollected, however, that in America this whole number are actually employed in the ministry; there are none of them who are merely dignitaries, or who hold offices without labouring for the instruction of the people: this renders the proportion of actual religious teachers greater than at first sight it appears, when compared with the number of clergymen in European countries.

These remarks apply chiefly to the old-settled states of the east and north; and on this subject we beg to give the following extract from the work of a recent traveller of our own country, Mr. Fergusson of Woodhill:—

"The religion of the states is marked by some peculiar features. It has been too frequently disgraced by wild and extravagant fanatics, and Unitarianism has in many places made dreadful strides. Still, the conclusion to which I have come is favourable to the growth of pure and vital Christianity in the populous and civilized portion of the states. I observed, in public and in private, a decent observance of the Sabbath. The official papers of the government uniformly recognise the superintending care of a beneficent God. No shops were to be seen open on the day of sacred rest, still less were the theatres or places of public amusement; public travelling was not in general use, and the transmission of the mail on that day had been debated in the preceding session of Congress, when the question was lost, chiefly on the ground that the constitution forbade any interference by government with matters of conscience. There can be no doubt, however, that Sabbath profanation is practised in some quarters to a great extent. As regards the fruits of religion, there can be little question, that, taking them as a people, the citizens of America are virtuous and exemplary. Conjugal infidelity is extremely rare, and in more than one of the states is visited by fine and imprisonment. In the large cities, at least of the middle and northern states, vice does not stalk abroad in that disgusting form which may be said to deprive respectable females in European towns of the free enjoyment of our public spectacles and walks."

We give one more extract on this subject; it is from Mr. Stuart of Dunearn:—

"We went to attend divine service at Mr. Stebbings's church. He had gone from home, and was unavoidably detained; and the person who had promised to officiate for him failed to appear, in consequence of the morning being stormy. The congregation assembled—a pause ensued: at length Dr. Smith, one of the elders, rose, and said, that they ought not to separate without discharging those religious duties which had led them to assemble on the first day of the week. He then gave out a psalm from his own seat, and afterwards prayed. In the mean time, he had sent home one of his daughters for a volume of sermons, one of which he read. A second psalm was given out by him and sung, after which the service was concluded by a prayer from Mr. Lister, a farmer in the neighbourhood, and one of the elders—the whole without any appearance of bustle or exertion." There are a great number of religious newspapers in America, which is a further proof of the serious habits of a large part of the population.

The remarks we have here made apply exclusively to the New England states, and to the older settled districts of the east; they may also perhaps be extended to the *towns* of the newly-formed western states, in which much attention is given to religion. In the slave countries, however, this condition is altogether reversed. North Carolina, with a population of 600,000, has hardly fifty clergymen; and South Carolina, with 420,000 inhabitants, has not more than forty. In Georgia there were only ten in 1818. In Virginia, the population is about one million; the number of clergymen not one hundred. The situation of Maryland is similar.

In the countries on the Ohio, Michigan, &c., which are in progress of settlement, there are no regular churches except in towns; the only opportunity the colonists have of attending sacred ordinances being at field-meetings, or *tent-preachings*, as they would be called in Scotland, which are held in the forests, and are sometimes continued for several days. The first settlers in these districts are generally rude men, and little heedful of religious matters; but these meetings serve to keep alive among them a feeling of what is due to their character in this respect, and, as the population becomes more dense, gradually lead to the establishment of regular pastors and churches.

MEANS OF EDUCATION.

The state of the people in respect to education is very different in different parts of the states. In the old settled districts, the proportion of well-informed and well-educated people is greater than in most countries of Europe. In the slave states of the south, and in the western districts, which are as yet only occupied by a thinly-scattered population, the number who can read and write is very small in proportion to the population. Some idea of these different conditions in respect to education, may be formed from the following account of the number of students at college in the different districts in proportion to the whole inhabitants of each:—

In the eastern or free states,	1	student to	1231	inhabitants
" middle slave states.	1	"	3465	"
" southern slave states.	1	"	7232	"
" western or new states.	1	"	6060	"

There are at present ninety-five colleges in the United States, under the direction of the various religious sects.

In the New England states, it appears, by the number of young men who are thus receiving a liberal education, that there is care taken to provide instructors for the rising generation, as well as to secure respectable attainments in those who are to exercise the professions of clergymen, lawyers, medical men, engineers, &c. In the slave states there is a lamentable deficiency of all this. In the newly-settled districts it cannot of course be expected that people so thinly scattered over the wild should have regular means of education.

In the New England states the means of instruction provided for the children of the labouring classes are in general such as to put the knowledge of reading, writing, and arithmetic, within the reach of all. Every state has a public fund set apart for paying the salaries of teachers; and if this is not sufficient to provide for each township, the inhabitants are expected to make themselves to make up the deficiency. They generally elect school committees, who build school-houses, choose teachers, and apportion funds, according to the necessities of each parish. Children are entitled to attend all the seminaries without any charge but that of paying for the books which they use. In order further to secure the education of young people who may be obliged to go early to *service*, it is common in these states to stipulate *schooling as part of their wages*. This was in former times a regular condition in respect to young farm-servants in Scotland, only that here they were generally taught by the master or mistress themselves, whereas in America they are sent to school for that purpose. The result of all this is, that the number of people of the working classes who can read and write is more fully greater than in any country of Europe, not even excepting Scotland or Switzerland. The means of education are also

awanting, while the wages of the labouring classes enable them to provide books, and to maintain their children at school for a longer period than can be easily done in Europe, where their services are soon required to assist in maintaining the family. It is remarked, that, "though the number of learned and scientific characters is much smaller than in France or England, the mass of the population are better informed than in either of these countries. Reading the journals universally, and knowing a little of what is doing at home and the world generally, they betray none of that awkwardness which springs from conscious ignorance."

It must not be supposed, however, that this general account of the state of education applies equally to every district. It relates, indeed, chiefly to the great towns, and to the thickly peopled places in their neighbourhood. The remote townships, which in a country so lately occupied form a large proportion of the whole area, are frequently as much deficient in the means of instruction as in regard to religious edification; and they have indeed little anxiety to improve themselves. Many of them pay no attention to the regulations for establishing schools, and, were it left to themselves, would allow their people to remain as they are, without either reading or writing. In America, however, as in most other free countries, the well-informed portion of the community is the most active, and, like the little leaven which leavens the whole lump, it is continually at work to stir up a desire for information and light in all the dark places around it. The operations of benevolent societies have the same effect in the remote districts of America which with us they have produced in the Highlands of Scotland and elsewhere; and they are ultimately more successful, because, whenever a desire for information has been excited, the comfortable circumstances of the people enable them to go on educating themselves. In all the newly settled states, lands have been allotted for the erection of academies, and the establishment of regular district or parochial schools, according as the population increases; six hundred and forty acres are generally set apart in each township for this purpose, beside one or two entire townships in each state for university funds.

LEARNING AND THE ARTS.

America has produced several names of the highest celebrity, both in learning and the arts. Classical studies, which used to be looked on as the great test of learning, are not very extensively cultivated; but in general philology, or acquaintance with the principles of language, this country possesses several very eminent scholars—among whom we may mention Mr. Duponceau, a native of France, but naturalized in America, and celebrated for his researches into the history and affinities of the different Indian tongues. Mr. Wheaton, also, who is well known for his acquaintance with the languages and history of the north of Europe, deserves to be mentioned; and a Dictionary of the *English Language* has been published by an American scholar, Dr. Webster, which was reprinted in England, and is highly esteemed. Many American writers of the present day have attained very high fame, and their works stand side by side with the best English authors. To mention those only which are well known in Europe—there are Dr. Channing and Jonathan Edwards in divinity; Irving, celebrated both as an historian and a novelist; Bryant, a poet of high power and elegance; Cooper, whose fictitious narratives have attained a fame hardly inferior to those of Scott, and which exhibit a set of manners completely original to Europeans. It is questionable, indeed, whether there are not as great a proportion of living American writers who have attained celebrity in England, as there are of English authors of the present day whose works are read on the other side of the Atlantic. The American reviews, which often give publicity to the opinions of men of talent in that country, as ours do to those of philosophers and statesmen here, produce frequently as deep an impression as any European publications of a similar kind; and the selections which appear now and then in this country from the American periodical literature, give evidence of as high talent in the writers, and of as cultivated taste in the readers for whom it is prepared, as any thing of the same description among ourselves.

"There is in this country no class of men who can be styled authors by profession. Almost all the works which have issued from the American press have been written by men who have been engaged in some laborious profession or employment. These works have not been written under the shelter of academic bowers, or in the vicinity of large and well-furnished libraries, but under circumstances of inconvenience and embarrassment. It would therefore be unreasonable to expect that they should indicate that degree of erudition and literary culture which might be looked for under more favourable circumstances. Dr. Franklin, the greatest American philosopher, followed during most of his life the profession of a printer; and Dr. Bowditch, the most eminent American mathematician and astronomer, was, during his whole life, devoted to business relating to navigation and commerce, or finance. The most distinguished American theologians, as for example, Mather, Edwards, and Dwight, were devoted to laborious professional duties.

"Since the beginning of the present century there has been a vast increase of persons who have written for the press, and also of the number of works published." The American Almanac, from which the above is quoted, gives a list of 776 names of American writers. The same authority estimates the number of copies of newspapers circulated in the United States at 100,000,000.

In science, the reputation of Europe is so compacted of what her philosophers of former times have done, and of what is now doing by those who continue their researches, that it would be absurd to institute a comparison in this respect. It may be remarked, however, in regard to America, that she possesses men who keep pace with all the discoveries and improvements of the sciences, and who are able to canvass and examine every thing which any new train of investigation may bring to light in other countries: if we add, farther, that one of the most splendid of these original trains of investigation was devised and traced to its result—the identity of the electric fluid with lightning—by the American philosopher Franklin, we shall have said as much for the scientific fame of America, as can be arrogated to itself by any European country. Of the American journals of science, that of Dr. Silliman is well known in Europe, where it enjoys a high and well-merited celebrity. The recent growth of every thing in America has not given time as yet for the formation of those extensive museums and libraries which so much facilitate the researches of learned men in the old countries of Europe; and as the legislature has not power to vote money for these objects, it may be a considerable time before any thing is witnessed there like the splendid national collections of Paris, London, and Rome. There are, however, several museums: as, for instance, those at Salem, Boston, and Philadelphia, whose fame will gradually accelerate their own increase, and may at last attract national attention to the subject. There is no public astronomical observatory in the states, and the expense would be too great for any private means.

In mechanical science, which is the absorbing pursuit of the present day, the Americans have been no whit behind other nations in devising means for facilitating and abridging such processes of labour as are carried on in their own country. Steam navigation, though certainly first discovered in Scotland by Mr. Taylor, was as certainly first brought to a useful and

practical result in America by Mr. Fulton. The machine which was contrived by an American for separating cotton from the seed—that for distilling salt water, or procuring sweet water at sea, by separating it from the salt—some contrivances for abridging the manufacture of iron-work—and many others adapted to the peculiar circumstances of their country—show the Americans to be equally ingenious, and equally acquainted with the resources of mechanical invention, as the English or any other nation.

The science of the Americans, as we have seen, has also been displayed in a very remarkable and useful manner, in the construction of several large canals and railways, some of which are hardly to be equalled in any other country. The same skill is exhibited in improving the navigation of their rivers, in constructing bridges, in architecture, and in ship-building.

FUTURE PROSPECTS OF THE UNITED STATES.

From the rapidity with which the population of the states has hitherto increased, and is diffusing itself over the wide and fertile continent of which it is in possession, the most magnificent anticipations are formed by the Americans of the future greatness of their nation. "Let us assume," say they, "what appears highly probable, that the people of the United States will ultimately spread themselves over the whole North American continent west of the Mississippi, between the parallels 30° and 49°, as far as the Pacific Ocean. This will be found to add 1,800,000 square miles to the territory east of the Mississippi, and, putting both together, the area of the United States, thus enlarged, will be 2,700,000 square miles. A surface of such extent, if peopled to the density of Massachusetts, would contain two hundred millions; or if peopled to the density of Great Britain and Ireland, four hundred and thirty millions. If the population of the United States continue to multiply in the same proportion as hitherto, it is demonstrable that the two hundred millions, necessary to people this vast territory, will be produced within a century." These are indeed magnificent anticipations, and we know no reason why they should not be realized. But we must remark, that, whatever they may add to the national greatness of the American name, they are by no means likely to be favourable in the same degree to the individual comfort of the members of its population. It cannot be doubted but that the high rates of wages and profits, and the rapidity with which capital now accumulates in that country, are partly owing to the large tracts of fertile and easily accessible land, which are always at the disposal of its inhabitants. Were the government weak, ignorant, or partial, these unoccupied territories might exist, as they do in many other countries of the world, without being of advantage to any one. In America, the qualities of the government render them easily available, as long as they last; but nothing can renew the same advantage after it has once been expended. As those splendid prospects, in which the Americans are fond of indulging, approach to realization, the quantities of new land will be daily growing less—the rapidity with which capital now accumulates will be diminishing in the same proportion—the wages of industry will gradually fall off—and as the nation becomes greater and more powerful, in the same degree will the resources of its individual population be lessened. But the truth is, these fancies concerning the rapid increase of population, and the filling of the whole American continent with a nation of unparalleled power, "greater than the sands of the sea in multitude," are mere playthings of the imagination. Too little is known of the real numerical progress of population to enable us to say any thing on the subject; and certainly it is not the circumstance that their immense and fertile country *will one day be fully occupied*, which ought to be a subject of satisfaction or pride to the Americans, however powerful the nation might then be, but rather that their gigantic population has rich fields and abundant pasture in which to carry on its increase for many ages. During this time, it may set an example of equal government and peaceful industry to the rest of the world, which, unhappily, has been hitherto wanting; and by the reception of just principles on the influential part of the old continent, the new nations of the west may be the means of redeeming it from many oppressions. When these are removed, it will be seen, that, in our world too, there is not wanting abundance of unoccupied and rich land; whole kingdoms and provinces of Europe, Asia, and Africa, are at present shut up from industry by one kind of barbarism or other, and the example of America may yet enable mankind to enjoy the advantages of their fertility.

DESCRIPTION OF SOUTH AMERICA.

The southern portion of the American continent is a peninsula of a triangular form, extending from north latitude 12° to south latitude 52° 30′, or, including the Archipelago of Terra del Fuego, to 56°, the small island called Cape Horn, situated in that parallel, being generally reckoned as the most southerly point of South America. In longitude, it extends from 35° to 80° west from Greenwich. It is connected with North America by the Isthmus of Panama. On the south and west it is washed by the Pacific Ocean, on the north by the North Atlantic, and on the east by the South Atlantic Ocean. Its greatest length, from north to south, is 4600 miles; its greatest breadth, from Cape St. Roque in Brazil, to Cape Blanco in Peru, latitude 4° south, is 3500 miles; and it has a superficial area of about 7,000,000 square English miles. As mentioned in the article MARITIME DISCOVERY, the West India Islands were discovered by Columbus in 1492, and the adjacent continent of South America in 1498. In the following year the coast of Brazil was discovered; after which [illegible] various parts of the continent were visited by different navigators, and the discovery of the whole maritime territory was effected in about five and twenty years.

GENERAL ASPECT.

South America may be said to be separated into two portions by the hand of nature, which has raised the huge chain of mountains, *or cordilleras*—the Andes—which run from the Straits of Magellan to the Isthmus of Darien, parallel to the shores of the Pacific. Nature may also be said to have separated it into five distinct regions:—1. The low flat country lying between the foot of the Andes and the Pacific Ocean, averaging from thirty to a hundred and fifty miles in breadth. 2. The valley of the Orinoco, enclosed by the Andes and their branches, consisting of huge plains, or steppes

called by the natives *llanos*. The heat is so intense in these plains during the summer, that the ground is split into great rents or fissures. 3. The basin of the Amazon, or Maranon, which embraces nearly a third of the whole continent, or above 2,000,000 of square miles, and the soil of which is everywhere densely covered with vegetation. 4. The great plain of the Rio de la Plata and its tributaries, consisting of numerous varieties of soil and climate. 5. The elevated country of Brazil, very woody towards the Atlantic, and opening into fertile plains in the interior.

Every thing in South America is upon a grand scale. The mountains, the rivers, the forests, the plains—every feature of nature, in short, is characterized by magnificence and sublimity, and calculated to excite alternately admiration and wonder. In one point are seen mountain-summits above the clouds, white with snows that never melt, while their bases rear the banana and pine-apple. In other places are to be seen ever-living volcanoes, throwing out flames, smoke, ashes, and stones. Then, again, we have vast and dark forests, which never yet rang to the woodman's axe, where vegetation prevails in its most gigantic forms. "In the interior of the new continent," says Humboldt, "we almost accustomed ourselves to regard men as not being essential to the order of nature. The earth is loaded with plants, and nothing impedes their development. An immense layer of free mould manifests the uninterrupted action of organic powers. The crocodiles and the boas are masters of the river; the jaguar, the *peccari*, the *dante*, and the monkeys, traverse the forest without fear and without danger; there they dwell as in an ancient inheritance. This aspect of animated nature, in which man is nothing, has something in it strange and sad. To this we reconcile ourselves with difficulty on the ocean, and amid the sands of Africa; though in these scenes, where nothing recalls to mind our fields, our woods, and our streams, we are less astonished at the vast solitude through which we pass. Here, in a fertile country, adorned with eternal verdure, we seek in vain the traces of the power of man; we seem to be transported into a world different from that which gave us birth."

The Andes derive their name from the Peruvian word *anti*, signifying copper. They stretch, as we have said, throughout the entire length of South America and the Isthmus of Darien, and are, indeed, prolonged into North America, traversing Mexico and the United States as far as the shores of the Polar Sea. The southern Andes vary very much in breadth. Near Potosi and lake Titicaca (in Bolivia) the chain is 180 miles broad. The loftiest, which are near Quito, under the equator, were, until the height of the Himalaya was ascertained, always accounted the loftiest in the globe. The Pico de Illimani, first peak, is 24,450 feet in height; the second peak of the same 24,200 feet; Sorata 25,000 feet; Chimborazo 21,440 feet; Cotopaxi 18,890 feet; and Potosi 16,000 feet above the ocean level. All these are in Peru and Bolivia, and they are the loftiest mountains in South America. When Humboldt crossed the Andes, he passed through a deep forest, which took him about twelve days to traverse, during all which time not the slightest trace of man was to be seen. The pass over the ridge was not more than from one to two feet broad, and resembled a hollow gallery open to the sky. The Quebradas are immense rents, dividing the mass of the Andes, and breaking the continuity of the chain which they traverse. Mountains of great size might be swallowed up in those almost fathomless ravines, at the bottom of which only the astonished traveller can judge of the awful magnificence of the mountains

In no one respect is South America more distinguished than in the number and magnitude of her rivers, some of which might with propriety be described as *running oceans*. Of these the Amazon, or Maranon, claims the first rank. For a space of 22°, in a direct meridional distance, not a single stream descends the eastern side of the Andes, but what contributes to swell the ocean-flood of this river, which, for length of course and volume of water, has no parallel in the world. The main trunk is composed of several very large streams, its chief effluents being derived from the south. First is the Huallaga, whose source may be traced to the neighbourhood of Lima, not far from those of the Maranon itself. The next is the Ucayale, a river not inferior to the Maranon at its junction, and sometimes held to be the true Maranon. The Purus, or Cuchivara, is also a river of the first class; but the most celebrated of these tributaries is the Madera, formed from the Beni, the Marmore, and the Itenes. The Rio Negro, which comes in from the north, is likewise a very large stream. Having said this, we must refer the reader to the map for a description of its onward course to the ocean. The total navigable course of the Maranon is calculated at upwards of 3000 miles in a direct line; but the length of its course is estimated at 4095 miles. Ships of 500 tons burden might ascend it for 2500 miles, while many of its tributaries are equally navigable almost to their source. More than one-half, indeed, of this vast continent might enjoy a maritime shore from these numberless streams, any of which would spread commerce and civilization through a widely extended empire. The territory watered by the chief stream and its branches is at least equal in extent to continental Europe, and may be stated at 2,177,000 English miles. There are no sand-banks, nor shelving rocks, nor ice at any time of the year, to impede navigation; and so strong an easterly wind blows constantly from the Atlantic, as to carry up vessels against the tide. Yet, notwithstanding all these advantages, the mighty Maranon rolls on its course through regions unknown to industry or civilization. Throughout its whole course it is studded with large and fertile islands, from five, ten, twenty, to a hundred leagues in circumference. The waters of this mighty stream, and those of its tributaries, are stored with an infinite variety of fish of the most delicious kinds.

The La Plata, Plate, or Silver River, is next in magnitude to the Amazon. It is composed of three principal streams, the Parana, the Paraguay, and the Uruguay, and receives all the waters that flow from the eastern declivity of the Chilian Andes, and from the southern, south-western, and western faces of the Brazilian mountains. The three principal streams, with their tributaries, offer facilities for inland navigation little inferior to the Amazon itself. The estuary of the La Plata is broader than the British Channel. The length of its course is estimated at 2430 miles, and the area of its basin at 1,240,000 miles.

The Orinoco is the third largest river in South America, but much inferior to the two above mentioned Through a direct course of about 1200 British miles, it receives all the streams that water the Caraccas and New Granada, with the exception of the coast rivers. It was only about fifty years ago that there was discovered a communication between this river and the Amazon, by means of the Rio Negro. Humboldt, who has since explored these rivers, has accurately laid down the previous courses and junction of the Rio Negro and the Orinoco. In one part of their course they flow along a level plateau, which has little or no declivity; their branching waters meet and mingle in a sort of basin; and when thus united, they form what is called the natural canal of Cassiquiare. There are several cataracts and rapids on the Orinoco, described by Humboldt as splendid in the extreme. There are some other very large streams in South America, particularly in Brazil; these will be noticed when we treat of the individual countries in which they occur. There are likewise some large lakes, which will be described in the same manner

CLIMATE AND VEGETATION.

A country embracing so many degrees of latitude and elevation, possesses of course equally diversified degrees of climate. "The three zones of temperature which originate in America," says Malte Brun, "and form the enormous difference of level between the various regions, cannot by any means be compared with the zones which result from a difference of latitude. The agreeable, the salutary vicissitudes of the seasons, are wanting in those regions that are here distinguished by the denominations of *frigid*, *temperate*, *hot*, or *torrid*. In the frigid zone it is not the intensity but the continuance of the cold—the absence of all vivid heat—the constant humidity of a foggy atmosphere—that arrests the growth of the great vegetable productions, and, in man, perpetuates those diseases that arise from checked perspiration. The hot zone of these places does not experience excessive heat; but it is a continuance of the heat, together with exhalations from a marshy soil, and the miasmata of an immense mass of vegetable putrefaction, added to the effects of an extreme humidity, that produces fevers of a more or less destructive nature, and spreads through the whole animal and vegetable world the agitation of an exuberant but deranged vital principle. The temperate zone, by possessing only a moderate and constant warmth, like that of a hot-house, excludes from its limits both the animals and vegetables that delight in the extremes of heat and cold, and produces its own peculiar plants, which can neither grow above its limits, nor descend below them. Its temperature, which does not brace the constitution of its constant inhabitants, acts like spring on the diseases of hot regions, and like summer on those of the frozen regions. Accordingly, a mere journey from the summit of the Andes to the level of the sea, or *vice versâ*, proves an important medical agent, which is sufficient to produce the most astonishing changes in the human body. But living constantly in either one or the other of these zones, must enervate both the mind and the body by its monotonous tranquillity. The summer, the spring, and the winter, are here seated on three distinct thrones, which they never quit, and are constantly surrounded by the attributes of their power. Vegetation presents a greater number of gradations, of which it becomes necessary to point out the principal.

"In the region of the palms, next the sea, the natives cultivate the banana, jatropha, maize, and cocoa. Europeans have introduced the sugar-cane and indigo plant. After passing the level of 3100 feet, all these plants become rare, and only prosper in particular situations. It is thus that the sugar-cane grows even at the height of 7500 feet. Coffee and cotton extend across both of these regions. The cultivation of wheat commences at 3000 feet; but its growth is not completely established lower than 1500 feet above this line. Barley is the most vigorous, from a height of 4800 to 6000 feet. One year with another, it produces 25 or 30 grains for 1. Above 5400 feet, the fruit of the banana does not easily ripen; but the plant is still met with, although in a feeble condition, 2400 feet higher. The region comprehended between 4920 and 5160 feet is also the one which principally abounds with the cocoa, or *Erythoxylum Peruvianum*, a few leaves of which, mixed with quicklime, support the Peruvian Indian in his longest journeys through the Cordillera. It is at the elevation of 6000 and 9000 feet, that the *Chenopodium quinoa* and the various grains of Europe are principally cultivated: their cultivation is greatly favoured by the extensive plateaus that exist in the Cordillera of the Andes, the soil of which being of smooth surface, and requiring little labour, resembles the bottom of ancient lakes. At the height of 9600 or 10,200 feet, frost and hail often destroy the crops of wheat. Indian corn is scarcely any longer cultivated above the elevation of 7200 feet; 1000 feet higher and the potato is produced; but it ceases at 12,600 feet. At about 10,200 feet barley no longer grows, and rye only is sown, although even this grain suffers from a want of heat. Above 11,040 feet all culture and garden ing cease; and man dwells in the midst of numerous flocks of lamas, sheep, and oxen, which, wandering from each other, are sometimes lost in the region of perpetual snow."

ANIMAL KINGDOM.

The multitude and diversity of its zoological riches harmonizes with the other magnificent characteristics of South America. Among the quadruped beasts of prey, the jaguars are the most formidable, being of enormous size. They generally frequent the impenetrable jungles that skirt the banks of the larger streams; and Humboldt, who explored the Orinoco and many of its tributaries, had many narrow escapes from them. The natives, however, attack them fearlessly, receiving them, when they spring, upon the point of a pike; a manœuvre in which they seldom fail. Pumas, a small species of lion, ocelots, and long-tailed tiger-cats, are common. Bears appear to be unknown, and the largest wild animals appear to be the tapira. Deers and antelopes are sparingly scattered; in which respect South America offers a singular contrast to the opposite continent of Africa. Monkeys, squirrels, and some other inferior quadrupeds abound. Of domestic animals the list is scanty. The horse and mule, originally brought by the Spaniards from the old world, are the most universally used in the new, where they have multiplied prodigiously. The immense herds of wild oxen which swarm over the pampas of Buenos Ayres, are well known; these are also of European descent. The guanaco, llama, alpaco, and vicuna, animals closely allied to the camel of Africa, are found in abundance on the Andes of Peru, Bolivia, and Chili. These were the only ruminating animals found in America on its discovery by the Spaniards. They are not only valuable as beasts of burden, but on account of their rich fleeces. The ornithology of South America is celebrated for its variety and splendour, but we cannot enter into details. Nor is it necessary to occupy space with descriptions of its reptiles, insects, and fishes. The forests abound with the two former, and the rivers and seas with the latter.

EARTHQUAKES AND VOLCANOES.

Of the whole of the active volcanoes known to exist in the world, by far the greater number are scattered along that range of mountains which has been described as extending, under the name of the Andes, from the south to the north extremity of South America, and thence passing along the Isthmus of Panama into North America, everywhere keeping near the shore of the Pacific Ocean. South America is therefore eminently a volcanic region. From the 46th degree of latitude, northward to the 27th, there is an uninterrupted line of active volcanoes; farther to the north, in Peru and Quito, they are less numerous, but very lofty and conspicuous. The volcanoes of Chili rise through granitic mountains; that of Villarica, which is so high as to be distinguished at the distance of 150 miles, burns without intermission. In Quito there are some above 16,000 feet in height, as Antisana, Cotopaxi, and Tunguragua, all of which frequently emit flames. As a necessary consequence of so much volcanic action, the region of the Andes is remarkable for frequent earthquakes. In Peru, scarcely a week passes without some slight tremor of the surface being felt. In Chili, it is seldom that a year is unmarked by some considerable shock. About once a century, or oftener, a tremendous earthquake shakes the greater part of the Andean region, destroying cities and towns, and producing extensive changes of the earth's surface. One of the most destructive in modern times was that which

occurred at Caraccas in 1812, when about 20,000 people in the city and surrounding district (16,000 of whom belonged to the city alone) were destroyed, being swallowed up by the rending of the earth, or buried beneath the ruins occasioned by the shock. One remarkable result of these great convulsions is an elevation of the land. In consequence of the great earthquake in Chili in 1821, the land was raised several feet along a space of a thousand miles, the sea receding from it accordingly, and leaving dry an extensive tract formerly covered by the ocean. Similar raised beaches are to be traced at various elevations along the slope between the sea and the Andes, showing that phenomena of the same kind must have taken place at different distances of time. Indeed, it is now the belief of geologists that the whole of the continent of South America has been raised out of the sea at a comparatively recent period; and it is ascertained that a sinking of it to the extent of only five hundred feet would again submerge the greater part. Humboldt is of opinion that the Andean volcanoes are but the spiracles of an immense *volcanic vault*, extending under the surface of this part of the globe, and part of which is covered by the bed of the Pacific. The connection of the volcanoes of Pasto in New Grenada with the volcanoes of Quito, was strikingly displayed in 1797. A column of black smoke had continued for several months to issue from the former, but it suddenly disappeared on the 4th February of the same year, at the precise moment when, at sixty-five leagues from the city of Pasto, the city of Riobamba, near Tunguragua, was swallowed up by an earthquake. This eruption was of a very extraordinary nature. An enormous area of ground rolled backwards and forwards, like the sea, for four minutes, during which time every town on its undulating surface was levelled with the ground, and the cities of Riobamba and Quero were buried under the ruins of the impending mountains. Tunguragua was rent asunder and vomited a sea of mud, covering the valleys to the depth of 600 feet.

NATIVES.

The question respecting the origin of the native population of both continents of America, seems to have been settled by the discovery of Behring's Straits, and there is now scarcely a doubt entertained of their descent being Asiatic. There are, throughout most parts of the interior of South America, innumerable hordes of Indians still living in a savage and primitive state. Of the general features of these people it would be in vain to attempt an enumeration here, as they are divided into thousands of small tribes, or *nations* as they call themselves, all distinguished by their own peculiar characteristics. Many of them, such as the Chilians and Peruvians—and of the former, the Araucanians more especially—were certainly marked, from the earliest period of their discovery by Europeans, by many of the finest and noblest traits of human nature while in an unenlightened state—hospitable, faithful, social, peaceful, and affectionate; while those in other parts of the immense continent were conspicuous, as many of them indeed still are, for all the cruel, deceitful, bloody, and barbarous features displayed by the most savage nations.

SUBJUGATION OF THE COUNTRY BY EUROPEANS.

After the discovery of Brazil by the Portuguese in 1499, the country was taken possession of in the name of the sovereign of Portugal. In 1531, it was divided into captaincies, and granted to such persons as were willing to undertake their settlement. But these lords possessors abused their powers, and a governor-general was appointed, with full authority, civil and criminal. The first individual selected for this high office entered upon the duties of it in the year 1549. The Pacific Ocean was discovered in 1512 by Nunez de Balboa, governor of Darien, which a few years before had been colonized by the Spaniards. In 1524, the famous, or infamous, Francisco Pizarro landed in Peru, which he found in a partially civilized state, and governed by a race of princes named incas. In a few years he completely subjugated this simple, and, in many respects, amiable people. The treachery, cruelty, and perfidy, by which he effected his object, have rendered his name odious to mankind; but into details we cannot enter. An army was despatched from Peru for the conquest of Chili, but this proved a very difficult undertaking, on account of the indomitable courage of the natives. Of all the aboriginal nations of America, the Promaucian and Araucanian tribes of Chili possessed the highest degree of intelligence, energy of character, and warlike prowess. To keep even a partial possession of Chili cost the Spaniards more blood and treasure than all their other settlements put together. The Araucanians, indeed, maintained their independence for three centuries, in spite of all the efforts of Spain to subdue them. Only a part of the country submitted to the Spaniards, and cities were there erected and local governors appointed, but still frequent hostilities mark the history of this portion of South America, down to the period when, along with the rest of the continent, it achieved its independence.

That large tract of country situated at the north-east base of the continent, and which for some time bore the name of Colombia, was explored at a very early period, and settled by the Spaniards. The natives, however, showed something of the spirit of the Chilenos, and were only subdued with difficulty. The territory of New Granada was formed into a government in 1547, and Venezuela in 1550. Quito depended on the government of Peru till 1564, when it was constituted a presidency. These three territories underwent repeated changes, but finally became known under the names of the captain generalship of Caraccas (Venezuela), the viceroyalty of New Granada, and the presidency of Quito. Guiana was settled in 1550 by some French Protestants, who had fled thither as to an asylum from the persecution of the League. The Dutch settled Berbice in 1626; Essequibo in 1698; and Demerara somewhat later. The history of the ill-fated colony of Darien, established by the Scotch at the close of the seventeenth century, is well known. The country situated on the shores of the Rio de la Plata remains to be noticed. A considerable part of the river having been explored by Sebastian Cabot in 1526, the region was taken possession of for the Spanish crown. Buenos Ayres (*good airs*) was founded in 1535, but soon after destroyed by the natives. It was rebuilt, but a second time reduced to ruins by the savages; and not until 1580 did the Spaniards succeed in their object of erecting a city on this spot. In the meanwhile Paraguay had been colonized, and the country conquered as far as Potosi. The permanent settlement of the Spaniards here was greatly facilitated by the Jesuits, who founded those celebrated communities called *reductions*, or missions, in which they made strenuous efforts to civilize the natives, and bring them within the pale of Christianity.

CONDITION OF SOUTH AMERICA UNDER THE SPANIARDS

The power of Spain and Portugal having been firmly established over the greater part of the South American continent, such methods of government were adopted as seemed best calculated to secure the allegiance of these territories to the mother countries. That the measures to which the Europeans had recourse for this purpose were tyrannical and most oppressive to the natives, may be taken for granted. We shall, in the first place, treat of the Spanish dominions, leaving Brazil to be noticed afterwards. The whole of the Spanish possessions in the new world were originally divided into two immense governments, one subject to the viceroy of Mexico, and

the other to the viceroy of Peru. But these were of too unwieldy a size to be properly managed; so that about the middle of the eighteenth century, they were distributed into nine distinct governments, all constructed on the same plan, and independent of one another. Five of these belonged to South America; three of the first rank being viceroyalties; namely, Peru, La Plata, and New Granada; and two being captain-generalships, Chili, and Venezuela, or Caraccas. By this arrangement, Quito was incorporated with New Granada; but, as has already been noticed, it assumed a distinct and independent form, which it maintained until the revolution. The government was vested in the viceroy or captain-general, who was held to represent the king, with all the prerogatives attached to the regal character. The royal *audiencas*, or supreme courts, consisting of Spaniards nominated by the crown, enjoyed extensive judicial powers—as also did the municipalities and corporations:—but perhaps the clergy possessed more influence than any. All these contributed to modify the otherwise unlimited powers of the head of the government. Considerable security and many privileges were enjoyed by all classes, excepting the miserable Indians, who were treated little better than beasts of burden. They were at first slaves, paying a capitation tax to the crown; and although modifications took place in the system, they were never released from vassalage till the period of the Revolution. For, although laws were made by the home government from time to time for their protection, they were never acted upon; and as the only object of the government was to raise a large revenue from the colonists (whom they taxed to the uttermost), no notice was ever taken of this disregard of the laws. The Creole, or American-born Spaniards, were excluded from all public offices, from the highest to the lowest, all of which were bestowed on the natives of Spain. These functionaries, whose sole object was to make money, acted the part of true despots towards the other classes; plundering, taxing, and exacting, without the slightest regard to mercy or justice. Men rose to affluence in offices without salaries, and the priests rivalled the laymen in the art of extracting money from the natives. In a word, the Creoles were little better situated than the miserable Indians. All books of general knowledge or information were prohibited from being imported; schools of every kind discouraged; while the priests filled the minds of the natives with the most childish superstitions and religious terrors. Even to visit foreign countries was generally forbidden to the people.

Amongst other deeds of darkness which were brought to light by that remarkable document, the manifesto put forth by the congress of Buenos Ayres, at the time of the revolution, we find it stated that "every thing was disposed on the part of Spain, in America, to effect the degradation of her sons. It did not suit the policy of Spain that sages should rise up amongst us; fearful lest men of genius should remind them of advancing the condition of their country, and of improving the morals and excellent capacities with which its sons have been gifted by their Creator. It was her policy incessantly to diminish and depress our population, lest one day we should imagine aught against her dominion, guarded by a force too contemptible for keeping in subjection regions so various and vast. Commerce was exclusively confined to herself, from a mean suspicion that opulence would make us proud, and render us capable of aspiring to free ourselves from so many vexations. The growth of industry was checked, in order that the means of escaping from our wretchedness and poverty might be denied us; and we were excluded from all participation in public employments, in order that the natives of the peninsula might have entire influence over the country, so as to form the inclinations and habits necessary for retaining us in a state of dependence, that would no longer permit us to think nor act but in conformity to the modes dictated by the Spaniards."

We must here find a place for the description of two distinct features of the tyranny exercised over the aborigines of Peru. These were the *mita* and *repartimiento*. The former was a civil conscription, by which the population of every district was compelled to furnish annually a certain number of labourers for the service of the proprietors of the lands or mines. Under the most favourable circumstances, we are told, scarcely one Indian out of five survived the first year of his unwholesome and exhausting labours in the mines, to which he had been dragged from home and kindred, it might be many hundred miles away. It is asserted by several Spanish authorities, and surely they are to be credited, that the effect of working in the mines was to reduce the population of some districts to one-half, and of others to one-third, of what it was in 1581. It is computed that upwards of 8,000,000 of men perished in the mines of Peru alone. This estimate is very probably exaggerated, for there were several other causes which contributed to thin the population, such as small-pox, and other diseases, and the intemperate use of ardent spirits, the mortality arising from which might be ascribed to the operation of the *mita*. But such a statement being made by the Spaniards themselves is a sufficient proof of the horrible nature of this conscription. The other grievance, called the *repartimiento*, was a privilege originally granted to the corregidors or governors of districts, empowering them to furnish to the Indians, at a fair price, articles of necessary consumption. In course of time, this privilege degenerated into a compulsory and oppressive exaction. Not only were the Indians compelled to purchase the most worthless commodities at an enormous price, but articles for which they had no use were forced upon them. For instance, razors for men without beards; furs and velvets for people who lived within the tropics; silk stockings for Indians who went barefoot at all seasons; and spectacles for those whose strength of vision was proverbial. Even luxuries, the very use of which was unknown to them, formed part of the supplies which they were compelled to purchase. Such is a brief outline of the system by which Spain continued for three centuries to sacrifice the interests and degrade the nature of many millions of human beings.

Long before the great revolt of the American provinces of Spain, partial attempts to shake off her oppressive yoke were made in several of the provinces; and we have seen that it was never very securely imposed upon the warlike natives of Chili. The most remarkable of these efforts to achieve independence was that made by Tupac Amaru, in the year 1780. He claimed to be a descendant of the last inca of Peru, who was beheaded in 1562; and to give eclat to the cause, he assumed not only the name of his ancestor (which means *the highly endowed*), but the style and pomp of the incas. The immediate cause of the revolt was the shameful avarice of the corregidors of some districts, who imposed upon the Indians more repartimientos than the law gave the authorities power to inflict on them. At first it wore a very serious aspect, but was ultimately suppressed, after one-third of the whole population of Peru had perished by violence. An attempt at revolution was made in Venezuela in 1797, and another in 1806, both without success. But events were taking place on the continent of Europe, which, singularly enough, were completely to change the destinies of South America.

THE WAR OF INDEPENDENCE.

It is a remarkable fact, that the first revolutionary movement originated not in a spirit of resistance to the powers by which America was oppressed, but in a spirit of enthusiastic loyalty to the imbecile Ferdinand, the

sovereign ruler of Spain and the Indies. When this monarch was deposed and imprisoned by Napoleon, and the conqueror's brother Joseph was placed on the throne, orders were despatched to the colonies to demand their submission to the new dynasty. But they refused to transfer their allegiance from Ferdinand "the beloved" to a usurper, although he was the brother of Napoleon, who had then just reached the zenith of his power. In this the Americans showed a great and commendable spirit of independence—it was a good omen of what should soon take place. On the 15th of July, 1808, the people of Caraccas took the lead in proclaiming Ferdinand VII., the captain-general and audiencia being compelled to give way to popular feeling, and a solemn oath of allegiance to the legitimate monarch was taken by acclamation. By an ancient decree it was provided, that, in cases of emergency, the convocation of cortes or general juntas, in the respective kingdoms of Spanish America, might take place. Here, then, was an emergency as momentous as any that could possibly occur. They were about to be transferred from their legitimate monarch to the ruler of France, as if they had no voice in the matter whatever, and this they would not tolerate. The exercise of the right legally and constitutionally vested in these juntas seemed the best means of saving the colonies from the yoke of France. Yet such was the singular state of affairs at the time, that this demonstration of attachment to the lawful sovereign proved the signal for the declaration of hostilities by Spain, and the commencement of a war of extermination. But how could it be otherwise? Napoleon was now omnipotent in the mother country, and the loss of any of her colonies, which their standing out for Ferdinand must have virtually been, was not likely to be tolerated. So that instructions to the powers in the colonies to suppress any demonstration of the kind, followed as a necessary consequence of the position of the Spanish crown, and the affairs in the peninsula at the time. But a flame was kindled which was not to be quenched even at the fiat of a Napoleon. We are far, however, from thinking that ardent attachment to legitimacy was the sole or even the leading motive which determined the simultaneous movement which took place throughout the whole of Spanish America. It was the ostensible ground for the formation of juntas, but entire independence was clearly the ultimate aim of thousands, who were content at first to mask their operations with this disguise. In Caraccas, the supreme junta assembled on the 19th of April, 1809, and one of its first acts was to banish the captain-general and the members of the audiencia. Juntas of government were convened at La Paz, in Upper Peru, on the 15th of July in the same year; at Quito, on the 19th of August following; at Santa Fe de Bogota on the 25th of May, 1810; at Buenos Ayres on the same day; and at Santiago of Chili on the 18th September.

Buenos Ayres has been called the cradle of South American independence; yet at the period of the first British invasion of that city, Spain had nowhere more loyal subjects. But many of the inhabitants had grown rich by trade, and enlightened views had become disseminated among them, so that, although they displayed equal zeal with the other colonies in the cause of Ferdinand, they did not long conceal their design of ultimately erecting the standard of independence. Attempts were made to foist upon them a lopped-off scion of the royal stock of Portugal, but this scheme proved abortive. After some political squabbling, Cisneros, the viceroy, was deposed, and banished from the country along with the oidores. The junta, consisting of nine individuals, among whom were some very able men, now made no secret of their intentions. The people acquiesced, and thus, without bloodshed, a complete revolution was effected in Buenos Ayres. The city soon felt itself powerful enough to proselytize in the distant provinces of the viceroyalty, where some royalist generals had collected bodies of troops, declared against the revolution, and taken measures for putting the question to the arbitration of the sword. The army of the republic was intrusted to Balcarce, and its first campaign proved completely successful. Cordova, a city of the interior, attempted to change the course of events, but all opposition in this quarter was speedily suppressed. On the 27th of October and 7th of November, 1810, the royalists were defeated at two different places on the distant frontiers of the viceroyalty. These successes gave Balcarce possession of the country as far as the Bridge of the Incas, near the great lake of Titicaca; and on the 25th of May, 1811, the first anniversary of independence was celebrated on its shores, amid the ruins of the ancient incarial palace, 2000 miles distant from Buenos Ayres. Meanwhile Castelli, a man of great talents, but most reckless temper, had joined Balcarce, having been sent to act in concert with him, and to assume the governorship of Upper Peru. But while the cruelties of this chief struck terror and dismay to the hearts of the Spaniards, his dissoluteness and want of attention to the affairs of the provinces, alienated the affections of the inhabitants of Upper Peru from their deliverers, and the common cause of both. This gave opportunity for Abascal, viceroy of Peru, striking a powerful blow in the cause of royalty. An army of 4000 men was speedily organized, and placed under the command of General Goyeneche. An armistice had been concluded between the contending armies; but in violation of this transaction (by no means an uncommon feature of the war of independence), the Spanish commander attacked the patriots at Husqui on the 20th of June, 1811. They were equally matched in point of numbers; but Balcarce was completely defeated, and compelled to retreat 700 miles from the scene of action. Great cruelties were perpetrated by the Spanish general in Upper Peru, in spite of much resistance on the part of the patriots, who assembled in considerable numbers, and sought an asylum among the neighbouring mountains. The history of Buenos Ayres becomes now closely interwoven with that of Upper Peru. Indeed, the transactions which took place throughout the whole of the governments, are intimately blended with one another. A principle of mutual assistance was acted upon, and armies successful in one place marched many hundred miles to the assistance of their fellow-patriots, who were hardly pressed by the Spaniards in another. Thus the troops of different provinces, or republics, as they soon were designated, became mixed together, and Buenos Ayreans, Chilinos, Bolivians, Peruvians, and Colombians, fought side by side on the same field. This friendly co-operation among the republicans greatly contributed to their success; the struggle might otherwise have been protracted in many places, till a period long subsequent to that when the Spaniards were finally expelled from South America.

We have already had occasion to notice the valour and patriotism of the natives of Chili, so that the reader is probably prepared for a speedy overthrow of the Spanish power in that quarter; but events often take a very different course from what they at first promise, and from what is anticipated. The first revolutionary movements, indeed, were here accomplished without difficulty or violence, being greatly facilitated by a commissioner sent from Buenos Ayres. The Spanish governor was deposed; a junta was formed on the 18th September, 1810, still, however, acknowledging the supremacy of Spain; and in spite of attempts to upset the new government, a congress met in June, 1811, when many wise measures were adopted. Reforms in civil and ecclesiastical establishments were projected; freedom of commerce and of the press was declared; and this was the first legislature in South America which adopted efficient

measures for the extinction of slavery. But the smiling aspect which affairs began to assume was soon overcast by the ambition of three brothers named Carera, who succeeded in forming a new government, and dividing the interests of the country just at the very moment when union was almost indispensable to the existence of the new system of things. The Spaniards in Peru took advantage of the crisis, landed an army in Chili, and seized the city of Conception and some other places. This occurred early in 1813. The Chilinos were not long in making head against the foe, and a bloody battle was fought, in which the patriots were victorious, the Spaniards retreating to a town which they strongly fortified. But various engagements took place, in which the royalists were generally successful, and by the end of 1814, the principal Chilinos leaders were forced to seek refuge beyond the Andes, which divide Chili from the plains of La Plata. Once more, then, the Spanish power became dominant in Chili, but its ascendency was of short duration, for the celebrated general, San Martin, who makes such a figure in the subsequent history of South America, was at this period busily employed in organizing an army for the liberation of his country, and with which he in no long time achieved it.

In New Granada and Venezuela the struggle was more bloody, variable, and protracted, than in any other part of South America. This portion of the dominions of Spain being comparatively easy of access, and, from its central position, to a certain extent a key to the whole, she made proportionate attempts to retain possession of it. Within the course of one year, no less than 10,000 troops were landed in it. To attempt any thing like a detail of the military operations would carry us far beyond our limits, the vicissitudes of the war being so numerous and extraordinary, from 1809, when juntas were established in Caraccas and Quito, to the surrender of Porto Cabello in 1823. It was here that the famous Simon Bolivar first made his appearance, and also the celebrated General Miranda, one of the earliest martyrs to South American independence. It was he who made the heroic attempt to raise the country in 1806; and now that a more favourable opportunity presented itself of achieving his favourite object, he reappeared on the scene of his former discomfiture. In July, 1811, Venezuela declared its independence of Spain and all other nations; a constitution was drawn up, a congress assembled early in 1812, and every thing seemed to promise a speedy termination to the struggle in this quarter. But the whole aspect of affairs was changed by an earthquake, which overwhelmed the city of Caracccas, burying many thousands of the inhabitants under the ruins. It is not new for the superstitious inhabitants of the peninsula to attribute calamities produced by natural causes to the direct interference of the Almighty with the affairs of men. Thus the earthquake which destroyed the city of Lisbon, was by many attributed to the Jesuits, who were supposed to have drawn down the vengeance of Heaven! And such was the pernicious influence of the clergy over the minds of the people on the present occasion, that the dreadful casualty came to be generally regarded as a work of divine vengeance for their adopting the new order of things. The consequence was a great change for the worse in public opinion, which the Spaniards were not slow to take advantage of. Monteverde, a royalist general, marched against Caraccas, and soon effected its resubjugation, Bolivar himself escaping to Curacoa. In 1813, he returned; and being intrusted with an army by the confederation of Granada, he again effected the liberation of Venezuela. Finding the necessity of intrusting their affairs to the guidance of some one energetic mind, the Venezuelans named him dictator; and by his exertions, a union between the republics of Granada and Venezuela was for the first time effected in 1819, Quito being at this time under the dominion of the Spaniards. This was the first confederation, styled the *Republic of Colombia*. At the congress which ensued, a republican constitution was established, Bolivar being elected president, and Santander vice-president. The former immediately returned to the seat of war; and after two years' campaign, the details of which it is impossible to give here, succeeded in completely overthrowing the Spanish power in Colombia.

The most decisive battle of the whole war was fought on the 7th of August, 1819, at the bridge of Boyaca, where the royalists were completely ruined, nearly their whole army being taken prisoners. This triumph decided the fate of New Granada, giving the patriots an ascendency which they never afterwards lost. It is a coincidence not unworthy of being noticed, that the last battle in which the liberties of the ancient inhabitants of the country were stricken down by the Spaniards, was fought on the same spot. The balance was now restored by the fortune of war.

We left General Balcarce with the army of Buenos Ayres retiring before the royalists of Upper Peru. He was superseded by General Belgrano, who, after one or two victories, was totally defeated on the 14th of November, 1813; the patriot cause was thus brought to a low ebb in the interior. Buenos Ayres had early turned its attention to the important province of Paraguay, where, after various changes of fortune, a new government was finally erected, with the celebrated Dr. Francia at its head, as dictator. The career of this individual has been more extraordinary than that of any one which the revolutionary struggle brought upon the theatre of action. The government which he established was as completely despotic as any that mankind were ever doomed to suffer under; and this iron ruler succeeded most effectually in cutting off Paraguay not only from the neighbouring republics, but even from the rest of the world. It is impossible to follow all the changes which the government of Buenos Ayres underwent, and all the civil dissensions by which the country continued to be torn. Monte Video, which had long held out for the mother country, capitulated in June, 1814. This important fortress was afterwards taken possession of by Artigas, a famous gaucho chieftain, who for some time ruled the whole of the pampas from the Andes to Brazil. The congress of Buenos Ayres having determined on holding its sessions in that city, issued a declaration of the causes which led the vice-royalty to shake off the yoke of Spain, and assume the title of the United Provinces of South America. In May, 1819, a constitution was published by congress. It was on the model of that of the United States, and secured personal freedom and equality, liberty of conscience and of the press, the right of suffrage, and other privileges. Although afflicted with internal dissensions, Buenos Ayres was ever ready to aid the cause of independence in other quarters, and rendered efficient service to the Chilinos, who, under San Martin, were mustering their strength upon the frontiers. Early in 1817, this able commander led his small army of 5000 men through the passes of the Andes into the plains of Chili, where the royalists, twice as strong, were taken by surprise and utterly defeated. In repeated engagements they suffered the same casualty, and their power rapidly declined. Before the end of the year, several important places fell into the hands of the patriots, and San Martin was elected supreme director of Chili, but declining the honour, it was conferred on O'Higgins, another distinguished general. The great struggle, however, was yet to take place. The royalists received a strong reinforcement from Peru, and the patriots another from Buenos Ayres, so that, early in 1818, both armies took the field with a considerable accession of strength. On the 5th of April was fought the battle

at Maypu, in which the royalists were totally routed, and after which the patriots never again lost the ascendency. In order to clear the Pacific of Spanish ships of war, the naval force of Chili was augmented, and ultimately came to be commanded by the celebrated Lord Cochrane, who lent to this remote American state the naval glory which had belonged almost alone to Britain. Peru had from the first been the stronghold of the royalists, and as from her ports expeditions had repeatedly issued to aid the royalists in other quarters, it was considered that, as long as Spain was enabled to do this with impunity, the cause of independence would stand on a precarious footing in Chili. Accordingly, San Martin resolved on carrying the war into the heart of the enemy's country. He landed with a considerable body of troops, succeeded in capturing Lima, and was soon afterwards declared protector of the new republic, with supreme power, civil and military. San Martin then drew up a constitution upon very free principles; but the views of the people had become so democratic that nothing would satisfy them. The plan was disapproved of, and the protector retired.

Meanwhile, these dissensions gave courage to the royalists, who collected in great force under General Canterac, and advanced upon Lima, of which they obtained possession. The proceedings of the new patriot government were marked by feebleness and discord. Some reverses in the field followed, and the cause of independence seemed hanging by a thread which it required little exertion to break, when the celebrated Bolivar made his appearance in the country on the 1st of September, 1823. He was received with the greatest enthusiasm, and immediately invested with supreme authority, military and political. Great activity was now infused into the measures of government. Congress was dissolved and an army levied, with which Bolivar sallied from the capital early in November. But fresh misfortunes overtook the cause of the patriots. The city of Lima, and its port Callao, once more fell into the hands of the royalists, and, but for the firmness and decision of Bolivar, the consequences might have been disastrous to Peruvian independence. The dictator, however, proved equal to the crisis. There was a charm in the name of Bolivar, and he was looked up to as the only man capable of saving the republic. He did not disappoint general expectation; for in less than a year from that time, South American independence was finally established. After a series of marches and manœuvres, the liberating army and the royalists met on the plain of Ayacucho, where a battle was fought, "the most brilliant," as General Miller says, "ever fought in South America." The Spanish army was all but annihilated; and this may be considered as the last regular engagement, although not the last struggle, in which Spain was engaged for the recovery of her revolted colonies. It was fought upon the 9th of December, 1824.

In Bolivia, or Upper Peru, the royalists still retained an ascendency, but now that the victory of Ayacucho enabled the patriots to pour additional troops into the country, under Sucre, a general alike distinguished for his valour and ability, the cause of royalty rapidly declined. Olaneta, the Spanish commander, was killed in an affray with some of his own revolted troops in March, 1825, and from this time all serious opposition in the field was at an end. But General Rodil still held out the strong port of Callao against the patriots. It was a gallant but a hopeless defence. For thirteen months he sustained, unaided, bombardments both by sea and land, but at length capitulated on the 19th of January, 1826. Almost contemporaneously with this event, the island of Chiloe was captured by a patriot force, and the Spanish flag ceased to wave on the territory of Chili.

We shall now present a view of the various republics which arose out of the ruins of the Spanish dominions in South America; though without pledging ourselves for the accuracy of all our details, as the state of information on the ever-shifting political condition and general statistics of the different states is exceedingly defective. Brazil, the largest and most important state of this continent, was all along totally unconnected with the others; and belonging to another order of things, was reserved for a different destiny. The republic in which the revolt may be said to have originated, and from which it drew the vital strength that ensured ultimate success, was

BUENOS AYRES, OR THE UNITED PROVINCES OF THE RIO DE LA PLATA.

The united provinces of La Plata, or the Argentine Republic, comprises the whole of that vast space extending from the cordillera of Chili and Peru to Brazil, with the exception of Paraguay and the Banda Oriental, which are independent states. It extends from the 22d to the 41st degree of south latitude, and from 55 degrees 36 minutes to 71 degrees of west longitude, comprising an area of 720,000 square miles English, and divided into thirteen provinces, which, to a certain extent, govern themselves independently of each other, but for all general or national purposes, are confederated by conventional agreements. For want of a more defined national executive, the provincial government of Buenos Ayres is temporarily charged with carrying on the business of the union with foreign powers, and with the management of all matters appertaining to the republic in common. The executive power of that government, as constituted in 1821, is vested in the governor or captain-general, as he is styled, aided by a council of ministers appointed by himself, responsible to the junta, or legislative assembly of the province by which he is elected. The junta itself consists of forty-four deputies, one-half of whom are annually renewed by popular election. It was at first attempted to establish a system of federalism, by which Buenos Ayres should exercise immediate control over the other provinces; but from various causes the plan proved quite abortive. The national organization of this state is now limited to the slender bonds of voluntary confederation, not only with each other, but with the old metropolis, Buenos Ayres. The whole territory is an almost uniformly level plain of great fertility, watered by the large rivers La Plata, Parana, Paraguay, and Uruguay, and several others of smaller dimensions; the Talado, Pileomayo, Vermijo, Nuevo, and that which empties itself into the lake Solatos, being the most important. There are likewise a number of lakes, the waters of which are brackish. There are almost no natural trees in the province, but there are numerous plantations, or rather orchards, of peach trees, which the natives cultivate for firewood—the fruit being applied to feeding the swine and poultry. Immense forests of thistles spring up at certain seasons of the year, of ten and twelve feet in height. Deer are plentiful in the wilder parts, but little prized where there is so much fine beef. The climate is extremely salubrious, and, singularly enough, is almost entirely governed by the winds, which, generally speaking, are northerly.

One of the distinguishing characteristics of La Plata, are the vast plains called *pampas*, one portion of which extends from the banks of the Paraguay westward to the frontiers of Los Charcas, and northward to the mountains of Chiquitos—another immense plain, 300 miles in length from east to west, and 1500 miles from north to south, as far as Patagonia. These plains present one uniform expanse of waving grass, uninterrupted by either wood or eminence, although in some places parched and barren, and perfectly uninhabited, unless by innumerable herds of wild oxen, horses, ostriches, and other animals. Over these pampas lies the only route

by land from Buenos Ayres to Chili, which journey was formerly performed by large companies, as the plains were infested by hordes of roving Indians, who went here to hunt, catch wild horses, and plunder. From the absence of all permanent land-marks, the travellers over these immense plains shaped their course by the compass, and their caravans were in reality movable houses, solid and defensible. Of late years, regular post-houses have been established along the whole line of road between Santiago (the capital of Chili) and Buenos Ayres —a distance of nearly 1400 miles—and a regular communication is kept up between the two republics by means of couriers, who perform their journeys with uncommon speed.

The city of Buenos Ayres is situated on the southern margin of the river Plata, where the latter is formed by the confluence of the Parana, Uruguay, and Negro rivers. It is thus, as it were, the key to all the internal navigation. The length of the Plata, from its formation to the ocean, is upwards of 700 miles. The city occupies a large extent of ground, being about two miles long, and a mile and a half broad, all the streets crossing at right angles. There are a university, several educational establishments, and a number of churches. The prosperity of Buenos Ayres and the other provinces is greatly impeded by the defective navigation of the river Plata, which is filled with shoals and sandbanks, and therefore dangerous to large vessels, otherwise the city of Buenos Ayres would become one of the largest emporiums of commerce in the world. The rivers Parana and Uruguay are each navigable for vessels of from 200 to 300 tons, 1500 miles into the interior; the former running through Paraguay into the centre of Bolivia. In 1806, Buenos Ayres was taken by a small English expedition, under Admiral Popham and General Beresford; but the inhabitants, recovering from their surprise, soon afterwards drove their assailants from the town. In the following year, General Whitelock arrived with reinforcements; the troops were quietly permitted to enter the town, when they were repulsed with great slaughter, and ultimately compelled to evacuate the La Plata. There were no fortifications at the time the city was attacked by the British troops, and it was indebted for its strength solely to the peculiar structure of its buildings.

The estimated population of the provinces of the Rio de la Plata, in 1836–7, was from 600,000 to 675,000, exclusive of independent Indians within the territory laid claim to by the republic. Of this number of inhabitants, from 180,000 to 200,000 were reckoned as belonging to Buenos Ayres. Into details of trade we cannot enter; indeed, it is impossible to obtain correct information regarding the interior provinces, their commerce being mostly of a domestic or internal nature. Buenos Ayres is of course the great centre of foreign trade. In 1837, the imports from Great Britain amounted to £696,104; the total imports into the republic being valued at 7,000,000 dollars. The exports during the same year amounted to 5,837,138 dollars, consisting chiefly of ox hides, gold and silver, sheeps' wool, jerk beef, horse hair, tallow, sheep-skins, and other products of the country. Of late years, the imports into Buenos Ayres have decreased, whilst those of Monte Video have increased.

PARAGUAY.

The republic of Paraguay, formerly one of the united provinces of the vice-royalty of Buenos Ayres, is situated between the rivers Parana (on the east and south) and Paraguay (on the west). It is divided by a desert tract from Brazil on the north. It comprises an area of about 50,000 square miles, with a population of about 250,000, seven-tenths of which are Creoles.

The climate of Paraguay is mild and healthy, although moist, being low and level. All sorts of tropical fruits, corn, vines, sugar-cane, rice, maize, tobacco, *indigo*, and a number of valuable medicinal plants, abound in profusion. There is a particular plant peculiar to Paraguay, called *yerba*, and, when decocted, *matte*, which greatly resembles the tea of China, and is by many preferred to the latter. It is universally used in South America. Of late years it has been cultivated in Brazil with great success. Immense herds of cattle roam over the vast plains, whose hides and tallow form an article of commerce.

From shortly after the declaration of independence in 1811, until 1838, this beautiful and prolific region was governed in a despotic manner by Doctor Francia, a man of considerable talent, but it is believed partly crazed in mind, who had the address, like Cromwell, to dissolve the temporary government established by the revolutionary party, and to appoint himself sole and perpetual dictator of the state. All things were now managed by him; he planned roads, bridges, and other public works, organized the army, and interfered in the most minute arrangements. His rule was supported by excessive cruelty, and he lived in constant fear of assassination. This extraordinary despot died, in his eighty-second year, in 1838; but what has been the political condition of the state since we have not heard. Some writers are disposed to think that, upon the whole, Francia's dictatorship was beneficial for the country, as he carried on various objects of utility, and procured respect and tranquillity for his people.

URUGUAY, OR BANDA ORIENTAL.

This comparatively small state, which occasioned a long and bloody contention between the united provinces and the Brazilian government, is situated between the river Uruguay and the Atlantic from south to north, and between the rivers Plata and Parana from east to west. From its position, between the Spanish and Portuguese settlements, it soon became an object of contention; but it would be a waste of time to follow the course of the struggle. Suffice it to say, that after much blood had been shed on both sides, in a war of more than half a century's duration, during which the disputed territory, by being the common battle-field, was devastated by both, the contending parties at last drew stakes, and it was erected into an independent state in 1829. It is equally distinguished for fertility of soil, salubrity of climate, natural beauty, and geographical position. It abounds in excellent pastures, which are fertilized by an unusually large number of streams, in which respect it is greatly superior to the rival provinces on the opposite banks of the Rio de la Plata. The city of Monte Video, the capital of the republic, is situated on the northern bank of the great river just named, near its mouth, 130 miles north-east from Buenos Ayres, in latitude 34° 50′ south, and longitude 56° 20′ west. The importance of this city has greatly increased since the erection of the country into an independent republic. A lowering of the duties on import trade, whilst those of Buenos Ayres remained high, brought foreign goods to it, so that it has in some measure supplanted its rival, and become an entrepôt for the supply of the neighbouring provinces. This is the cause of the diminution in the amount of imports into Buenos Ayres, to which allusion has already been made. In 1836, the importations of foreign goods into Monte Video amounted to 3,500,000 dollars, whilst the exports were nearly equal in value, and now constitute an important proportion of the returns in the general account of the trade with the river Plata. The population of the Banda Oriental is estimated by Sir Woodbine Parish (1839) to be from 100,000 to 120,000 souls, and is rapidly increasing.

CHILI.

Chili is bounded on the north by La Plata, on the east and south by Patagonia, from which it is separ-

by the Andes, and on the west by the Pacific Ocean, along the shores of which it stretches from 21° to 43° of south latitude. It is 1300 miles long, and from 30 to 190 broad. The ground ascends gradually from the ocean to the Andes, but is intersected by their projecting branches, some of which run almost down to the sea-shore. There is no deficiency of rivers in Chili, but in general they are small, and running from the Cordillera to the Pacific, they have necessarily short courses. These streams are indispensable to the existence of agriculture, in a country where it rains very seldom, and to a very limited extent. The fertility of the soil of Chili has in many respects been much overrated. It presents great diversities. In some parts where irrigation is deficient, it is barren and unproductive; in others quite the reverse; and amid splendid woodlands, the finest crops of wheat, barley, rye, and other species of grain, are raised, with scarcely any trouble to the cultivator beyond scattering the seed. Cotton, sugar-cane, vines, &c., are also extensively cultivated. The country is perfectly free of all noxious reptiles, the climate salubrious, and the weather serene. The want of navigable

MAP OF SOUTH AMERICA.

rivers is unfavourable to commerce; and although there are many rich mines of gold, silver, and copper, in the northern provinces, the sterility of the country around them prevents many of them from being wrought.

In 1827, the directorship of Chili was changed into a presidency, in imitation of the United States. The established religion is the Roman Catholic, the priesthood not being numerous, as was the case prior to the revolution. The constitution of Chili is that of a federal republic, consisting of three states, namely, Coquimbo, Santiago, and Conception, and one district, Chiloe, each having a provincial assembly, and all four a common congress, or executive power, which holds its sittings at Santiago.

Chili is divided into eight provinces, which contain a population of about 600,000. The principal towns are Santiago, with 65,675 inhabitants; Valparaiso, with 26,000; Conception, with 10,500; and there are, besides, Penco, Coquimbo, Copiapo, and others of inferior note. In 1836, the outlay of the state was reckoned at 1,840,204 dollars, the receipts being above 300,000 dollars more, which served to pay the interest of the English loan, or, at all events, a part of it; for their affairs are in great confusion, and their debts are so mixed up with those of Peru, that it is difficult to determine how they stand. By allowing the interest of their loan to remain for years unpaid, the debt has accumulated in such a manner as to have destroyed national credit. The perpetual broils with Peru have materially contributed to retard the advancement of this country, which has certainly very considerable resources, and an enterprising and intelligent population. To enter into particulars regarding this long-standing quarrel, is not compatible with our limits. It originated in a loan which Chili gave to Peru, to assist her in the period of her distress, and which the latter has not been grateful or honest enough to refund. Peace and war have more than once been proclaimed between the two states within these few years, and so late as 1839 the army of Peru was, through treachery, it is said, nearly extirpated by the troops of Chili.—See PERU.

During the year 1834, there was exported from Chili, gold, silver, and copper, to the amount of 3,158,143 dollars. The other chief articles of export are hides, timber, wheat, flour, fruits, Cortex Peruvianus, indigo, tin, and seal-skins. The imports into Chili from Great Britain, chiefly of manufactured goods, amounted in 1835 to £606,176. The native manufactures of Chili are insignificant. A great number of islands stretch along the coast, and belong to this republic, but they are too small and unimportant to require special notice in this place. Valparaiso is the great port of Chili into which all foreign goods enter. In 1835, about 400 vessels here delivered their cargoes.

PERU.

Ever since the declaration of independence, Peru has been a scene of political squabbling and change, into the details of which we need not enter. In 1836, the country was divided into North Peru and South Peru, the chief power being vested in a supreme protector, and a close intimacy was then entered into with the neighbouring republic of Bolivia. The constitution, established by a congress of the three confederated states of North and South Peru, and Bolivia, is modelled upon that of the United States of North America. Each of the three republics was to have its own distinct congress, and, collectively, they may be said to have formed a federal republic, united to one another for mutual support and protection. The head of the confederation was chosen by the general congress, out of six candidates proposed by the three republics. The first person appointed to the protectorship of the Peruvio-Bolivian confederation was General Santa Cruz, who then virtually became the head of three independent states. He was elected for ten years. With regard to the constitution of each republic, little appears to have been agreed to besides the general principle that the government of the countries should be intrusted to a senate and house of representatives.

We have already alluded to the declarations of war which have passed between Peru and Chili. Hostilities do not appear to have yet terminated, and these infant states, instead of bending their energies to the development of the resources of the country, are tearing each other to pieces by the bloody and ever-losing game of war. A squadron from Chili took the city of Lima, in August, 1838, after an action in which 2000 men were killed. Santa Cruz immediately advanced upon the city, but in the mean time the Chilinos had evacuated it, and penetrated farther into the country. They were followed by the Bolivian chief with a considerable army, but, in January, 1839, he allowed himself to be surprised, when nearly his whole troops were either killed or taken prisoners. Santa Cruz soon after published a proclamation, by which he abdicated the protectoral authority over Peru; and, by another decree, he resigned the presidency of Bolivia. It were vain to speculate how matters will terminate; but in all likelihood Bolivia will remain a separate state, and North and South Peru will again amalgamate and form one republic.

The boundaries of North and South Peru are as yet so imperfectly defined, that in our description of this region, we shall consider them as forming one whole. Indeed, it is very probable, as we have said, that they will soon again be united as formerly. Peru extends from 3 degrees 34 minutes to about 22 degrees of south latitude, and from 62 degrees to 82 degrees of west longitude. Its length is computed at 1500 miles, but its coast line on the Pacific Ocean cannot be less than 2100, reckoning the bendings of the shore. According to Humboldt's estimate, Peru comprises an area of 45,500 square leagues. The surface of this vast territory is of the boldest and most varied description. It is naturally divided into three regions, Western Peru, situated to the west of the Andes; Eastern Peru, situated to the east of that mountain chain; and Peru of the Andes, which comprises the mountainous districts. Western Peru is a belt or zone of sand nearly 2000 miles in length, and having an average breadth of thirty or forty miles. No rain falls throughout the whole of this desolate Sahara of the west, and vegetation only springs up on the banks of the rivers which run from the Andes to the Pacific. The habitable parts of Western Peru, therefore, are merely a series of oases "islanded amid the waste of sand," like those of Africa. Yet here are situated the city of Lima and several other large towns, the only seaports of the republic. Peru of the Andes, as might be inferred from its varied elevation above the level of the sea, presents a great diversity of soil, climate, and vegetation. Suffice it to say that in different parts it exhibits every species of production, from the dwarf plants of Lapland, which clothe the lofty mountain tops, to the aromatic species of Sumatra, which shed their odours at its base. This portion of Peru contains the sources of those vast rivers which traverse the whole continent of South America, and are the greatest on the face of the globe. But by far the largest, most beautiful, and most valuable part of the Peruvian territory, lies to the east of the Andes, commencing on the eastern declivity of the second chain, and stretching to the confines of Brazil. In this vast region, a thousand sources of wealth lie buried, for the greater part of it may be said to be yet unknown, although the riches which it contains are immense. In fertility, luxuriance, and variety of vegetation, it rivals Brazil, and the world does not present us with any higher standard of comparison. Every sort of production which springs from the ground may be

metal in one part of Peru or another in the amplest abundance. Its mineral treasures are gold, silver, platina, tin, copper, lead, quicksilver, precious stones, salt, alum, saltpetre, coal, sulphur, and others. The most valuable of these are in great plenty.

Peru carries on considerable trade with Great Britain, the United States, France, the kindred republics of South America, and other places. A treaty of amity, commerce, and navigation, with Great Britain, was signed at Lima on the 5th of June, 1837; by which perpetual freedom of trade was established with the countries of the Peruvio-Bolivian confederation. The chief articles of export are gold and silver, Peruvian bark, hides, nitre, sugar (unrefined), cotton, and sheeps' wool, tin, molasses, pot and pearl ashes, &c. The imports into Peru from Great Britain, chiefly of manufactured goods, amounted, in 1833, to £387,524. In 1834, the imports fell, on account of political agitations, but they have since risen, and on an average of years are steadily increasing. In 1835, they amounted to £441,324. The exports to the United States, in 1835, amounted to 1,118,278 dollars; those to France and other places were likewise considerable. The present revenue of Peru has been estimated at £1,250,000; the expenditure at a little less than that sum; and the national debt at £6,000,000. But precise information on these points is not to be obtained. There is a standing army of 3000 men maintained in Peru, and 2000 in Bolivia, according to the articles of confederation. The religion of the republic is the Roman Catholic, no other being tolerated. Slavery has been long abolished here; but the state of the country in regard to education and morals, is still very low. The total population of Peru in 1838, was estimated at 1,700,000, consisting of three original castes—Spaniards, Indians, and Negroes, and all their possible combinations. Lima, the capital, which was formerly the grand entrepôt for the trade of all the west coast of South America, contains a population of 70,000. All the trade is carried on at Callao, which, although six miles distant, is the port of Lima. The next most important place is Cuzco, the chief town of the interior, and the ancient capital of the incas. Here are some magnificent remains of the former riches and splendour of Peru, particularly a Temple of the Sun, the wealth of which, when first spoiled by the Spaniards, was almost incalculable. The remembrance of the ancient heathen worship is still preserved by an honorary institution, called the "Order of the Sun." Besides Lima and Cuzco, the next largest town is the maritime port of Arequipa, which has been six times destroyed by eruptions from a neighbouring mountain, and yet possessed a population of 40,000, previous to the revolution. There are also a great many other towns of minor importance. Earthquakes are frequent in Peru. The city of Lima has been three times almost entirely destroyed by these visitations—in 1687, 1746, and 1828.

BOLIVIA.

After independence was established in 1825, this portion of the ancient vice-royalty of Buenos Ayres received the name which it now bears, conferred in honour of the liberator, General Bolivar. A constitution, drawn up chiefly by Bolivar, and called the Bolivian Code, was immediately introduced, and for two years the republic was tranquil under the presidency of General Sucre. But when the great *libertador* became unpopular in his own country, and those troubles arose which darkened the close of his career, his constitution was rejected from Bolivia, the president was deposed, and Santa Cruz was elevated to the dignity. The present position of this republic we have already spoken of under Peru.

Bolivia is bounded on the north by Peru and Brazil, on the east by Brazil, on the south by the Buenos Ayrean provinces and Chili, and on the west by the Pacific Ocean and Peru. It comprehends a space of 480,000 square miles, and the population is estimated at 1,200,000, of whom probably two-thirds are Indians. This republic includes five of the provinces which were formerly under the Buenos Ayrean vice-royalty, but has been divided by the new government into six departments, namely, Potosi, Chuquisaca, La Paz, Santa Cruz, Cochabamba, and Oruro. The greater part of Bolivia is situated at a very high elevation, but towards the east it stretches down in extensive plains towards Brazil. The climate, therefore, is extremely various. On the high parts, snow-storms and hurricanes frequently prevail, and the plains, from the rigour of the weather, are nearly destitute of vegetation. The climate of Potosi, at an average elevation of 13,400 feet, is so changeable, that it frequently exhibits in one day all the vicissitudes of the four seasons of the year. Thence descending through the regions of Oruro, at an elevation of 12,400 feet, La Paz at 12,100, Chuquisaca at 9300, Cochabamba at 8400, down to the plains of Majos and Chiquitos, all the known degrees of temperature, from extreme cold to extreme heat, are experienced. This elevated region is enriched with the most valuable mines of gold and silver, which, with other precious metals, form the only articles of Bolivian commerce. The mountain of Illumini, in La Paz, which is supposed to contain rich veins of gold ore, is 24,000 feet above the level of the sea. From the great difficulty of working the mines, and the expense of extracting the ore, the greater part of the gold of Bolivia is obtained from the *lavaderos*, or gold washings in the beds of rivulets, where it is found in the shape of grains. The most productive of these *lavaderos* are those of Tipuani, in the province of Larecaja. Silver, however, is the great staple metallic production of Bolivia; and the famous mountain of Potosi is ranked next in importance to the mines of Guanaxuata in Mexico. On account of the inconsiderable nature of the rivers flowing from Bolivia to the Pacific, and the badness of the roads, it is impossible this country can enjoy much commerce with the Pacific; but towards the east, several large streams communicate with the great navigable rivers that flow into the Atlantic Ocean. The river Paro, or Beni, which rises near La Paz, and the Guapey, which rises near Cochabamba, after a long sweep, unite with the Mamori, and, flowing to the north-east, mingle with the waters of the Maranon or Amazon. The Picomayo, again, which rises near Potosi and Chuquisaca, and the Vermejo, which rises in the valley of Tarija, flow to the south-east, and mingle with the Paraguay, the upper part of the mighty Rio de la Plata. All these rivers are navigable almost to their source, and, with steam navigation, would open up a direct communication between these rich districts and the nations of Europe.

The table land of Titicaca is the most elevated on the globe, with the exception of that of Thibet; but while the latter only presents pastures and flocks of sheep, the former exhibits towns and populous cities, and is covered with fine crops of wheat, barley, rye, &c. The lake of Titicaca is 12,700 feet above the level of the sea, and is twenty times the size of the lake of Geneva. It contains several islands, the largest of which, named Titicaca, is the place whence Manco Capac, and his wife Manco Oello Huaco, were represented by Peruvian tradition to have come forth to found the empire of the incas, and spread civilization, industry, and good government through the nations. A magnificent and gorgeous Temple of the Sun was afterwards erected here, the whole ornaments and wealth of which are said to have been thrown into the lake, to prevent their falling into the hands of the Spaniards.

COLOMBIA, OR THE REPUBLICS OF VENEZUELA, NEW GRANADA, AND QUITO.

For three years after the establishment of Independence in Colombia, the country remained tranquil, Santander being vice-president, and exercising executive power in Bolivar's absence. The Peruvians had elected the latter president for life, and adopted his celebrated code; but as he belonged to Colombia, and as symptoms of rebellion had become apparent in that country, he resolved on relinquishing all the honours which the Peruvians were desirous of conferring on him, and returning to his native country. He arrived towards the close of 1826, from which period till his death in 1830, Colombia was a scene of turmoil and bloodshed. The person who played the most conspicuous part in this tumultuous drama, besides Bolivar himself, was General Paez, who had been appointed to the command of Venezuela. He gave great offence by his arbitrary conduct, was impeached, but refused to make his appearance. Immediately thereafter, he placed himself at the head of a strong party opposed to the central system, and desirous of a separation from New Granada. Bolivar succeeded in quelling this insurrection of the north-eastern provinces, but the violence of parties again broke forth in 1828. The events which followed finally resulted in Bolivar's assuming absolute authority; from which period his popularity declined. Plots were formed to assassinate him, but all these attempts ended in the destruction of the projectors, and in Bolivar's exercising, probably to an unwarrantable extent, the absolute power which had been intrusted to him. In 1829, war was declared against Colombia by Peru. The causes of this are partly to be attributed to personal animosity, partly to national jealousy, partly to a desire to get possession of Guayaquil, one of the principal ports of the Colombian territory. The armies met at Tarqui, in Quito, when a sanguinary conflict took place, in which the Peruvians were defeated; and this, along with other circumstances, for a time raised the hopes of Bolivar and his friends. The great cause of difference between the dictator and the people was the Bolivian code or constitution, which did not, it was asserted, allow enough of liberty to the subject, the country being eminently republican and democratic in its views. The fact is, the people had become intoxicated with their freedom, and nothing short of licentiousness would satisfy them. But a civil war was prevented by the death of Bolivar, which took place on the 17th of December, 1830. As soon as this event became known, the three component states of Colombia peaceably agreed to become independent of one another. The limits of these states are nearly the same as they were when each was a separate province subject to Spain. Their constitutions are based on the most liberal republican principles, and they are leagued together for mutual support against foreign aggression. The national debt of Colombia was equally divided among the three states in December, 1834; slavery was for ever abolished in all of them; and, upon the whole, they are likely to go on much more peaceably and rationally apart, than if they were united under one head. We shall give a brief description of each state.

NEW GRANADA.

This republic is bounded on the north by the Caribbean Sea and Guatemala; on the east by Venezuela and Guiana; on the south by the Amazon and Quito; and on the west by the Pacific Ocean. The great chain of the Andes traverses this country, and the mountains are extremely rich in gold and silver; and there are also mines of platina, copper, lead, and emeralds. The value of gold and silver produced annually is stated at £650,000. It is divided into five districts and thirteen provinces, the united population of which, according to the census of 1835, amounts to 1,687,109; or, on account of errors, 1,700,000. Santa Fe de Bogota is the capital of the republic; it has a population of above 40,000. Here a national academy was opened in 1833. In 1835, the income amounted to 3,337,836 dollers, and the expenditure to 2,211,554 dollars; leaving a balance of 126,282 dollars for payment of the interest of the national debt. The share which belongs to New Granada was above £3,000,000. The principal articles of export are cocoa, indigo, tobacco, coffee, hides, and cattle. The imports are manufactured goods of almost every description. What the value of these may be, it is impossible to say, for the contraband trade has been here carried on to an almost unparalleled extent.

VENEZUELA.

This state extends from the republic of Quito or the Equator to 12 degrees of north latitude, and from 60 degrees to 71 degrees 36 minutes of west longitude. On the north and east it is washed by the Atlantic Ocean, and has a number of good ports. The most remarkable feature of the country is the great river Orinoco. It is also traversed by the Andes; and the great lakes of Maracaybo and Valencia belong to its territory. The northern part is mountainous; but in the south, on the banks of the Orinoco, are immense plains, called *llanos*, the climate of which is hot, and in some parts unhealthy. The year is completely divided into the rainy and the dry seasons; the former commencing in November and ending in April. The productions are sugar, coffee, indigo, cotton, and tobacco. The plains on the Orinoco furnish extensive pastures, which support numerous herds of cattle. Venezuela is partitioned into four departments, and further divided into twelve provinces, which contain in all a population of 829,000. The budget for 1838 was estimated at 1,763,649 piastres. According to the division of the national debt already noticed, £1,941,705 fell to the share of Venezuela. The patronage of the church has been taken from the archbishop of Caraccas, and is now in the hands of the president. Tithes are abolished, the clergy being paid by the state. Monastic institutions and missions have been done away with, their income and possessions being applied to the uses of the National College established at Maracaybo for public instruction. The principal town of Venezuela are Caraccas, with a population of probably 40,000; Cumana, a sea-port, with 25,000 inhabitants; Varinas, with 12,000; and Maracaybo, situated on the margin of the great lake of the same name, which has 25,000 inhabitants. The cultivation of the soil and the rearing of cattle are the great objects of industry in this republic. With the overplus of these, the inhabitants obtain the manufactures of Europe. The chief articles of export are cocoa, coffee, sugar, tobacco, cotton, hides, dye-woods, sarsaparilla, Peruvian bark, balsam, indigo, furs, &c. The imports are for the most part the fabrics of England and France. It is difficult to state with certainty what the exports and imports may amount to respectively, but the former may be estimated at 2,000,000, and the latter at 4,000,000 of piastres. (A piastre is equal to 4s. 3½d. sterling.)

EQUATOR, OR QUITO.

The territory of the Equator comprehends the ancient presidency of Quito, extending from 2 degrees of north to 6 degrees of south latitude, and from 75 degrees 30 minutes to 80 degrees 40 minutes of west longitude. On the south it borders on Peru and Brazil, the latter country forming also its eastern boundary; on the north its limits are New Granada, and it is washed by the Pacific Ocean on the west. This republic is intersected by both chains of the Andes, and consequently presents great diversity of surface and climate.

The high valleys enjoy a temperate climate, although situated immediately under the equator, a consequence of their great elevation. They are extremely fruitful, and would be the most charming places in the world, were it not for the destructive earthquakes and volcanic eruptions with which they are not unfrequently visited. There are sixteen active volcanoes in Quito; and some of the most frightful earthquakes on record have taken place in this country. The valley in which the city of Quito is situated is allowed to be the finest table-land in America, and all travellers speak in glowing terms of its surpassing loveliness. The fertility of some parts almost exceeds belief. Every thing of vegetable kind is produced in the greatest abundance. Gold and silver are comprised in the metallic riches of the mountain territory.

This republic is divided into eight provinces, the population of which is estimated at 550,000, more than the half of whom are Indians, who dwell in the mountains. The capital of the country is Quito, one of the largest and finest cities in the New World. It stands at an elevation of 9000 feet above the ocean level, but being nearly under the equator, has a bland and genial climate. Quito has two universities, and it has always enjoyed celebrity for the great number of students by which they are attended. The population is estimated at 75,000. The great port of this republic, and indeed of the whole three republics formerly constituting Colombia, is Guayaquil. In the year 1835, there entered inwards 123 vessels of 21,430 tons burden in all, and with cargoes valued at £221,680. The same number cleared outwards, and the value of their cargoes was £210,429. The imports consist chiefly of British manufactures, flour, wine, and other necessaries; the exports of cocoa, timber, and the various other vegetable products of the country. With regard to the income and expenditure, little correct information is to be obtained. The former has been reckoned at 800,000 piastres, and the latter at about as much; but by the most recent intelligence, the minister of finance estimates the outlay as low as 171,086 piastres. By the treaty regarding the national debt, £1,464,795 fell to the lot of the republic of Equator. On the 1st of May, 1835, the congress of the nation, consisting of forty-five members, agreed to draw up a plan of a constitution for the country; but it does not appear that they have yet come to a complete understanding as to the details.

It is worthy of being mentioned, that the independence of all the republics of America, which formerly were Spanish provinces, was regularly recognised by Spain on the 5th of December, 1836.

BRAZIL.

Brazil is by far the largest and most important state in the New World. The climate is more generally salubrious and agreeable than that of any other tropical country, and every part of the soil is rich, fertile, and exuberant of vegetation. It is in a manner encircled by Banda Oriental, Paraguay, Bolivia, Peru, Colombia, and Guiana; bounded on the east and north-east by the Atlantic, and possessing the immense range of coast from beyond the Rio Grande South (about half way between Rio Janeiro and La Plata) and the Amazon. The territory within these limits has been estimated by some at 2,500,000, and by others at 3,000,000 square miles. Brazil, indeed, is nearly as large as Europe. But more than one-half of it is in possession of independent Indians, who are not included in the account of the population.

Brazil was governed in much the same way as the Spanish colonies, until the year 1808, when King Joam fled from Portugal to escape the power of Bonaparte, who had taken a fancy to his dominions. He was warmly received by the Brazilians nor was their joy misplaced, for he immediately set about freeing the territory from all the marks of colonial dependence. The press was made free, newspapers established, and the ports thrown open to traders of every nation; and every thing done to promote education and industry. In 1815, also, Brazil was created an independent state, although annexed to the crown of Portugal. In 1817, some democratic insurrections broke out in Pernambuco; and although suppressed, discontent still continued, until in 1821 it was announced that the Portuguese constitution was to be conferred on Brazil. Before this, however, King Joam had sailed for Portugal, promising at his departure increased pay to all his officers and soldiers. But when he was gone, it was found he had carried off every farthing that was in the treasury, having also raised immense sums by means of treasury bills. The public indignation at this discovery, together with the suspicion that he intended again to reduce Brazil to the condition of a vice-royalty, occasioned a general call for his son Don Pedro, who had been left as regent, to become the head of the government as an independent state. This he readily complied with. In 1822, he was proclaimed emperor; and in 1825, his title and the independence of Brazil were acknowledged by his father. Then followed the war with Buenos Ayres respecting the Banda Oriental, which, at its termination in 1828, left the country destitute of all currency but paper. This excited much discontent. About the same time, the abolition of the Portuguese constitution by Miguel excited the suspicions of the Brazilians that that event was only the prelude to a similar occurrence in Brazil; nor did the language and deportment of Pedro tend at all to allay their fears. In April, 1830, the nation had become divided into constitutionalists (Brazilians) and absolutists (Portuguese); but an attempt having failed to induce the troops to declare the emperor absolute, he to all appearance joined the constitutionalists. His measures and conduct, however, continued so equivocal, that, in March, 1831, manifestations of popular excitement broke out. The extreme rigour he exercised on this occasion, and his subsequent vacillation, increased and incensed his enemies more and more; and in the April following, disturbances broke out in which many persons were killed. Pedro immediately announced a change of ministry; the public remonstrated against this, but he remained resolute; an insurrection, in which the troops joined, was the consequence; and next morning Pedro abdicated in favour of his infant son, Pedro II., and embarked from Rio Janeiro, on board an English ship of war, carrying with him an immense treasure in diamonds and jewels. A permanent regency was appointed to manage the government during the minority of the emperor; but political storms have not ceased to "lower upon this house." Insurrections are by no means uncommon in Brazil; some recent inroads of the Indian tribes have been attended with much loss of life and property. The city of Para was taken in 1836, but afterwards evacuated. Bahia was likewise captured by a rebel army of Indians and others, but wrested from them by the imperial troops with a great loss on both sides. This event occurred so late as March, 1838. A serious insurrection has recently broken out in the province of Rio Grande. The imperial troops were repeatedly defeated, and that portion of the country has declared its independence. That this will be maintained, is quite uncertain.

To describe minutely the physical characteristics of so vast a region as that of Brazil, would carry us far beyond our limits. Generally speaking, there is not on the globe a finer country, one blessed with a more genial climate, or a more fertile soil; more happily diversified with wood and water, or with abundance of navigable rivers; or more famed for its produce of gold and diamonds. Nearly the whole of the most highly valued productions of the earth are raised within its territory. The land rises by

gentle gradations from the shore to the interior, to the height of from three to six thousand feet above the level of the sea. At this elevation within the tropics, the climate is temperate, and European fruits and grains are raised in abundance. The intervening valleys have a warmer temperature, and consequently are extremely favourable to the growth of sugar, coffee, cotton, and every description of tropical produce. Magnificent forests overspread a great part of the interior. The trees are closely interwoven with brushwood and shrubs, and covered with creeping plants adorned with the most resplendent flowers, thus imparting a peculiar and rich appearance to the scenery. These forests abound in valuable woods, adapted for every purpose to which art can apply them. They are also the abodes of numerous wild animals, and of an infinite variety of the feathered tribes. The climate in the neighbourhood of the Amazon, and in the northern parts, is hot, but ameliorated by the humidity of the atmosphere; in the southern regions it is temperate, and in general healthy. The principal rivers are the Amazon, Madeira, Topayas, Xingu, Tocantins, Negro, St. Francisco, Paraguay, Parana, and the Uruguay.

Brazil is rich in mineral treasures, especially in gold and diamonds. Gold is found in the beds of most of the rivers that rise in the interior, and almost all the towns were founded by men searching for gold. Next to gold, diamonds form the staple of Brazilian mineral riches. They were first accidentally discovered about 1730. There are several large mines of nitre and iron, but no silver is found. Salt is extremely abundant, but being a government monopoly, it is always kept very high in price; a most absurd regulation in a country where it is so much required, not only for the use of man, but of cattle, poultry, sheep, and other animals, and for salting meat. The commerce of Brazil is very extensive, especially with Great Britain. Though labouring under the curse of being a slave-holding state—a condition of things incompatible with sound institutions—Brazil is yearly improving in circumstances, and exhibits very satisfactory symptoms of commercial prosperity. All that it requires, exteriorly, is liberty to trade on equitable terms with Great Britain, where its vast produce of coffee and sugar would find a market. At present it raises 60,000 tons of coffee annually, and this could be greatly increased. Brazil is well known as being the best South American customer of Britain, particularly for cotton goods. At present its imports from the United Kingdom amount to about £4,000,000 annually, and between 50,000 and 60,000 tons of British shipping are engaged in the trade, chiefly in connection with Liverpool. On Brazil coffee a duty of 1s. 3d. per lb. is now (1841) charged on admission to our market, while West India coffee is allowed to enter at 6d. per lb. This preposterous preference greatly injures our trade with Brazil, and forms a serious tax on the consumer. Brazil sugar is practically excluded, from a similar cause. The trade with France, the United States, and other countries, being on the increase, it is not unlikely that Britain may soon almost lose Brazil as a customer for her cotton and other manufactures. The imports into Brazil from the United States during the year 1835 amounted to 2,608,656 dollars, being chiefly flour; from France, to the extent of £907,330. The whole imports into Brazil may be estimated at £6,500,000. The exports, consisting of sugar, cotton, hides, coffee, tobacco, rice, leather, drugs, dye-woods, India-rubber, gold, diamonds, are estimated at £5,500,000, of which about £1,500,000 comes to Great Britain. According to the report of the finance minister, the income for the year 1838 was 13,663,289 dollars, the expenditure 13,622,000 dollars, leaving a balance of 41,289 dollars. There is a national debt of above £6,000,000. Brazil is divided into nineteen provinces, the population of which is stated to be 5,216,666 souls, of whom 2,086,666 are slaves. The form of government is that of a constitutional and representative monarchy, the imperial crown being hereditary in the male line. Four political powers are recognised—the legislative, which resides in a general assembly, consisting of a senate appointed by the emperor, and a chamber of deputies elected by the people; the executive, the managing, and the judicial, are the other three powers. In 1835, it was decreed that a legislative provincial assembly should be introduced into each of the nineteen provinces, the duration of each session to be two years. The local powers of these bodies are very considerable, approaching to those of the individual states of the North American Union. The religion of the state is the Roman Catholic, but the exercise of all others is permitted, though none are allowed to build churches or perform divine service in public. There are a great number of monasteries and nunneries in Brazil, and the clergy is numerous. Much has been done for public instruction in Brazil, a national system of education having been introduced. The press is free, but, as yet, there are few printing establishments in the country. A succession of tranquil years, it is hoped, will enable the Brazilians to make advances in literature and the useful arts.

The capital city of Brazil is Rio Janeiro, of which the population is estimated at nearly 200,000. The harbour is one of the finest in the world. The entrance to it is a narrow opening in a ledge of rocks, about half a mile wide, at the mouth of which is an island, upon which a strong fort is erected. After passing through this strait, the mariner finds himself in a magnificent gulf 100 miles in compass, encircled by lofty mountains, and enclosing a number of islands. Vessels of all dimensions may enter and anchor in perfect security. The city is on the north-east side of the bay; the streets in one part are narrow, and the whole appearance of the lower city is somewhat mean. It is, however, now greatly improved by the erection of public and private buildings. The greatest portion of the mercantile inhabitants are Portuguese. One of the most striking features of Rio, is the immense number of churches with which it is provided.

Bahia, or St. Salvador, the ancient capital, is situated on the east side of the magnificent bay of All-Saints, which extends a whole degree from north to west, branching inland in every direction, and capable of holding all the shipping in the world. The population is estimated at 120,000, so that it is the second city in Brazil. From its central situation, the commerce is very extensive. Pernambuco is the next city in size and importance, and is increasing so rapidly that new houses are built wherever space can be found, while the commerce is increasing in proportion. It is perhaps the handsomest city in Brazil, with broad paved streets, fine houses, an episcopal palace, handsome churches, convents, hospitals, theatre, &c. The population is about 62,325. Maranham is a sea-port of considerable size and trade, with a population of 27,000. Besides these are Villa Rica, Para, Rio Negro, and about twenty others of lesser importance.

PATAGONIA.

The land of Megalhaens is of great extent, occupying the whole southern portion of South America, beyond about the 40th parallel of south latitude. Its length, including Cape Horn, is above 1000 miles; but its breadth at the widest is not much more than one-third of that space, and it gradually narrows to a point at the southern extremity, where the land bends in a curve to the north. The interior of this large territory is but little known, but the more that is ascertained of it, the less does it appear likely ever to become the seat of a thriving people. It appears to be almost entirely destitute of

useful production, and quite unfitted for the residence of civilised men. Terra del Fuego is divided into three islands by two channels, and is altogether a desolate place. The inhabitants of Patagonia, so long proverbial for their gigantic stature, are now known to be little above the European standard in height, and are few in number; they possess no towns, but lead an unsettled life, somewhat resembling that of the Tartars.

To the east of Patagonia lie the Falkland Islands, the possession of which at one time nearly occasioned a war between England and Spain. They are now held by Britain, and may possibly be opened for colonial settlement. Still farther south, are the South Shetland Isles, containing not a vestige of vegetation, and covered with eternal snows. To the north-east of these is a large island, Georgia, which may be termed the throne of the southern winter, presenting nothing but rocks of ice and mountains of snow.

GUIANA.

This territory is divided into British, Dutch, and French Guiana. It is situated north of Brazil, between Cape North and Essequibo, inclusive. As British Guiana is usually comprehended under the West Indies, we shall not enter into a description of these settlements in this place. The whole district is about 600 miles in length, and has an average breadth of 250 miles.

The settlement of Cayenne, or French Guiana, was first formed about 1630, by a colony from Caen, in Normandy, after which it is called. It did not succeed. From that period down to the peace of 1814, it passed alternately into the hands of the Dutch, British, Portuguese and French, but was then finally restored to France. There are two settlements, one on the mainland, another on the island of the same name, separated from the former by the river Cayenne. The mainland is low and marshy, and the Indians in the surrounding territories are so troublesome that the settlers attend to little else than the rearing of cattle. It is on the island that all the articles of merchandise are raised, consisting of coffee, sugar, cotton, cocoa, indigo, Cayenne pepper, &c. The island is eighteen miles long, and ten broad. At the north point is the town of Cayenne, the capital of the colony, with a fine convenient harbour, and containing about 200 houses. The population of the whole colony does not exceed 25,000; and altogether it is a settlement of very little importance.

Dutch Guiana, until 1814, comprehended Surinam, Berbice, Demerara, and Essequibo; the three last were then transferred to Britain. The remaining province of Surinam is about 210 miles long along the coast, and as much broad. The soil is low, rich, and fertile, and produces sugar, rum, cotton, and coffee, for exportation. In 1831, the imports into the United Kingdom amounted only to £899, while there were no exports in return. In 1815, the population was calculated at 49,000, of whom 2000 were whites, 3000 free coloured persons, 31,000 slaves, and 13,000 free Indians and Maroons. The population at present is certainly above 60,000. Paramaribo is the capital, situated on the river of that name, with a population of from 18,000 to 20,000.

GENERAL CHARACTERISTICS—POPULATION, CHARACTER, RELIGION, CUSTOMS, &c.

Whatever may be advanced against the ritual of the Romish church, the experience of history would seem to show that it is of all the forms of Christianity the best fitted to captivate a people involved in the errors, and addicted to the superstitious observances, of heathenism, from the strong power which it exercises over the imagination. We find, accordingly, it was through the influence of the Jesuits that a compromise or friendly understanding was first effected between the American Indians and their conquerors. This union has continued to grow gradually firmer from the intercourse of their descendants, by which the physical characteristics of the two races have been amalgamated in the present brown, or rather olive-coloured population, who now constitute the great body of the Christianized inhabitants of South America. The events of the last half century have contributed powerfully to annihilate that invidious distinction of *castes*, which in other European colonies has been the constant source of mutual jealousy, envy, and heart-burning—displaying themselves in discontent and insurrection on the one hand, and oppression on the other. This gradual extinction of the observance of *caste* has naturally generated a more benevolent sympathy towards the unfortunate African negroes than is anywhere else exhibited; and, accordingly, it was one of the first objects of the patriots who threw off the Spanish yoke, to grant them their freedom. In some provinces—as those, for example, of Colombia—immediate emancipation was declared; in others, more gradually. In some parts, as in the Brazils and Guiana, slavery still exists; but the spirit of all the various governments is favourable to manumission, and universal freedom seems to be a matter neither improbable nor distant. The uniform establishment of the Roman Catholic religion throughout all the states, has also, no doubt, contributed much to produce a community of feeling and sentiment among all classes of the population, all being alike—negro as well as white—members of the church. The events of the revolution were naturally accompanied with feelings of jealousy respecting all the original institutions introduced by the Spaniards, religious as well as civil; but in the matter of religion, the odium seems to have fallen not on the church, but on the priesthood. This was more especially the case in the commercial cities, in almost all of which as complete an overturn and spoliation took place among the rich and indolent establishments of monks and friars, as during the period of the reformation in Scotland.

Generally speaking, the natives of South America are a much more active and industrious race of men than the creoles of other tropical countries. The Spanish custom of the *siesta*, or noon-sleep, is universally prevalent; but both before and after that period of repose, they are actively engaged either in transacting business, or in giving and receiving visits, attending public exhibitions, promenading, making short journeys of pleasure, &c. As among the whites in the West Indies, universal hospitality prevails, every man's house being a home to the traveller; and this is the more necessary from the scarcity and bad provisions of the inns. The manners of the inn-keepers and their servants resemble those in the United States, where both sit down at table, and converse familiarly with their customers. The staple dish throughout South America, both at inns and in private houses, is the *olla*, consisting of boiled or stewed beef, covered with *friolas* and other vegetables. In these places of refreshment, too, travellers of all ranks and characters dine at the same board, and take their siesta in the same room, upon mats spread down for the purpose. Travellers of respectability generally endeavour, however, to stop at the houses of proprietors near the wayside, who live in a style of wealthy ease and luxury.

The Spanish amusement of bull-baiting is pursued with great avidity by the South Americans. But perhaps a more demoralizing and pernicious amusement is the besetting vice of gamoling, in which all classes in the town indulge to a great extent. The method of catching the wild cattle that rove in immense herds over the *pampas*, is a practice altogether peculiar to the South Americans. The instrument used is called a lasso, from the Spanish *lazo*, signifying slip-knot or noose, and the operation of using it is called lassoing. It consists of a rope made of strips of untanned hide, varying in

length from fifteen to twenty yards, and is about as thick as the little finger. It has a noose or running-knot at one end, the other extremity being fastened by an eye and button to a ring in a strong hide-belt or surcingle, bound tightly round the horse. The coil is grasped by the horseman's left hand, while the noose, which is held in the right, trails along the ground, except when in use, and then it is whirled round the head with considerable velocity, during which, by a peculiar turn of the wrist, it is made to assume a circular form; so that, when delivered from the hand, the noose preserves itself open till it falls over the object at which it has been aimed.

Wild horses are captured with what is called, in the language of the Gaucho, "las bolas," or balls—a most formidable weapon in the hands of him who knows how to use it. It consists of three thongs or cords of hide, each more than a yard long, having balls attached to the extremities. The "bolesdor," or he who is going to fling the balls, takes one ball in his hand, and swinging the others rapidly round his head, throws "las bolas" with all his might, and unerring certainty, round the hind legs of his victim, which immediately comes to the ground.

Spanish is of course the language spoken in all the republican states of South America. At Panama, however, Captain Hall was surprised to hear the whole inhabitants, white, brown, and black, talking good English. This arises from the constant commercial intercourse kept up with Jamaica across the isthmus.

COMMERCE OF SOUTH AMERICA.

It is impossible for us to give any probable estimate of the present state of South American commerce. The capabilities of this vast continent for a trading intercourse with foreign nations are perfectly incalculable as to value and extent. Having, therefore, briefly stated, in our notice of the various provinces, the principal articles of import and export from each, we will here give the published official report of the entire commerce between South America and Great Britain, for the year ending January, 1831, and from it a guess must be made at the entire traffic of the former with foreign nations:—

OFFICIAL REPORT of the ENTIRE COMMERCE between SOUTH AMERICA and GREAT BRITAIN for the year ending January, 1831.

	Official value of imports into the United Kingdom.	Official value of Exports from the United Kingdom.		Declared value of British and Irish produce & manufactures exported from the United Kingdom.
		British & Irish produce and manufactures.	Foreign and Colonial merchandise.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brazil	1,230,557 19 5	4,270,749 18 1	45,457 19 7	2,452,103 3 11
States of Rio de la Plata	583,946 12 7	1,067,884 1 0	12,679 11 1	622,171 15 8
Peru	85,254 14 10	513,504 14 11	15,569 13 2	305,469 6 11
Colombia (i.e. Grenada, Venezuela, and Quito)	52,869 13 4	427,719 2 0	5,854 1 2	216,751 8 10
Chili	25,074 17 10	833,566 0 8	23,094 6 0	540,636 1 11
Guiana: Demerara and Essequibo	1,627,090 19 6	419,263 8 11	31,573 3 5	426,316 3 8
Berbice	370,935 6 8	88,556 11 4	6,583 14 3	69,442 0 6
Cayenne	10,493 15 5	11,221 9 8	36 7 8	11,458 0 0
Surinam				
Total	£ 4,387,492 19 4	7,612,963 6 7	141,456 18 10	4,717,366 1 5

MINES AND MINERALS.

Having under the various heads alluded to the mines and minerals peculiar to each district, we reckon it unnecessary to do more here than to show at one view the quantity of the precious metals which have been extracted from the mines of Spanish America and Brazil. The estimate is made by Humboldt, from the registries of the various mints, and making allowance for the contraband traffic:—

Spanish America.	*Dollars.*	*Pounds sterling*
Produce of the Mexican mines, to 1800,	2,107,270,511	£474,135,866 0 0
Produce of the mines of New Granada, to 1803,	275,000,000	61,875,000 0 0
Produce of the mines of Chili, to 1803,	138,000,000	31,050,000 0 0
Produce of the Peruvian mines, to 1800,	891,358,595	200,555,684 0 0
Produce of the mines of Potosi (Bolivia), to 1803,	1,476,372,174	332,183,739 7 6
Total produce, registered and unregistered, of Spanish America,	4,888,001,280	£1,099,800,289 7 6
Portuguese America.		
Produce of the Brazilian mines from 1695 to 1803, registered & unregistered,	855,000,000	192,375,000 0 0
Total produce of the American mines to 1803 and 1806,	5,743,001,280	£1,292,175,289 7 6

So much has the mineral produce of the Mexican mines diminished, consequent on the destructive intestine warfare which so long afflicted that unfortunate country, that it does not now exceed 10,000,000 dollars, instead of £27,000,000, as in 1805. From 181[illegible] to 1826, the collective produce was only 168,297,400 dollars. The coinage of the Mexican mint, for 1827 and 1828, amounted to 5,700,853, and that of the four provincial mints, for these same years, 6,001,74[illegible] dollars. Total produce in eighteen years, from 1811 to 1828, 179,999,990 dollars, or 10,000,000 annually. According to an official document, the coinage of all the mints in 1834 was 12,040,811 dollars; but it is calculated that gold and silver were shipped from Mexico during the same year to the extent of £5,000,000, which shows a considerable rise. The Chilian mines, which produced annually 2,060,000 dollars, registered and contraband, prior to the revolution, and which even in 1817 produced a coinage of 1,161,283 dollars at the mint of St. Jago, fell in 1824 to 193,000 dollars, or only one-sixth of the coinage of 1817. But it has since risen even above its old standard. During the year 1831, there was shipped from the ports of Chili, gold, silver, and copper, to the amount of 2,379,539 dollars. The quantity of gold produced by the mines is, besides, stated to be much greater than appears from official documents. According to parliamentary returns, the gold coined at the mints of Lima and Cuzco, from 1820 to 1833, amounted to 2,138,870 dollars, and of silver to 27,825,286 dollars. At the different smelting-houses throughout the republic of Peru, the silver reduced to bars in 1833 amounted to 2,562,242 dollars, or about half a million sterling, and the gold to about £30,000 sterling. Still later returns show that the working of the silver mines in that country is at length proceeding with increased spirit, activity, and success. The Quicksilver mine of Guancavelica in Peru, the only one of this kind in the New World, and which formerly yielded about 8000 quintals of mercury annually, is now very nearly exhausted. The silver mines of Potosi, now included in the territory of Bolivia, have yielded since their discovery in 1545 upwards of 1300 millions of dollars. These are still considered the richest in South America, but great ignorance of mining operations is displayed in working them. Indeed, this remark is applicable to the whole mining business of South America, or was till very lately. What Potosi may now produce yearly, it is difficult to state with any degree of accuracy. When Temple visited the depart

sent in 1828, the mines were only wrought to the extent of £125,000 annually; other accounts say double that sum, and they must certainly have at least risen to half a million since then. The mines of New Granada, which formerly yielded 3,000,000 of dollars annually, are now much fallen off.

The gold and diamond mines of Brazil are not the profitable speculation which they once were. The process of procuring diamonds may rather be termed washing than mining. They are found in the beds of rivers among the mud, which is placed in a range of troughs into which a stream of water is introduced.

In concluding our sketch of the South American continent, it is impossible to avoid expressing a regret that such an extensive and productive region of the earth should have had the misfortune to fall under the domination of Spain, and other unimproving nations of Europe. From this cause, bigotry, sloth, vice in all its most hideous aspects, and an enmity to human improvement, have been engrafted on the social condition of the people, no matter what be their form of government, and ages must elapse before they can compete, in civilization and its innumerable advantages, with their more fortunate and enlightened brethren in the northern continent.

DESCRIPTION OF THE WEST INDIES.

The name of the *West Indies* is given to a huge belt of islands, stretching in the form of a curve between the continents of North and South America. They may be, in general terms, described as running in a south-east direction, from the coast of Florida on the former continent to the Gulf of Paria on the most north-eastern point of the latter, presenting a sort of convex breastwork to the Atlantic Ocean. They are *nautically* classed by the British under two great denominations—*Windward* and *Leeward*. The former are the more northern of the group, the latter the more eastern and southern, and include those properly termed the Carribean Isles. The latter, again, are themselves divided into *Leeward* and *Windward*, as will be seen by the map annexed to this article. St. Domingo (or Hayti) is the most southern of the Windward Islands; Porto Rico the most northern of the Leeward. Looking at the map, it would seem that these two divisions had derived their distinctive appellations from their relative position to Jamaica. Thus, in returning to Europe from that island, the navigator either holds at first a southerly course across the Carribean Sea, and through the cluster of isles so called, until, having attained the proper degree of southerly latitude, he changes his tack, and slants right across the Atlantic with a side wind, when he catches the western breeze off the coast of Newfoundland, which enables him to run down upon any desired point of the continent of Europe; or he at once beats direct up to the eastward against the trade-wind, by short tacks, the line of the latter course subtending (to speak mathematically) the angle described by that of the former. These two courses of navigation are respectively termed the *leeward* and *windward* passages. It must be observed, however, that the French and Spaniards affix different meanings from the British to these terms, and apply them respectively to the relative position of the various islands.

That portion of the ocean which is thus in a manner separated from the main body of the Atlantic by this huge chain of islands, and contained between them and the respective shores of North and South America (which are connected by the narrow Isthmus of Darien), is also divided into three great basins—the more northern one being called the Gulf of Mexico; the middle one, the Bay of Honduras; and the southern one (as already noticed), the Carribean Sea. The latter takes its name from that class of islands which bound this part of the ocean to the east, originally inhabited by a nation of cannibals denominated Carribs or Charaibs, and from which Columbus afterwards styled their possessions the Carribean Islands.

The Gulf of Mexico is almost completely separated from the other two basins, by the near approximation of the southernmost point of the island of Cuba to the northernmost part of the coast of Yucatan, South America. The channel between these two points is so shallow that it is supposed they must have been at one time connected.

DISCOVERY.—NATIVE INHABITANTS.

These islands were first discovered by Columbus, when engaged in his adventurous attempt to find out a western passage to India. It was from this circumstance that he gave them the name of the Indies, which, after the Cape of Good Hope was doubled by the Portuguese, was changed to that of the Indies of the West, and this name they have ever since retained. Some of the older navigators and writers, however, designated them the Antilles, by which even some modern geographers distinguish them. They are, however, best known under their original designation, and by this we shall continue to call them.

The first land discovered was the Bahama Islands, the most northern of the group, in the year 1592. Columbus afterwards visited Cuba, Jamaica, St. Domingo, and most of the Carribean, or, as they are geographically termed, the Leeward and Windward Islands.

Respecting the inhabitants found in the West India Islands by the early voyagers, it is impossible to trace their origin with certainty, although it is most probable that they came originally from the continent of America. There appears to have been at least two distinct tribes inhabiting these islands at the period of their discovery, between whom a marked distinction existed in language, manners, and appearance. The most warlike and powerful of these tribes was that of the Charaibs, or Carribs, who are supposed to have come from the southern continent, as similar tribes of Charaibs were found to exist in Guiana by subsequent voyagers. The Charaibs always manifested the most sanguinary spirit, and continued for ages to be the scourge of the other inhabitants of the islands. They seemed to consider war as the prime occupation of their lives, and although cruel to their prisoners, they manifested the greatest affection for each other. Like most savage nations, they seem to have possessed a strong repugnance to every species of subordination, neither kings, magistrates, nor laws, existing among them. Their

frames were robust, muscular, and active; but they disfigured their faces with paints and dyes in the most extravagant manner, and even made deep gashes in their faces, to render themselves more hideous. The children were early initiated into the barbarities of their parents, being taught to feed upon the bodies of prisoners captured in war, and to anoint themselves with the fat of their victims. On arriving at the age of manhood, the youth were subjected to dreadful tortures, in order to prove their fortitude, and powers of endurance; and when any one aspired to the dignity of chief, he was subjected to even greater tortures before the honour was conferred upon him. They took as many wives as they wished for, or were able to maintain, and the women were treated with great brutality, and subjected to every species of domestic drudgery and labour. The Charaibs were likewise addicted to that most disgusting and brutal practice, so common among [illegible]

of tropical climes, of flattening the heads of their offspring. Notwithstanding these barbarities, the Charaibs, at the period of their discovery, had attained some proficiency in many kinds of manufacture. Columbus observed abundance of substantial cotton cloth in all the islands he visited, which the natives dyed of various colours. Of this cloth they made hammocks, or hanging beds, such as are used at sea, both name and pattern having been adopted by Europeans. These savages also formed various vessels of clay, some beautiful specimens of which have been dug up in Barbadoes and other islands. Their religion was a compound of idolatry and superstition; but they believed in the existence of a Deity, and in a future state.

The inhabitants of the larger islands of St. Domingo, Cuba, Jamaica, and Porto Rico, presented the most striking contrast to the Charaibs. They were indolent and sensual in their habits, but mild and forgiving in

disposition, affectionate to their wives, and seem to have been of a domestic turn of character. They were particularly fond of dancing and various other peaceable amusements and games. Their form of government was monarchical, the kings being called *caciques*, and their power hereditary. Subordinate chiefs or princes governed each district, who were tributary to the king. They had likewise an established priesthood; but their religion consisted of the usual savage superstition. They, however, believed in the existence of a Deity, and a future state of rewards and punishments. These simple people showed great kindness to Columbus and his companions while visiting their islands, believing them to be a species of superior beings; and observing the avidity of the Spaniards for gold, they gave them all they possessed. A remarkable speech has been preserved, which an old man, a native of Cuba, addressed to Columbus when presenting him with a basket of fruit. The speech shows the quiet disposition of the people, and their profound veneration for their white visiters. "Whether you are divinities," said he, "or mortal men, we know not. You are come into these countries with a force against which, were we inclined to resist, resistance would be folly. We are all, therefore, at your mercy; but if you are men, subject to mortality like ourselves, you cannot but know that after this life there is another, wherein a very different portion is allotted to good and bad men. If, therefore, you expect to die, and believe with us that every one is to be rewarded in a future state according to his conduct in the present, you will do no hurt to those who do no hurt to you." It was upon these simple people that the Spaniards afterwards perpetrated the most barbarous cruelties, which ultimately extirpated the whole race.

NUMBER OF ISLANDS.—PRESENT POSSESSORS.

No actual survey of the West India Islands having ever been made, it is impossible to state with certainty their actual number. It must, however, be very great, from the fact that the Bahamas alone amount to five hundred. A great proportion of these are uninhabitable rocks, which generally furnish fine water; and being possessed of good natural harbours, afford shelter for ships in the event of storms. We shall only enumerate the principal colonial possessions belonging to the British and other European powers, and the free native settlements, with a short historical and topographical sketch of each; and then proceed to give a general view of their appearance, productions, climate, inhabitants, government, trade, &c. The first in point of importance, both as to number and value, are the

BRITISH POSSESSIONS.

1.—JAMAICA.

This is the third island in point of size in the western hemisphere, being inferior only to Cuba and St. Domingo. It lies about one hundred miles south of the former, and about ninety west of the latter. Jamaica is situated between latitude 17° 35′ and 18° 30′, and 76° and 78° 40′ west longitude. It is 160 miles long, 45 broad, and contains 4,000,000 acres of land. This island was discovered by Columbus during his second voyage, and was well populated at that period. The natives opposed his landing at first, but he soon effected a reconciliation with them, and took possession of the island in the name of his sovereign. It was not, however, until his last voyage that a settlement was formed on the island; and this arose from his being obliged by tempestuous weather to run his ships ashore. Columbus stayed on the island for twelve months; and after enduring great hardships, he was rescued, and died soon after his return home. In 1509, the son of Columbus despatched Juan de Esquivel to take possession of the island as deputy-governor, and the colonists for many years were engaged in perpetual warfare with the natives. The Spaniards committed great atrocities on the Indians, whom they at last completely extirpated, not a single native being left alive when the English took possession of the island in 1655, nor, it is said, for a century before. The traditionary accounts of the cruelties inflicted by the Spaniards upon the natives are truly revolting; who, instead of retaliating, soon sunk into the condition of slaves, and hard treatment at last effected their complete destruction. The first regular settlement was fixed upon the banks of a small rivulet, called Seville Nueva. Here a town was built, of which, however, nothing now remains but the name, it having been destroyed by French Buccaneers. During the period the Spaniards held possession of Jamaica, they appear to have made some advancement in agriculture; but their rapacity for gold, which they were constantly in search of, prevented any great improvement in this department. They, however, cultivated the sugar-cane, the vine, and the cotton-tree, and introduced cattle from Europe. The Buccaneers made frequent descents on this island, and committed great depredations both on the Spaniards and Indians. It was twice taken and plundered by these rovers; but no regular attack was made by any European power until 1655, when an expedition was sent against Jamaica by the English government. It arrived in the month of May; and so expeditious and successful were the operations, that the fleet was enabled to sail for England in the following month. For some time after, however, little progress was made in the cultivation of the land, the Spaniards having fled to the mountains, from whence they attacked the colonists at every fitting opportunity. Cromwell greatly encouraged the settlement of this island; and in the course of a few years, the number of whites amounted to 4500, and 1400 Negroes. The population rapidly increased, the settlers being principally soldiers from the disbanded parliamentary army, and outlaws from the mother country. Large importations of Negro slaves also took place, which in 1688 were calculated to amount to 10,000 annually, and from that time the population has gradually increased.

Jamaica has been subjected to several dreadful earthquakes; one of which, in 1692, caused almost the entire loss of the town of Port Royal. Only about two hundred houses in the fort stood after the shock; and about three thousand inhabitants are estimated to have lost their lives on this occasion. Port Royal was also reduced to ruins by fire in 1703; and a similar catastrophe took place so recently as 1815. It was also much injured in 1722 by one of those dreadful hurricanes so frequent in tropical climes. The sea, during this hurricane, completely inundated the town, 400 persons perished, and twenty vessels were destroyed in the harbour. The white inhabitants have been repeatedly in danger from the revolts of their slaves, which were the occasions of much bloodshed and cruelty on both sides. The slaves are said to have been at first instigated to rebellion by the Spaniards; but being defeated by their English masters, they fled to the mountains, assumed the name of Maroons, and continued for nearly a century and a half in constant hostility with the colonists. The most remarkable rebellion broke out in 1795, and which has been known since by the name of the Maroon war. The blacks at first obtained many advantages over the English; inciting their slaves to revolt, and committing the greatest cruelties upon the whites. The rebellion lasted for about seven months, from the Maroons having possession of the mountains, where no troops could reach them. The mode of warfare was quite in the Indian style; never facing their foe openly, but lying in ambuscade, and cutting off detachments and stragglers. The whites were at last compelled to import bloodhounds from Cuba, to assist them in this warfare; and this, which at

first sight appears a great cruelty, was in reality the most humane action of th.. war. Not a drop of blood was spilt after these dogs were employed; and the ambuscades of the Maroons being discovered by the sagacity of the animals, they were soon subdued. From the revengeful disposition of these people, it was judged expedient to break up the community; and six hundred were accordingly shipped off to Nova Scotia, and land purchased for them at the expense of the island. No other event occurred to disturb the peace of Jamaica until 1831, when an extensive revolt took place from the exaggerated hopes of the Negroes for emancipation. It is remarkable, that during this revolt, although much property was destroyed, no personal violence was offered to any white person, beyond a few hours' captivity. Since the passing of the Emancipation Act, no disturbances of any importance have taken place, although the Negroes in some places have struck work. In all likelihood they will remain quiet, although years must elapse before they are brought into such a state of intelligence as fully to understand their real position.

Jamaica is of an oval shape, and it presents a greater variety of scenery and climate than any other island in the West Indies. A range of mountains, called the Blue Mountains, runs from one end to the other, and rises in some parts to the height of nearly eight thousand feet above the level of the sea. These are again occasionally intersected by cross ridges running north and south. At the south end, near the sea, these mountains are in some parts covered with forests, high and abrupt in appearance, and difficult of access. On the other side the hills rise with a gentle acclivity, and are separated from each other by vales, the vegetation of which is described as extremely beautiful. The view of the island from the sea has been long celebrated for its splendour; the mountains sometimes appearing above the clouds, and studded with forests. The great savannahs or plains are covered with the most beautiful pasture, woods, and all the magnificent vegetation of the tropics. The mountains in some parts reach a great height; Blue Mountain Peak being 7770 feet above the level of the sea; Portland Gap Ridge 6501; Catherine's Peak 4970; and others of a lesser elevation. Some authorities assert, that at the eastern part of the island, three peaks of the grand ridge of the Blue Mountains reach the heights of 8184, 7656, and 7576 feet above the level of the sea. The mountains are generally of a conical form, very steep, and approaching on the north side very near to the sea. The deep ravines between the lofty mountains are densely covered with woods, and are denominated cockpits. These offer a striking contrast to the lower mountains, where the coffee-plant, pimento, cotton, &c., are cultivated. On the south side, the mountains are situated a little distant from the sea, leaving plains of about twelve miles wide.

There are numerous rivers in Jamaica, two hundred of which have been enumerated; but none, owing to the irregular nature of the country, are navigable for vessels of any burden. Black river is the largest; and running through a flat country, is navigable for vessels of small tonnage for about thirty miles. The only other rivers of any note are the Rio Cobre and Rio Minho on the south, and the Marthabrae, White, Ginger, and Great River on the north side. These rivers are extremely valuable in the cultivation of the soil, the great height from which the water runs allowing it to be carried a considerable length in irrigating the country, and turning mills upon plantations. The rapidity of the current also prevents it from stagnating; and thus it is kept pure for animals to drink, from its source to the ocean. There are numerous springs and rivulets throughout the country, several of which are of a medicinal nature. Two sulphureous springs, one hot and the other cold, are very celebrated and exceedingly beneficial in cutaneous diseases. There are sixteen principal harbours which afford secure havens for shipping, and thirty bays or roads with good anchorage.

The soil of the country is generally deep and fertile, presenting a shining appearance to the eye when first turned up. In some parts it is of a chocolate colour, in others a bright yellow, and even scarlet. The best soil for cultivation is what is termed the brick mould, which is of great depth, so rich as to require no manure, and of a quality which seems well suited for the climate. It is so far retentive, that in dry weather it retains enough of moisture for the preservation of the plants, and so porous as to admit of the superfluous water sinking through it during heavy rains. This soil is composed of clay, sand, and black mould, and is thought the best soil in the island for the cultivation of the sugar-cane. The next soil in point of fertility is the black shell mould; and there are many varieties throughout the island, all more or less fitted for cultivation. Silver and gold mica frequently occur in the soil, and the latter is sometimes mistaken for gold dust. No gold has ever been discovered, however, although it is certain that the natives were possessed of plenty when the Spaniards first visited the island. A rich lead ore is found in some parts of the country, which is impregnated with silver. This ore is worked at Liguana; and varieties of copper, striated antimony, and iron-stone, have also been obtained in some parts of the island. White freestone, quartz, limestone, and a species of bastard marble, also occur in considerable quantities.

Jamaica is divided into three counties, Middlesex, Surrey, and Cornwall. Middlesex is divided into nine parishes, Surrey into seven, and Cornwall into five. The seat of government is Spanish Town, in the county of Middlesex, situated at the extremity of an extensive plain. The mountains closely approach the town, and the river Cobre runs past it, at the distance of about a quarter of a mile. The town is not large, but the buildings are very magnificent, being built in the style of Spanish architecture. The finest building is the governor's residence, called King's House, which occupies one whole side of a quadrangle. Kingston is the most important town in the island, and is generally considered as the capital, although not nominally so. It is situated upon a gentle inclined plain, which is enclosed on the north by the Liguana ridge of mountains. These mountains form a sort of semicircle, and the plain stretches down to the harbour, which is amongst the finest in the world. It affords excellent anchorage all round, and the largest merchant ships can ride close in shore. This harbour is defended by numerous batteries, and is considered perfectly unassailable from the sea. The streets of Kingston are built with the greatest regularity, somewhat in the style of the New Town of Edinburgh. The houses are principally of wood, and, in general, two stories high, with verandas above and below. The English and Scotch churches are very elegant buildings, particularly the former. It contains about 40,000 inhabitants, of whom 12,000 are whites, and the rest people of colour. There are excellent markets for butcher meat, fish, and vegetables of every description. On a plain at the top of the declivity on which the town is situated, stands a fine range of barracks, called Up-Park Camp. This camp is situated about two hundred feet above the level of the sea, and is capable of accommodating upwards of twelve hundred men. There is an excellent hospital attached to the barracks, and a bath, which, only four feet deep, is capable of containing 70,000 gallons of running water. Montego Bay, situated on the opposite side of the island from Kingston, is a seaport of some importance. It lies at the foot of a range of mountains which nearly surround the town, and possesses a neat church and commodious barracks. Falmouth is situated about fifteen miles east of Montego

and is rising rapidly to importance. The harbour in the inside is deep and well sheltered, but the entrance is intricate, and not more than seventeen feet deep across the bar. The town is built on the west side of the harbour, and possesses several good public offices, a free school, and commodious barracks. There is more produce shipped from this port than from any other in the island after Kingston. Savannah Le Mar is a fine healthy military station, situated in Westmoreland parish. The town is built upon the beach, the harbour of which is good, and the barracks are situated about a mile from the town, in the midst of a highly cultivated country.

The government of Jamaica consists of a governor, a council of twelve, and a house of assembly. The governor has the chief civil and military authority, and he holds his appointment from the home government. The members of the council are selected from amongst the justices of the peace by the queen; the lieutenant-governor, attorney-general, and bishop, being members by right of the offices they hold. The house of assembly consists of forty-five members, two being sent from each parish, and one additional from each of the towns of Kingston, Spanish Town, and Port Royal. There is also a supreme court, an assize court, a court of common pleas, which sit at stated times for the punishment of crime. The military force of the island consists of about three thousand regular troops, some of which are people of colour; and the militia force, which amounts to from sixteen to eighteen thousand men. All white males, from the age of fifteen to sixty, are obliged to enlist in the militia service, and no substitutes are allowed.

II.—TRINIDAD.

This island, the next in importance to Jamaica of the British West India possessions, is favourably situated at the mouths of the large river Orinoco. It lies between latitude 9° 30′ and 10° 51′, and longitude 60° 30′ and 61° 20′; being separated from the continent of South America by the Gulf of Paria. It is 90 miles long and 50 broad, with an area of 2400 square miles, and was discovered by Columbus in 1498. The island was colonized by the Spaniards in 1588, and at that time was well populated with Carribs, who were of a mild disposition and industrious habits. The native inhabitants, however, were soon either destroyed or sent to the continent of America to work in the mines by the Spaniards. The island belonged to Spain until 1797, when it was taken by the British, and has ever since remained a colony of this country.

Along the south and north sides of this island, run two ridges of mountains, extending nearly across the country, and along the north shore, giving it the appearance, at a distance, of being nothing but an immense line of rocks. The western side, for some distance, is flat, richly wooded, and is described as presenting a most beautiful appearance. The high mountains of Cumana, on the American continent, are visible from this side; and when viewed from a height, with the Gulf of Paria, and the beautiful verdure of the island, present a picture which is scarcely to be equalled. The centre is diversified with many finely wooded hills, and valleys of the greatest fertility. The highest land lies on the north side, and in some parts reaches 3000 feet in height. The other mountains are not of any great elevation, but they are all thickly covered with wood and pasture. There are numerous rivers in this island, several of which are navigable for ships of some size. The principal are the Caroni on the west coast, which is navigable for six leagues; the Nariva on the east coast, which has been found deep enough to float a vessel of 250 tons at less than a league from its source; and on the south is a fine river called the Moruga. The best harbour in the island is that of Port Royal, after which Port of Spain, which has the most extensive bay in the world; and all around the west coast there are numerous bays, which afford good anchorage for shipping. Several craters exist in Trinidad, some of which give occasional indications of not being quite extinct. Mud volcanoes also occur, the largest of which is 150 feet in diameter. The mud never overflows, but remains always within the surface of the crater; and when one crater ceases to act, another appears in its vicinity. The celebrated pitch lake is situated on a small peninsula, about eighty feet above the level of the sea. The pitch has usually the appearance of pit coal, but is gray in colour and somewhat hard, except in very hot weather, when it becomes liquid to a small depth. This substance has been used in many parts of the island with success for the improvement of the roads, and is thought well adapted for painting ships' bottoms. The lake is about a mile and a half in circumference, with several small islands covered with trees, and the country around is wooded to its banks. There are occasional symptoms of boiling observable in this lake, but no account of its ever having boiled over exists. The soil of Trinidad, generally speaking, is good; the only barren parts being the sandy plains, and these occasionally afford pasturage for cattle. It is thought that the mountains might be cultivated to their tops, but there being abundance of low ground, this is not likely to take place for many years. The sugar-cane, coffee, and cocoa, are cultivated to a considerable extent, and the produce is increasing very rapidly. Several spices have also been introduced, such as the nutmeg, cinnamon, and clove, and these by some are thought equal to what are produced in the East Indies.

The capital of the island is Port of Spain, which is said to be one of the finest towns in the West Indies. The streets are wide, and intersect each other, so as to catch every breeze. The houses are all built of stone, none being allowed to be erected of wood. The Protestant church is a beautiful edifice, and the St. James's barracks and the market-place are both commodious buildings. There are also numerous other ports around the island, which are gradually rising in importance with the increasing produce of the country. The government is in a manner despotic, being vested in a governor and council, but with no representative assembly. The powers of the governor are absolute, for he may either act upon the advice of the council or not as he pleases. The militia is the best disciplined of any in the whole of the West India Islands, and consists of between four and five thousand men.

III.—TOBAGO.

This island is about thirty-two miles long and twelve broad, and is the most southerly of the West India Islands. It is about six miles distant from Trinidad, at the east end, and about sixty miles from Grenada. Tobago was discovered by Columbus in 1496; and in 1580 it was taken possession of by the English. It was afterwards settled by some Dutch colonists; and after many takings and retakings, it was ceded to Britain at the peace of 1763. In 1781 the island was captured by the French, but retaken in 1793 by the British, with whom it has ever since remained.

The appearance of this island from the north is gloomy and mountainous, being principally composed of conical hills and ridges, which in some parts reach the height of 1800 feet. The north-west is the least mountainous, and the south is diversified with occasional hills and rich valleys. There are a number of small streams, which, rising in the hills, water the low country down to the sea. The natural harbours in this island are numerous, and several of them adapted for ships of the largest class. The principal are Man of War, Courland, Sandy Point, and King's Bays, besides numerous others, affording good anchorage for vessels of small

tonnage. The chief town is Scarborough, situated on the south-west side. It is built without much regard to regularity, and is about half a mile from Fort King George, the principal military station. The soil is rich, and the produce as varied as that of any of the other islands. It is ruled by a governor, council, and house of assembly.

IV.—GRENADA AND ITS DEPENDENCIES.

This beautiful island is situated between 12° 30′ and 11° 58′ latitude, and 61° 20′ and 61° 35′ longitude. It is about sixty miles from the American coast; twenty-five miles long, and twelve at its greatest breadth, and containing 80,000 acres of land. This island was discovered by Columbus in 1498, but was not settled till 1650, when a party of French from Martinique took possession of it. It was taken from the French by the British in 1762; again retaken, but finally ceded to this country in 1783. The face of the country is mountainous, and extremely picturesque. The island is traversed from north to south by one irregular ridge of mountains, which at some parts reach the height of 3000 feet above the level of the sea. There are a number of rivers, none of which are of any great importance for commercial purposes, but all useful for irrigating the country. Several hot springs exist, some of which are hot enough to boil an egg. A fresh-water lake, two miles and a half in circumference, is situated at an elevation of 1740 feet above the level of the sea, and surrounded with hills. This island is divided into six parishes, of which the principal is St. George. The capital is the town of St. George, situated within an amphitheatre of hills. The houses are well built, of stone or brick, and the streets wide and well ventilated. The harbour is spacious, protected on all sides from hurricanes, and is said to be capable of containing a thousand ships. Cotton was formerly the chief article produced on this island, but sugar, cocoa, and coffee are now also cultivated. The government consists of a lieutenant-governor, council, and house of assembly.

The Grenadines are a group of small islands running towards St. Vincent, the largest of which are Carriacou, Becquia, Canuan, &c. Several of these islands are inhabited, and produce sugar, cotton, fruits, live-stock, &c., in great abundance.

V.—ST. VINCENT AND ITS DEPENDENCIES.

This is thought the most beautiful of the Carribean islands; it was discovered by Columbus in 1498. It is about twenty-four miles long and twenty broad; fifty-five miles west of Barbadoes, and about the same distance from Grenada. This island was first settled by the French; captured by the British, and retaken; but finally ceded to this country in 1783. Its character is decidedly volcanic, traces of strata which have undergone the action of fire being everywhere visible. The mountains are high and sharp at the top, running from north to south with [illegible] valleys between. The soil is of a strong loam in the valleys, but assumes a more sandy nature on the hilly ground. In 1812, St. Vincent was visited by a severe volcanic eruption, the matter from which nearly covered the whole surface of the island; some particles even reached Barbadoes; and the noise was heard for three hundred miles. The damage done to the island was not great, but fifty persons lost their lives on the occasion. The island is divided into five parishes, of which the principal is St. George, in which the capital, Kingston, is situated. The houses of the town are built of stone in the lower stories and wood in the upper; and there are many commodious public buildings, but none of them of any great elegance. There is a famous botanic garden about one mile from Kingston, occupying about thirty acres of ground, and containing a fine collection of tropical plants. The most celebrated object in this island is the Souffriere, a volcano, the crater of which is three miles in circumference, and five hundred feet in depth. The climate is thought very healthy; but hurricanes are frequent and sometimes very destructive. This island is governed much in the same manner as Grenada. There are eight small islands adjoining to St. Vincent, which are cultivated; but they are not of such importance as to warrant particular mention.

VI.—BARBADOES.

This is the most easterly of the Carribean islands, and was the first settlement made by the British in the West Indies. It is about twenty-two miles in length, and fourteen in breadth, containing an area of 106,470 acres. The period of the discovery of this island is unknown, the first mention made of it being in 1600. It was colonized by the British in 1625, Charles I. having made a grant of it to the Earl of Carlisle, who encouraged emigration to the island. A society of London merchants accepted of 10,000 acres on certain conditions, and sent out a governor of their own. After this the settlers increased very rapidly; and in 1650 it was computed that there were upwards of twenty thousand British in the island. During the Commonwealth, an armament was fitted out by Cromwell against Barbadoes, for adhering to the royal cause, which committed great depredations against the inhabitants; and since this time the population has rather decreased. The island is generally level, except in the north-east quarter, and here, in some parts, the hills reach the height of 1100 feet. It has a beautiful appearance, from the land being well cultivated and the vegetation luxuriant. The soil is good, varying from a rich deep mould to a light sand, and a red clay of considerable depth is occasionally found. There are a number of springs in the island, one of which casts up a bituminous matter called Barbadoes tar, and another emits a stream of sulphureted hydrogen gas, which can be ignited. Oxen, horses, and other cattle, are plentiful, the first being most generally used for labour. Considerable numbers of hogs and poultry are reared; and, indeed, this island is distinguished from most of the West India colonies by the quantity of provisions which are raised, the inhabitants depending little upon foreign supplies. Plovers, curlews, wild-duck, teal, and other water game, frequent the coast in great numbers, and afford an agreeable article of food.

Barbadoes is divided into five districts and eleven parishes, and contains four towns. Bridgetown, the capital, is situated on the shores of Carlisle Bay, and contains about twenty thousand houses. The town is well laid out, many of the houses are very handsome, and spacious barracks occupy the southern extremity. The climate is considered healthy, but would feel extremely hot were it not for the constant trade-winds. The island is subject to hurricanes, one of which, in 1780, laid waste its whole extent. The loss of lives on this melancholy occasion was estimated at three thousand, and property valued at upwards of a million was destroyed. The island is ruled by a governor, a council, and house of representatives. The powers of the governor are entirely negative, he being only entitled to recommend measures to the assembly, which they may either adopt or reject. Barbadoes seems to have reached the height of its prosperity at the end of the seventeenth century, and since that time the population has in some measure decreased. In 1670, the white population was estimated at 50,000, and the blacks at 100,000, while at present the whole population does not exceed 90,000.

VII.—ST. LUCIA.

This island is situated in latitude 13° 50′ north, and longitude 60° 58′ west. It is about thirty-two miles

long and twelve broad. The English were the first who made a settlement in this island, but the colonists were completely destroyed by the natives. It was again settled, and since that time has passed repeatedly from the British to the French, until 1803, when it was captured by the British, in whose possession it has ever since remained. This island is traversed longitudinally, or from north to south, by a ridge of lofty mountains, which terminate in most fantastic sharp points. These mountains are densely wooded, and at times, from the attraction of the trees, are completely enveloped in clouds. The approach to the island from the south is very remarkable. Two rocks, called the Sugar-Loaves, rise perpendicularly out of the sea, tapering away towards the summit. These rocks are covered with vegetation, and stand at each side of the entrance to a beautiful bay. On the west coast, there is an excellent harbour, called the Little Careenage, which, admitting only one ship at a time, is capable of containing thirty ships of the line. The island is divided into Basseterre, the low or leeward country, which is the best cultivated district, and Capisterre, the high country. Both of these districts are considered unhealthy, the first from the abundance of stagnant water, and the other from the denseness of the woods. As cultivation proceeds, however, these causes will be removed, and the island rendered as healthy as any in its neighbourhood. The capital is Castries, which is the only town in the island, and a place of no importance. There is a small island, called Pigeon Island, about six miles from St. Lucia, which is considered a healthy and important military station; and there is excellent anchorage ground between it and St. Lucia.

VIII.—DOMINICA.

This island is situated between the French colonies of Martinique and Guadaloupe, in 15° 25′ north latitude, and 61° 15′ west longitude. It is about twenty-nine miles in length and sixteen in breadth, containing about 186,436 acres. It was considered a neutral island until 1759, when it was taken possession of by the British, with whom, after being repeatedly taken and retaken, the island still remains. Dominica is of volcanic origin, and has many lofty mountains, the highest of which is 5314 feet above the sea's level. Several of these mountains contain active volcanoes, which frequently discharge vast quantities of burning sulphur; and there are many hot water springs throughout the island. The valleys are fertile, well watered with thirty fine rivers and numerous smaller streams. The trees are lofty, affording the finest timber, such as locust-wood, rose-wood, mastic, iron-wood, cinnamon, bastard mahogany, and a gum tree of considerable value. The ferns are of immense size, some of them even reaching the height of twenty-five feet, and of great beauty. Domestic animals are very abundant throughout the island; and, indeed, all European animals succeed extremely well in this place. In the woods are innumerable swarms of bees, which lodge in the trees, produce large quantities of both wax and honey, and are said to be identical with the European bee. The capital is Charlotte-town, situated in the parish of St. George. The streets are spacious, well paved, and from the heights above the town look new and clean. The roadstead is open to the hurricanes which frequently occur from August to October, but otherwise safe. Prince Rupert's Bay is the safest harbour in the island, and is said to be capable of containing the whole British navy. The government is much on the same footing as the other islands; consisting of a lieutenant-governor, council, and assembly. There is a free school on the island for educating about two hundred pupils; and fourteen places of worship. The fortifications are very strong; and the militia are thought little inferior to regular troops.

IX.—MONTSERRAT.

This is one of the smallest of the British West India Islands, being only about twelve miles long, and seven and a half broad. It was discovered by Columbus, first settled by the English, and taken once by the French; but has ever since remained a colony of this country. Montserrat appears to be of volcanic origin, and presents a very uneven and mountainous surface. It is extremely difficult of access from the broken character of the land, and the coral beds and rocks which stud the sea around the southern part of it. The mountains are in many places inaccessible, and seem to have been rent from each other by some strong convulsion, from their being so precipitous. Both mountains and valleys are covered with wood; and many fine streams run to the low lands. The capital is Plymouth, a small but well built town, the houses of which are constructed of stone, and exceedingly comfortable. Indigo was formerly much cultivated in this island, but this article has been abandoned; and the principal productions now are cotton and sugar, the latter of which is much esteemed. This island has been called the Montpelier of the West Indies, from the healthy nature of the climate, although occasionally subject to hurricanes.

X.—ANTIGUA.

This island, which was discovered by Columbus in 1493, is about twenty miles long, fifty-four in circumference, and contains an area of 69,277 acres. It was first settled in 1632 by the English, but its progress was slow at first, in consequence of the want of water. This island is somewhat oval in shape, indented with many bays, and surrounded with small islands, rocks, and shoals, which render it difficult of access. The face of the country in the south-west part is low, and even marshy, but it gradually rises towards the south and west. None of the mountains are of any great elevation, the highest being little more than 1200 feet above the sea's level. The island is almost destitute of water, there being only a few small rivulets running from the hills. The colonists are obliged to have tanks to collect the water which falls during the rainy season; but it does not appear that boring has been ever tried. The land, however, is very fertile, and vegetation in every part most luxuriant. Tobacco was formerly much cultivated, but the sugar-cane has entirely superseded this commodity; and there are several medicinal plants produced on the island, such as the aloe, cassia, &c. Antigua is divided into six parishes and eleven districts. The capital, St. John's, is situated on the north-west, and possesses an excellent harbour. English-town, on the south, is the next town which has a fine harbour, with a royal naval-yard, arsenal, and conveniences for careening ships. The whole coast is indented with bays, which, although difficult of access, afford excellent shelter to shipping. The climate is dry and healthy; and the island is not subjected to either heavy dews or severe hurricanes, like most of the other islands. Antigua is ruled by a governor, who is also commander-in-chief over Montserrat, Barbuda, Anguilla, St. Christopher's, Nevis, the Virgin Islands, and Dominica; with a legislative council, and house of assembly. There are nineteen free schools in the island, which afford instruction to 1216 scholars; and religious instruction is administered with great care by all sects. Antigua was the first island to ameliorate the slave laws, by affording the accused the benefit of trial by jury; and an act of assembly, 13th February, 1834, decreed the emancipation of every slave, without requiring the period of apprenticeship prescribed by parliament.

XI.—ST. CHRISTOPHER'S OR ST. KITT'S.

This island, situated in latitude 17° 18′ and longitude 62° 40′, is seventy-two miles in circumference, and c

tains sixty-eight square miles. It was discovered by Columbus, who is said to have given it his own name; and it was first settled by an Englishman of the name of Warner and fourteen associates. Warner found several Frenchmen already on the island; and these two parties, after making war upon the natives, divided the island between them, one part, called Capisterre, or high country, being assigned to the French, and the other part, called Basseterre, or low country, given to the English. Many bloody battles were fought between these two parties until 1713, when the whole island was ceded to Britain. St. Christopher's is of an irregular oblong shape, divided from north to south by a ridge of mountains; and the whole land of the island is somewhat elevated, sloping gradually from the centre to the sea. The greatest height is Mount Misery, which rises 3711 feet, almost perpendicularly, and is clothed with vegetation nearly to the summit. There is no plain in the island which can be called swampy, the gradual fall of the ground carrying off any superfluous moisture from the earth. The vale of Basseterre is described as extremely beautiful, the ground being very rich, and everywhere highly cultivated. The soil is chiefly of a dark gray loam, lying upon a bed of ashes, very porous, and is considered the finest soil for the cultivation of the sugar-cane in the West Indies. There is said to be a sulphur mine in one of the mountains of the centre, and another of silver; but it does not appear that these have ever been worked. The island is watered by four rivers, none of them of any size; and there are numerous springs in the low lands. These, however, from strong saline impregnations, are not fit for drinking, and the inhabitants have to collect rain water in tanks for domestic purposes. This island is extremely dry and healthy, the rains being more frequent than heavy, and the nature of the land preventing the water from stagnating. The capital is Basseterre, which is the best shipping station. The government consists of a lieutenant-governor, council, and house of assembly; and the colonists have always shown a desire to promote education.

XII.—NEVIS.

This beautiful little island, consisting only of a single mountain, which rises like a cone out of the sea, green, unbroken, and verdant to the summit, was discovered by Columbus at the same time with St. Christopher's, from which it is separated by a channel about two miles broad. It was first taken possession of by a party of English from St. Christopher's; and the population is said to have rapidly increased. The mountain of which Nevis is composed is about four miles in length, and three in breadth; its area being about twenty square miles. The summit has the appearance of a crater. The hill is well cultivated; and at the height where cultivation ceases, evergreen forest-trees grow luxuriantly, the whole island having a cheerful picturesque aspect. It is divided into five parishes, with three good roadsteads. The capital is Charlestown, which is described as a neat well-built town, with several handsome public edifices. The government consists of a council and assembly, subject in certain matters to the government of St. Christopher's.

XIII.—BARBUDA AND ANGUILLA.

These two islands, although far separated, may properly be classed together, from the similarity of their scenery and the occupations of the inhabitants. Barbuda is situated about twenty miles north-east of St. Christopher's, and ten north of Antigua. It is about twenty miles long and twelve broad. The first notice made of Barbuda is in the time of Queen Anne, when it was given in perpetual grant to General Codrington and his descendants, by whom the greater portion of it is still possessed. Anguilla, or Snake Island, is about 100 miles north of Barbuda, and the same distance north-north-west of St. Christopher's, situated in latitude 18° north, and longitude 64° west. It is thirty miles long and three broad, and receives its name (signifying an *eel*) from the peculiarly winding shape it presents. These islands were both first settled by the British; and, although subject to occasional attacks from other powers, they have always remained in the possession of this country.

The interior aspect of these two islands is quite different from that of any of our other West Indian settlements, being in many respects, indeed, quite *English*. The sole occupation of the inhabitants is farming, rearing stock, and cultivating provisions, for which a ready market is found in the neighbouring islands. There are no groups of masts in the bays and harbours; and instead of the laborious bustle, smoke, and noise, incidental to the sugar and coffee plantations, there are to be seen only numerous little rural dwellings, surrounded by waving crops of grain, and verdant fields covered with sheep and cattle.

XIV.—VIRGIN ISLANDS.

This name was given by the discoverer Columbus (in 1493) to a group of about forty small islands, lying to the northward of the Leeward Carribean Islands, and between them and Puerto (or Porto) Rico. They extend about twenty-four leagues from east to west, and about sixteen from north to south. They are divided between the British, Danes, and Spaniards, but much the larger and more valuable number belong to the former. The names of these are Tortola, Virgin Gorda (or Peniston, and sometimes corrupted into *Spanish Town*,) Josvan Dykes, Guana Isle, Beef and Thatch Islands, Anegada, Nichar, Prickly Pear, Camanas, Ginger, Cooper's, Salt Island, St. Peter's Island, and several others of little or no value. Those belonging to the Danes and Spaniards will be noticed in their proper places.

The British Virgin Islands were first possessed by a party of Dutch buccaneers, who built a fort on Tortola, but they were expelled soon after by a party of English. They have remained in the possession of this country ever since. The largest of these islands is Anegada, the next Tortola; and although never considered of any great importance, they afforded excellent shelter to shipping during the late war. Tortola is mountainous, the interior containing large tracts of waste land difficult of access. The soil is thin, and not well suited to the cultivation of the sugar-cane, although this and cotton are the chief articles of produce. The harbour of Tortola is very extensive, completely land-locked, and has afforded shelter, in many cases during the war, to 400 vessels. Anegada, although the largest island in extent, is of little importance, only a very small portion of it being under cultivation. It is surrounded by a reef which renders it difficult of access, and the other islands being so near, it is little frequented. Virgin Gorda is of an irregular shape, and contains two good bays, where ships may ride in perfect security. The soil is of a light sandy nature, and the chief articles of produce are sugar, indigo, tobacco, and cotton. These islands were formerly ruled by a deputy-governor and council, who exercised both the legislative and executive authority, but they are now subject to the government of St. Christopher's, with a council and assembly of their own.

XV.—THE BAHAMAS OR LUCAYOS ISLANDS.

These are the most northerly of all the West Indian islands, stretching towards the coast of Florida, and forming with it the channel called the Strait of Florida. They were the first land discovered by Columbus in 1492, and amount in number to fully five hundred. The island which gives the name to the whole is the most northern, as well as the most important of the group.

settlement was established by the British in 1629, which was ravaged by the French and Spaniards several times, and the group of islands became a nest for pirates, until the beginning of the last century, when they were expelled by the British. The Bahamas are evidently of coral formation, and although flat, they have a very pleasing aspect, from the richness of the vegetation. The chief island is New Providence, which contains the capital Nassau. These islands are very healthy, and from their situation the climate is delightful, being of a medium temperature. The chief article produced for exportation is cotton, neither sugar nor coffee having succeeded. Provisions of all sorts are very plentiful, cattle and sheep thrive well, and the shores abound with fish and turtle. The government consists of a governor, council, and house of assembly.

XVI.—BERMUDAS, OR SOMER ISLANDS.

These are a small cluster of islands, lying almost in the shape of a shepherd's crook, in latitude 32° 20′, and longitude 64° 50′, distant about six hundred miles from the nearest point of the American continent. Their discovery was owing to the shipwreck of Juan de Bermudez, a Spaniard, who was driven ashore upon these islands while on a voyage from Spain to Cuba. The same fate happened to Sir George Somers, an Englishman, in 1609, who was the first to colonize the Bermudas. They are upwards of three hundred in number, contain about fourteen thousand acres of land, and are so much alike in character, that to describe one is to describe the whole. The principal islands are St. George, Ireland, St. David, Somerset, Long and Birds' Islands, &c. These lie close together, in such a way as to form capacious bays, which afford good anchorage when once got into. The coast, however, is of the most dangerous description, being thickly studded with rocks, which are visible at low water, and disappear at flood tide. The chief articles of produce consist of arrow-root, coffee, cotton, and indigo. The cedar-tree grows to a great height, and is used for ship-building, and the palmetto is much cultivated for making straw hats. The soil is very fertile, and produces many kinds of vegetables fit for food; and medicinal plants, such as the aloe, jalap, &c., grow spontaneously. The whale is an annual visiter to the coast, the catching of which forms a lucrative employment to the inhabitants. Bermudas possesses no fresh-water streams, and only a few wells, the water of which is brackish; but there are a great many tanks which fill during the rainy season, and supply the inhabitants. The climate is not considered healthy, the yellow fever being of frequent occurrence. Hurricanes visit the islands annually, the inhabitants being able to tell their approach by a halo round the moon. The Bermudas have never been considered of great importance to this country; but they are likely to become more so in consequence of their being formed into a penal settlement.

BRITISH GUIANA.

The British South American settlements, now forming the colony of Guiana, although not properly belonging to the West Indies, naturally come to be noticed here. This colony, as claimed by Britain, extends from the river Coventyn, in 56° 58′, to Punta Barima, at the southern outlet of the Orinoco, in 60° 6′ west longitude, in breadth, and from the Acaria mountains to the sea, in length. It formerly consisted of the settlements of Demerara, Essequibo, and Berbice, but these are now united under one government, and include 76,000 square miles. The whole coast is flat, and on approaching from the sea, nothing is visible but the tops of the trees, which seem to be growing out of the water. This alluvial flat extends from ten to forty miles inland, and is terminated by a range of sand-hills, which approach within two miles of the sea, on the south side of the Essequibo. Parallel with these sand-hills run several detached groups of hillocks, of moderate elevation. Farther into the interior, the country is much diversified with mountains and valleys. The greatest height of the mountains is supposed to be 7500 feet above the level of the sea, and there are other ranges which reach 3500 and 4000 feet. Immense savannahs, or plains, occupying 14,400 square miles, extend between the rivers Demerara and Coventyn, approaching the sea at the river Berbice. These plains appear to have been an inland lake, and are sandy, growing only a few stunted trees; but they are very rich in pasturage. Guiana has three great rivers, the Essequibo, the Berbice, and the Demerara. The Essequibo, the largest of these rivers, is about 620 miles in length, but, from the number of rapids, it is only navigable for fifty miles from its mouth. During its course, it receives the waters of several large tributaries, which irrigate an immense tract of country. To the eastward, and running parallel to the Essequibo, is the Demerara, which is navigable for vessels of small size about eighty-five miles above Georgetown. This river receives no tributaries of any magnitude, and its navigation is much obstructed by a bar running across its mouth, which has only nine feet water over it at half flood. It deepens, however, towards the eastern shore, and the channel here has nineteen feet at high water. The Berbice, although smaller than the Essequibo, is of more importance, from its course being free for vessels drawing twelve feet water about one hundred and five miles, and for vessels of seven feet draught, one hundred and sixty-five miles into the interior of the country. The river Coventyn forms the boundary between the British and Dutch possessions, and is navigable one hundred and fifty miles for vessels drawing seven feet of water. There are also several smaller streams in the intervals between these great rivers, which, although of no importance for navigation, are extremely useful in the irrigation of the country. These rivers periodically inundate their banks, which renders the soil extremely fertile. This fertility is kept up during the dry season by heavy falls of dew, and this takes place not only on the banks of the rivers, but also in the open plains. The soil is very fertile, in some parts sandy, but growing abundance of grass, and in others it is a strong retentive loam, well adapted for the cultivation of coffee, sugar, rice, &c. The coast is covered with mangrove and curina bushes, and towards the interior, thick forests occur, which yield many valuable kinds of timber. The principal trees are the mora, which grows one hundred and twenty feet high, the green heart, the purple heart, the kakaralli, and many others, admirably adapted for the construction of ships. Besides these may be mentioned the iron-wood, the locust-tree, the letter-wood, and the lame, which, from the closeness of their grain, their beauty, and durability, are much in request for the manufacture of articles of furniture. Many valuable medicinal plants are also indigenous to Guiana, besides fruits, such as the pine-apple, the guava, the marmalade fruit; and the woods afford dyes of various kinds. The animal kingdom is very varied, and contains, besides the American tiger, lion, alligator, and different kinds of serpents, many animals which afford wholesome and delicate food for man. Among these may be mentioned the tapir, the water-haas, the wild hog, the Mexican hog, and various species of deer. Numerous herds of monkeys people the forests, which are used as food by the natives, and the sea-cow is sometimes found in the rivers, the flesh of which is said to resemble veal. The feathered tribes are very rich in plumage, comprehending parrots, macaws, humming-birds, mocking-birds, &c., besides wild-ducks, wild-pigeons, the duragua, and the maam, which afford delicate and nutritious food. Land tortoises, and fresh-water turtles, are very abundant, the

latter being chiefly found in the Essequibo and its tributaries. The rivers are well stored with fish, some of which are very large, and said to be as delicate as any European fresh-water fishes. The wild animals seldom attack man unless provoked, but they prove sometimes very destructive to the flocks of the settlers. The serpents are all described as sluggish and loath to bite, unless irritated; they satisfy themselves with attacking deer and smaller animals. The inhabitants of Guiana are constantly annoyed by the insects, which are very numerous, and their bite is painful, although not dangerous. The worst of these are the centipede, the scorpion, the bush spider, the chigo, the mosquito; and some species of ants prove very destructive to vegetation.

British Guiana is divided into three counties, Demerara, Essequibo, and Berbice. The two former have been united, and are divided into eleven parishes, and the latter into six. These colonies were first settled by the Dutch, captured by the British in 1796, given up to the Batavian Republic in 1802, retaken in 1803, and finally ceded to Great Britain at the general peace of 1814. The settlements are all situated upon the banks of the rivers from which they receive their name, extending along both sides, and generally as far inland as the rivers are navigable. Each plantation has a wharf or landing-place of its own, and canals are cut into the land for the admission of boats and the draining of the surrounding country. For fifty miles along the seacoast of the county of Berbice, a huge embankment has been raised against the sea, on which is a carriage-road sixty feet broad. A comparatively small portion of Guiana is yet cultivated, and an immense field for colonial industry still lies open. The extent of cultivated land, however, is gradually increasing as the advantages of the colony are becoming known. The staple products consist of sugar, rum, coffee, and cotton; and it is thought, from the fertility of the soil, and the constant summer which prevails, that many other valuable plants might be cultivated. The climate is very genial and regular throughout the year, the maximum heat being 90, the minimum 74, and the mean temperature about 82 degrees. Two wet and two dry seasons constitute the changes of the year; the great wet season, as it is called, commencing in the middle, and continuing till the end of August, and the great dry season from the end of August till the end of November. The short wet season occurs from December to the middle of February, and the short dry season from February to April. The foregoing applies to the coast regions, the interior being marked by only two great changes during the year. Hurricanes never occur in this colony, and even severe gales are little known. Earthquakes are occasionally felt, but they are very slight, and little attention is paid to them by the inhabitants.

The capital of British Guiana is Georgetown, situated on the western bank of the river Demerara, which has a population of from twenty to twenty-five thousand. The streets are generally wide, traversed by canals; the houses built of wood, two stories high, and separated from each other by gardens and ditches. It is built in two rows, about a mile long, on the river side, and contains several handsome buildings. New Amsterdam, the chief town in the county of Berbice, extends about a mile and a half along the western bank of the river Berbice. The houses have all gardens behind, and are separated from each other by canals or trenches, and the town is described as presenting a very pleasing aspect on entering the river. The population of this town, according to the last published census, was 2900, and there are many other villages which are gradually rising in importance.

The exports from Guiana, as is the case with all the other West India colonies, have decreased of late years, but from the encouragement which is now given to emigrants, it is hoped that this will in the course of time be remedied. The exports from the whole of Guiana in 1839 amounted to 35,845 hogsheads, 2135 tierces, 2396 barrels of sugar; 13,245 puncheons, 3817 hogsheads, 882 barrels of rum; 11,664 casks, 85 hogsheads, 14 barrels of molasses; 1,350,700 lbs. of coffee; 912 bales of cotton. The value of the imports in 1836 was £1,204,560, and since that period it is thought to have increased to nearly £1,500,000.*

The population of Guiana may be divided into Europeans, Africans, people of colour from other parts, and native Americans. The native Americans have dwindled down to a very small number, who lead a wandering life on the frontiers and savannahs of the colony.

The government is vested in a governor and court of policy, consisting of the governor, chief-justice, attorney-general, collector of customs, government secretary, and an equal number of persons elected from among the colonists. Formerly all free male inhabitants were liable to serve in a military capacity, but since the abolition of slavery the militia has been disbanded. The local government have made the greatest efforts to promote education in the colony, and many schools and churches have been erected, at considerable expense. The number of individuals who received instruction in 1839 amounted to 4683 adults, and 6680 children; making together 11,363.

GOVERNMENT OF THE BRITISH WEST INDIES.

The forms of government established in the British colonies in the West Indies, may be divided into two classes; those having a governor, council, and representative assembly; and those having only a governor and legislative council. The first includes Jamaica, Barbadoes, Antigua, Tobago, Grenada, St. Vincent, Montserrat, Nevis, St. Christopher's, Honduras, the Virgin Islands, the Bahamas, and the Bermudas; and the second, Guiana, Trinidad, and St. Lucia. The reason for this difference is, that most of the colonies were acquired by conquest, and the inhabitants who chose to remain in the island were guarantied their laws and the exercise of their religion. The governor has the chief civil and military authority; the council is somewhat analogous to the privy-council in this country, and the House of Assembly to the House of Commons. A member of the House of Assembly in Jamaica must possess a freehold of £300 per annum, or a personal estate of £3000; and an elector must have a freehold of £10 per annum in the parish for which he votes. Some of the islands have only lieutenant-governors, who are under the governor of some adjacent island. The lieutenant-governors of St. Vincent, Grenada, Tobago and Guiana, are under the governor of Barbadoes. Their powers, however, are nearly equal to those of a governor. In those islands which have no representative assembly, the legislative council consists of the chief secretary, the treasurer, the chief-justice, the attorney-general, and the commander of the troops. These are appointed by the crown; and sometimes a few of the principal landed proprietors are made members of the council. Several islands are sometimes included in one government, who send their representatives to the island which is the seat of legislature for the time being. Thus, in the Leeward Islands, St. Christopher's, Nevis, Montserrat, and one or two other small islands, send their representatives to Antigua, which is the seat of government for them all; or, in other words, the residence of the governor. The superior and inferior courts of judicature resemble those in England, the laws being the same, unless as they may be affected by the special colonial enactments passed from time to time. Assize courts are frequently held, to expedite

* Schomburgk's Guiana.

the course of justice. There are, likewise, parish courts, wherein justices of the peace decide summarily in small debt cases. There are offices where all deeds, wills, sales, and patents, are recorded. All persons intending to leave the island are obliged to give notice at the office of enrolment three weeks before they can be entitled to a pass, or to find security for what debts they may leave unpaid in the island; and, for further precaution, masters of vessels are taken bound, under heavy penalties, not to carry off any person without such pass. The procedure of the assembly follows as near as may be the formula of the British legislature, and all their bills have the force of laws as soon as the governor's assent is obtained. The power of rejection, however, is vested in the crown, but, *until rejected*, the laws are valid. The governor can also refuse his assent to all such laws, and can dissolve and call together the assembly at pleasure. His salary is paid partly by the crown, and partly from the island revenues.

FOREIGN POSSESSIONS.

FRENCH.

The French possessions in the West Indies comprise the islands of Martinique, Guadaloupe, Marie Galante, and Deseada. Martinique is situated at the entrance to the Gulf of Mexico, between the parallels of 14° 23′ and 14° 52′ north, and 63° 6′ and 63° 61′ west from Paris. It is about fifty miles long and twenty broad, and a hundred and forty miles in circumference. It is of volcanic origin; romantic in appearance; and the mountains are covered with almost impenetrable woods. Martinique is well watered, seventy fine rivers being enumerated; and there are many other streams in the island. The soil is good, although it varies much on account of the volcanic eruptions, which have in some places covered the surface of the land. About two-fifths of the whole island are cultivated; the rest being occupied with mountains, forests, and plains, which latter yield good herbage for cattle. Port Royal, the capital, is situated on one of the several bays which indent the coast, and possesses the safest and most capacious harbour in the West Indies. The town is well built, the streets regular, and running at right-angles to each other, with a stream of water on either side. The population is about 7000. The chief commercial town is St. Pierre, which is described as exceedingly neat. The houses are high, having a European aspect, and the streets regular and clean: population 30,000. The population of the whole island is estimated at 101,865 inhabitants, of whom, in 1827, 9937 were whites, 10,786 free people of colour, and 81,142 slaves.

Guadaloupe is situated in latitude 16° 20′ north, and longitude 62° west. It is divided through the centre by a small channel, which is navigable for vessels of fifty tons, and forms as it were two islands. The eastern division, called Grandeterre, is fourteen leagues long and six broad; and the western Basseterre, is fifteen leagues long and fourteen broad. There are several volcanic mountains in Guadaloupe, one of which still emits smoke, and sometimes sparks of fire. The island is well watered, and diversified with hills and valleys. The soil is good, and yields abundance of fruits and grain. The chief productions are sugar, which, although the cane reaches a great height, is not good; and coffee, which is also of an inferior description. The capital is Pointe à Pitre, which possesses a spacious port; and here the principal trade is carried on. Basseterre is also a considerable town, with many fine buildings, fountains, and public gardens.

Deseada and Marie Galante are small islands, situated near Guadaloupe, and subject to its government. The former is famous for its cotton, and the latter yields sugar and coffee. These islands, along with Guadaloupe, contain 334,142 English acres, with a population of 112,111 inhabitants.

SPANISH.

A few years ago, the colonial possessions of Spain extended from the frontiers of the United States almost to Cape Horn. Now, she has not a foot of land on the whole American continent; and of the islands, is possessed of only two worth mentioning—Cuba and Porto Rico, the situation of which has been before mentioned.

Cuba is by far the largest island in the West Indies, being seven hundred miles in length, and a hundred and seventeen at its greatest breadth. It is traversed throughout its length by chains of mountains, some of which reach the height of 8000 feet above the level of the sea. From these mountains flow numerous streams which water the soil, and render it highly productive of all tropical vegetables. The savannahs, or plains, are very extensive, stretching on both sides from the mountains to the sea. The soil of these plains is so fertile, that two, and even three, crops of grain have been cut annually; and, during the whole year, the fields are covered with plants in blossom. There are several salt lakes in the interior, which afford abundance of fish, and mineral springs, which have proved useful in the cure of cutaneous diseases. The island is very rich in minerals, particularly copper, iron, and lodestone; and mines of gold and silver have also been worked. Coal mines have likewise been opened, but it does not appear that they have been worked to any extent. Marbles of various kinds have been met with; but, from the rugged nature of the mountains, and the thickness of the forests with which they are covered, the geological structure of Cuba has not been well ascertained.

The indigenous animals of this island are numerous; the principal being the alligator, the sea-cow, the iguana, a species of lizard, the turtle, &c. The breeding of mules has recently been carried to a great extent, large numbers having been brought from the mother country for this purpose. The mahogany-tree, the cedar, lignum-vitæ, ebony, the well-known *palma real*, and several other kinds of wood, are abundant. Among the fruits cultivated may be mentioned the chestnut, pine-apple, custard-apple, plantain, orange, and melons. Maize, rice, beans and peas, are cultivated in considerable quantities in the agricultural districts; but the rearing of wheat, which was formerly largely grown, is now abandoned. This fine island was for a long time little cultivated by the Spaniards, being looked upon more as an intermediate station between the mother country and her American possessions, than as a valuable colony. Its position, commanding the entrance to the Gulf of Mexico, gives it great commercial importance; and since the ports were opened to foreigners, the productions and trade of the island have greatly increased. The chief exports of Cuba are sugar, coffee, and tobacco, which, manufactured into cigars, is in high estimation.

The capital is Havana, situated on the north side of the island, and which is the finest city in the West Indies. It possesses a splendid harbour, which, although narrow at the entrance, is without bar, and, inside, is capable of containing a thousand ships. There are several handsome churches in the town, which give it an imposing appearance; but the streets are narrow and ill kept.

The other towns in Cuba are Trinidad, on the south, Mantanzas on the north, Santiago de Cuba on the eastern extremity, and Villa del Principe in the heart of the island. The exports of sugar from Cuba in 1832, amounted to 250,000,000 lbs.; coffee, 50,037 lbs.; the amount of tobacco has not been well ascertained. The population, in 1827, amounted to 704,487, of whom

317,064 were white, 57,514 mulattoes, 48,980 free negroes, 286,942 slaves.

Porto Rico, the only other island belonging to Spain, is situated about twenty-five leagues to the eastward of St Domingo. It is about ninety miles long, thirty-three in average breadth, and contains 2970 square miles. It is intersected by a chain of lofty mountains, which run through it lengthwise, and possesses table-lands and valleys of great fertility. The island is well watered by rivers, some of which are navigable for two or three leagues from their mouths; and they all abound in excellent fish. The soil on the east and north is rich in pasturage, and numbers of horned cattle are reared by the inhabitants. That on the south side is well adapted for the raising of sugar; but the climate is often very dry, and the land parched. The climate of this island is somewhat peculiar; on the north coast it often rains during the whole year, while on the south coast, an entire want of rain for twelve or fourteen months is no uncommon phenomenon. The chief productions of Porto Rico are sugar, coffee, indigo, rice, and live-stock. The value of the exports in 1830 was calculated at 3,411,845 dollars, and that of the imports at 2,208,941 dollars; the dollar being equal to about four shillings and threepence sterling. The number of inhabitants in 1830 was estimated at 323,838, of whom 162,311 were whites. The chief towns are Mayagues and Aguadilla.

DUTCH.

The Dutch possessions in the West Indies are Curaçoa and St. Eustatius, Saba, and part of St. Martin—all in the Carribean group. The two former are naturally barren. Curaçoa, from its proximity to South America, was formerly a place of great contraband traffic; but, since the independence of that continent, it has ceased in a great measure to be an *entrepôt*. It is thirty miles long and eleven broad, and produces sugar and tobacco. Like some of its sister isles, it is entirely dependent on the rains for a supply of water. It was held by the Spaniards until the year 1632, when it was taken by the Dutch, in whose hands it has since remained. The population is estimated at about thirty thousand.

St. Eustatius consists of a single mountain, which is twenty-nine miles in circumference, and cultivated to the very summit. The productions are sugar and tobacco, and the population may be about fifteen thousand. It was first colonized by the Dutch in 1635, and continued for many years a subject of contention between them and the French, by whom it was alternately possessed, until 1781, when it was captured by Admiral Rodney. The booty which fell into the hands of the English on this occasion was estimated at £4,000,000 sterling. It was restored to the Dutch by the peace of 1795; and, after being again captured by the English, was finally secured to the Dutch by the peace of 1814.

Saba and St. Martin are too inconsiderable to need further mention.

DANISH.

The Danish settlements, all belonging to the Carribean group, are three in number—St. Croix (or Santa Cruz), St. Thomas, and St. John, of which the former alone is of any importance. It is about eighty-one miles square, and contains about thirty thousand inhabitants. The soil is fertile and well cultivated, producing sugar, rum, and tobacco. St. Thomas is about six leagues in circumference, and St. John about the same. They are both quite inconsiderable.

SWEDISH.

The only colony belonging to the Swedes is the small island of St. Bartholomew, in the leeward Carribean group, and about fifteen miles in circumference. It has only one town and one harbour—Gustavia, and Le Carenage. The population is about six thousand.

INDEPENDENT ISLAND.—ST. DOMINGO.

This island, lying between Porto Rico on the east and Jamaica and Cuba on the west, is three hundred and ninety miles long, and from sixty to one hundred and fifty miles broad. It was discovered by Columbus, who called it Hispaniola, or Little Spain, but the native inhabitants call it Hayti, or the mountainous land. The French and Spaniards took possession of the island in 1650, dividing it between them. No particular event took place till the period of the French Revolution, when, taking advantage of the contest between the royalists and republicans, the natives and slaves rose in a body, massacred the whites, and established their independence. Christophe, formerly a slave, was elected chief, and governed the island with great wisdom for a number of years. In 1811, he was crowned king, created princes and nobles, and reigned undisputed till 1820, when his jealousy and despotism caused a general revolt, and, seeing his affairs desperate, he shot himself. A republic was then established, which was soon extended over the whole island, the Spanish half having also made a successful revolt. The government at present consists of a president, who is elected for life, and a senate and chamber of representatives.

The greater part of the coast of St. Domingo is rocky and dangerous; but the bays of Samana and Neyba afford secure anchorage for large ships. There are also many small ports, situated generally at the mouths of rivers, in which small vessels can anchor with safety. The rivers are numerous, the principal being the Haina, the Nigua, the Neyba, and the Yima, which are navigable for some leagues from their entrance. In this island a salt-water lake exists, which is about eighteen leagues in circumference, and contains fish similar to those found in the sea, such as the shark, the seal, the porpoise, &c. The country is mountainous, but interspersed with fine plains of great fertility. The mountains intersect the island from east to west, some of them reaching the height of 6000 feet above the level of the sea. On the north-west side is an extensive plain, supposed to be eighty leagues long, and from ten to fifteen broad, which is extremely fertile, being watered by numerous streams. The soil is of the finest description, and is distinguished by the variety of its vegetable productions. The mahogany-tree grows to a great height, and the manchineel affords a species of wood veined like marble, and which is susceptible of the highest polish. Several species of dye-woods are found in the island, and also the lignum-vitæ, iron-wood, a species of oak of great size, and abundance of pine. The cotton-tree is the largest in the island, and is formed by the natives into canoes, which are light and capacious. The fruits are very numerous, and are described as extremely fine; and flowers of endless variety adorn the woods. The indigenous quadrupeds were only four in number, and they are now all extinct. The French and Spaniards, however, introduced breeds of horned cattle, hogs, sheep, horses, mules, and asses, which have multiplied exceedingly, and are of great value to the inhabitants. Wild-fowl are abundant; and turtle, and numerous varieties of fish are caught on the coast and in the rivers. Mines of gold, silver, iron, and copper, were formerly found in this island, but it does not appear that they are worked to any extent at present. The island is divided into six districts, named generally from their positions, West, South, Antihonite, North, North-east, and South-east.

St. Domingo was formerly considered one of the most important islands in the West Indies, and it is evident from its size, and the fertility of the soil, that it might be made so again. The policy of the government, since

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the independence of the island was declared, has been illiberal; heavy burdens are imposed upon merchants settling in the country, and all foreign merchandise is liable to a duty of 12 per cent. upon entering the country, except French, which pays 6 per cent. Sugar and coffee were formerly exported in very large quantities, but these have now very much decreased. In 1789, the amount of raw sugar exported was 93,500,000 French pounds, and in 1801 this had fallen off to 18,500,000. The export of coffee in 1789 was 76,835,219 pounds, and in 1801 this had decreased to 43,420,270 pounds. The exportation of wood has increased as that of sugar and coffee have declined, and tobacco is also more extensively cultivated. The population of the island has diminished considerably since the revolution. According to some accounts, it is estimated at 422,939, but others give it so high as 900,000. Port-au-Prince, the capital, is situated in the department of the West, has an excellent roadstead, and is the chief seat of trade. The town is built of wood; the streets are unpaved, and, from the marshy nature of the surrounding country, it is very unhealthy in summer. The population is about 15,000. The other towns are Port Haytien, which is the best built place in the island; Les Cayes, and St. Domingo, the capital of what was formerly the Spanish part of the island.

CLIMATE OF THE WEST INDIES.

The year may be divided into four seasons:—The first commencing with the mild vernal rains in April or May, which usually last six weeks; the second includes June, July, August—hot and dry; the third includes September, October, and November, which are the hurricane and rainy months; and the fourth, December, January, February, and March, which are the most serene and cool months.

The climate of the West Indies is pretty nearly alike in all the islands. The average of the thermometer in the towns may be set down at 80 degrees during the summer months (from July to November). It often attains to above 90, but in the mountains it has been known to be so low as 44 degrees, so that a fire at noon is there necessary a great part of the year. The temperature is kept cool by the alternations of the sea and land breezes, the former blowing only during the day, the latter only during the night. Of the latter, which always blows from the centre of the island (be it ever so small), the only scientific account ever given is that of Dr. Franklin, which is as followa:—"As soon as the sea-breeze dies away (in the afternoon), the air of the plains, being rarefied, ascends towards the tops of the mountains, and is there condensed by the cold, which, making it specifically heavier than it was before, it descends back to the plains on both sides of the ridge." It is a singular dispensation of Providence, that in Barbadoes and the smaller windward Carribean islands, which are without these landward breezes, the sea-breeze (or trade-wind) blows both night and day.

The most delightful time of day in Jamaica is at daybreak, before the sun has yet begun to pour his effulgence over the hemisphere of the Carribees, and before the land-breeze has died away. The sea-breeze, or "doctor," as it is gratefully designated by the inhabitants of Jamaica, which invariably blows from the south-east, or some other point ranging from south to east, generally sets in about nine o'clock, A. M., at first only gently rippling the surface of the ocean, and increasing gradually, until it often assumes the strength of a temporary hurricane. Its coming is hailed by the panting, and literally melting inhabitants, with a degree of thankfulness and a sensation of relief, which can only be known by those whose lot it has been to inhale the oppressive and suffocating atmosphere of these climes.

Were it not for this regular alternation of trade-winds and inland-breezes, the islands of these seas would, to Europeans at least, be perfectly uninhabitable. Let such of our readers, therefore, whose destiny has never led them beyond the cool shores of Britain, conceive, if they can, the sufferings of their brethren in the tropics, when it happens that the "doctor" absents himself for a whole fortnight at a time.

In the afternoon, the sea-breeze dies away, as it comes—gradually; after which, for a few hours, earth and sea are again locked in a stillness of repose—a syncope of motion, which, to a new comer, has something almost ominous; and as his imagination is generally saturated before his arrival with descriptions of those fearful visitations, the earthquakes—which are there so frequent, though seldom occasioning much damage—he instinctively listens, in that period of profound stillness, for the first rumbling growl preceding the volcanic explosion. Earthquakes, however, have for many years been becoming rarer and rarer in the West Indies—a fact which seems to confirm the hypothesis that these islands having, at one time or other, had their origin in volcanic eruptions, are gradually cooling, and that these fearful visitations will soon altogether cease. There is scarcely a house, however, of many years' standing, in the walls of which several huge cracks are not to be seen.

The most dreadful scourge of these islands is the hurricanes, which have devastated them all repeatedly from time to time. Between the years 1780–87, a succession of hurricanes desolated Jamaica to such an extent, that, combined with the scarcity of provisions produced by the American war, no less than 15,000 negroes perished from famine. The more mountainous islands also suffer severely from the violent rains, which pour down, as it were, in solid masses, sometimes sweeping the entire soil, and all growing thereon, from whole plantations, and leaving nothing but the bare rock! Since the gradual clearing of the islands from wood, thunder is much less frequent now than formerly, and seldom does any damage. It is, however, terrifically loud.

The following table will show the number of deaths between the years 1820 and 1832, among the labouring population when still slaves, and give an idea of the comparative health of the islands:—

Trinidad,	1 in 23
Tobago,	1 " 24
Demerara and Essequibo,	1 " 33
Berbice,	1 " 32
Jamaica,	1 " 40
Grenada,	1 " 30
St. Vincent,	1 " 32
Barbadoes,	1 " 38
St. Lucia,	1 " 34
Dominica,	1 " 32
Antigua,	1 " 36
St. Christopher's,	1 " 36
Montserrat,	1 " 34
Nevis,	1 " 41*

PRODUCTIONS.

The natural productions of all the West India islands are nearly alike. The sugar-cane is the principal production of the West Indies, and is the commodity which has always given the colonies their commercial importance. There are four varieties of the sugar-cane, two of which, the Bourbon and the transparent cane, are those chiefly cultivated. The next plant is the coffee, which was introduced in 1728, and is extensively grown in almost every island. Cotton, indigo, cocoa, and various kinds of spices, are also more or less cultivated. Of late years, many proprietors have been in the habit

* Schomburgk's Guiana.

of planting cocoa-trees on their estates, which it is thought have been too much neglected. Almost every kind of fruits produced in tropical climates grow in one or other of these islands: the vine, the pomegranate, the pine-apple, the water-melon, tamarinds, oranges, the star-apple, the bread-fruit tree (introduced by Captain Bligh in 1793), and numerous others. The pimento of commerce is also produced in these islands; the avocado pear, the papaw tree, and the banana or plantain, of which Humboldt says that it is doubted whether there is another plant in the world which, on so small a space of ground, produces such a mass of nourishing substance. The best description of the vegetation of the West Indies is that given by the Rev. Lansdowne Guilding in his account of St. Vincent, from which we quote the following:—"The ground is overloaded with plants, which have scarcely room for their development. The trunks of the older trees are everywhere covered with a thick drapery of ferns, mosses, and orchideous plants, which diffuse into the air the richest odours, and almost conceal from sight the noble stems that uphold them. Their growth is favoured by the great moisture of the air; and these lovely parasites, sheltered from the direct rays of the sun, are seen ascending on every side, even the larger branches. So great is the variety of vegetable beauties that sometimes decorate a single trunk, that a considerable space in a European garden would be required to contain them. Several rivulets of the purest water urge their meandering course through the brush-wood; various plants of humbler growth, and which love humidity, display their beautiful verdure on their edges, and are sheltered by the wide-spreading branches of the mango, mahogany, teak, mimosa, and other woods remarkable for their stateliness, and clothed in wild and magnificent pomp. The vegetation every-where displays that vigorous aspect and brightness of colour so characteristic of the tropics. Here and there, as if for contrast, huge masses of trap, blackened by the action of the atmosphere, and decayed tremellæ, present themselves: those blocks, which in colder climates would be doomed to eternal barrenness, or at most would only nourish the pale and sickly lichen, here give support to creeping plants of every form and colour, which cover with yellow, green, and crimson, the sides of the sable rock. In their crevices the succulent species are daily renewed, and prepare a soil for larger tenants; from their summits, the old man's beard, and similar weeds, which seem to draw their nourishment from the air, hang pendant, floating at the pleasure of the winds. At a distance is seen the trumpet-tree, whose leaves seem made of silver plates, as the blast reverses them in the beams of the mid-day sun. In a solitary spot rises a wild fig-tree, one of the gigantic productions of the torrid zone. The huge limbs of this tree, covered with perpetual verdure, throw down, often from the height of eighty or ninety feet, a colony of suckers of every possible size, from that of pack-thread to the vast cable of a ship, without any visible increase in their diameter, and without a joint; these, reaching the ground, become other trees, still remaining united. At other times, the suckers, blown about by the winds, are entangled round the trunk, or some neighbouring rock, which they surround with a network of the firmest texture, as if the hand of man had been employed. Above the rocky summit of the hills, the tree ferns, which are the principal ornament of our scenery, appear at intervals: convolvuli, and other creeping plants, have climbed their high stems, and suspended their painted garlands. The fruits of our country, scattered within our reach, and the green leaves of the bananas and heliconias, planted beneath, serve to minister to our refreshment, and to convey water from the neighbouring spring. On every side, innumerable palms of various genera, the cocoa-nut, date, cabbage palm, &c., whose leaves curl like plumes, shoot up majestically their bare and even columns above the wood." Although the foregoing description was written for St. Vincent alone, the vegetation of these islands is so much alike, that what is said of one will apply equally to the rest.

Potatoes are cultivated, but they are watery, and never attain a large size. The yam grown in the mountains, however, is much esteemed; and the sea-ports are well supplied with potatoes from Britain and America. There are green peas at all seasons, and a plant called callaloo, resembling spinach, is much used in the interior. The plantain, and what is called the garden marrow, are also abundant, and much in request as food. The flowers indigenous to these islands are numerous, and exceedingly rich in colour; and it frequently happens that fruits and blossoms are seen growing from the same branch.

Regarding the cultivation of those plants which give the West Indies their vast importance, we quote the following from Loudon's Encyclopædia of Agriculture: "The culture of the sugar-cane in Jamaica in some respects resembles that of the hop in this country. The ground being cleared, and worked a foot or more in depth, the sets or cuttings of the cane, which are the tops of the shoots cut off about a foot long, are planted in rows, generally five feet distant, and from two to five feet apart in the row, according to the quality of the soil, more plants being allowed for poor than rich soil. The ground is kept free from weeds, frequently stirred, and some earth drawn up to the plants. From each hill, a number of shoots are produced: in six months or more, these will generally be from seven to ten feet high; the skin smooth, dry, and brittle, heavy with a gray or brown pith and sweet glutinous juice. In this state, the canes are cut, tied in bundles or sheaves, and taken to the mill to be divested of their leaves and decayed parts, and then passed through rollers to express their juice, &c. Cane plantations are formed either in May or June, or in December and January, these being the rainy seasons.

The cotton plant is propagated by seed, which is sown in rows, about five feet asunder, at the end of September or beginning of October; at first but slightly covered, but after it is grown up, the root is well moulded. The seed is subject to decay when it is set too deep, especially in wet weather. The ground is hoed frequently, and kept very clean about the young plants, until they rise to a moderate height; otherwise they are apt to be destroyed by caterpillars. It grows from four to six feet high, and produces two crops annually; the first in eight months from the time of sowing the seed, the second within four months after the first; and the produce of each plant is reckoned about one pound weight. When a great part of the pod is expanded the wool is picked and afterwards cleared from the seeds by a machine called a gin, composed of two or three smooth wooden rollers of about one inch in diameter, ranged horizontally, close and parallel to each other, in a frame; each extremity they are toothed or channelled longitudinally, corresponding one with another, and the centre roller being moved with a foot-lathe, makes the two others revolve in contrary directions. The cotton laid upon these rollers whilst they are in motion, readily passing between them, drops into a sack below, leaving the seeds, which are too large to pass through, behind.

Indigo thrives best in a rich free soil and a warm situation frequently refreshed with moisture. Having first chosen a proper piece of ground and cleared it, it is made into little trenches, not above two inches deep, two inches and a half in depth, nor more than fourteen or fifteen inches asunder. In the bottom of these, at the season of the year, the seeds are strewn pretty thick

immediately covered. As the plants shoot, they are frequently weeded and kept constantly clean, until they spread sufficiently to cover the ground. Those who cultivate great quantities, only strew the seeds pretty thick in little shallow pits, hoed up irregularly, but generally within four, five, or six inches of one another, and covered as before. The plants grow to full perfection in two or three months, and are observed to answer best when cut in full blossom. They are cut with reaping-hooks a few inches above the root, tied in loads, carried to the works, and laid by strata in the steeper.

In cultivating the coffee, the berries are sown immediately after being gathered, as they are found to retain their vegetative quality only a few weeks. In three months they are fit to transplant, either to a nursery or to a final plantation. In the low lands, they are planted five feet apart, and in the mountains ten feet or more. In three years, the plants will produce a crop, and continue bearing for a number of years. The berries are gathered when they are just about to drop; and are immediately carried to sheds, where they are dried upon cloths, or mats, till the husk shrivels. They are then passed through between wooden rollers turned by a mule, which separates the husk, after which they are winnowed, sifted, cleaned, exposed to the sun for a few days, and then barrelled up for sale."

Various European animals thrive remarkably well in some of the islands. Amongst these may be mentioned the ox, which is much used both for food and labour. Oxen never attain such a size in tropical climes as in this country; and from the labour they have to undergo, the beef is not so good. Horses and mules are abundant in Jamaica, they being principally used for riding or drawing light burdens. Sheep are also plentiful, but the mutton is coarse. Pigs, especially such as are fed upon sugar estates, are very highly esteemed as food; their flesh being described as exceedingly delicate. Goats are kept in considerable numbers for the sake of their milk, which is thought better than that of cows. Fish are very abundant on the shores of every island, and form an important article of consumption. Their flesh is described, however, as pulpy, and not to be compared to that of the salmon. The most delicate are those caught in the mountain streams; and sea and land turtle are also frequently met with. Oysters are to be seen hanging on the pendant branches of the willow, which grow into the water. The black crab of Jamaica is esteemed as a great delicacy; and is somewhat peculiar in its habits. They burrow in the sand during one season, and at others they are frequently found far into the interior of the country. It is supposed that they migrate across the islands on which they are found annually. The domestic fowls are numerous, comprehending almost every kind known in this country, except geese and the common duck. In place of these, however, the Muscovy duck, the turkey, and the Guinea fowl, thrive remarkably well.

The green turtle is very common in many of the West India islands, and is much prized as an article of food. This species derives its name from the fat being green, and is that most esteemed by epicures. There are very few shell-fish in the West Indies which are either useful or ornamental. The most beautiful are the horned helmet, the strombas gigas, and the rare plecocheilus undulatus, which is confined to St. Vincent alone.

With such resources, it may be supposed that the inhabitants live in comfort, from the highest to the lowest. The mode of life followed in Trinidad, as described to us by a resident, is to rise at five, get a cup of coffee, and go to business till seven. Breakfast is then served, and business is suspended for two or three hours during the heat of the day, during which time the reading-room is much frequented. Work again commences at four or five in the afternoon, and is given up altogether at nine in the evening.

INSECTS, REPTILES, BIRDS.

One of the most annoying pests of the West Indies is the myriads of ants that everywhere swarm, as well within as without doors. There are innumerable varieties of them—some black, some brown, some large, and some very small. But, like all the other productions of nature, these little animals, which, by some superficial writers, have been called the "plague of the West Indies," prove of the most beneficial consequence to the health of the island. They are carnivorous, and prevent the accumulation of putrid animal matter. Their scent is remarkably acute, and a dead fly, wasp, or even mosquito, will not lie on the floor for two minutes, before a procession of ants will be seen issuing from some distant corner of the apartment, who drag off the prize bodily to their store-house, to be consumed at their leisure.

Perhaps the greatest annoyance experienced by new settlers in these islands is from the bites of the mosquitoes, although these animals are not nearly so formidable there, in size or sting, as on the South American continent. In the latter they are so dreadful a plague, that people obliged to sleep out of doors can only find protection from the smoke of rank and green weeds thrown upon a fire to windward of them. In the islands, however, they are exceedingly troublesome, and a new settler may almost be recognised from the blotched and swelled appearance of his face, hands, and ankles—in short, every part of his person exposed to their venomous probosces. They resemble exactly our British midge, and are in fact of the same family of insects After a short residence, they cease to be any annoyance to Europeans, who become callous to their stings, and whom, indeed, they cease to fix upon after being some time in the country. They do not at all trouble the Negroes, whose oily skins are impervious to their stings. They are most tormenting during the night, and, to guard against their attacks, gauze curtains are hung round the bed of every respectable inhabitant in town or country. The process of getting into bed without admitting any of these tiny persecutors, is one requiring great dexterity, and not a little scientific manœuvring, as will be seen by a most humorous description, given by Captain Basil Hall in the third series of his entertaining "Fragments;" and which, although applying to the eastern hemisphere, is equally applicable to the west.

Another of the pests of the West Indies is the *chigre*, a small invisible insect, which enters the skin, and unless extracted speedily, breeds the most disgusting sores. They abound chiefly on the coffee plantations. After getting into the flesh, they will hatch a colony of young chigres in a few hours. They will not live together, but every chigre sets up a separate ulcer. Their presence is known by a sharp itching of the part.

The cockroach is a large and disgusting insect, but harmless. It resembles our cricket in appearance, and abounds in thousands.

One of the most singular of the animal phenomena peculiar to the West Indies, are the fire-flies. The light emitted from their bodies is phosphorescent, and only glows during the night. "I was in the habit," says a writer of Jamaica, in our Journal, "almost nightly, of enclosing a dozen or more of fire-flies under an inverted glass tumbler on my bed-room table, the light from whose bodies enabled me to read without difficulty. They are about the size of a bee, and perfectly harmless. Their coming forth in more than usual numbers is the certain harbinger of impending rain; and I have frequently whilst travelling, met them in such myriads, that, be the night ever so dark, the pathway was as plain and visible almost as at noon-day. The light they emit resembles

exactly the lustre of the diamond, and I have been told that it is no uncommon thing for the Creole coquettes to insert a few of them, confined in pieces of thin gauze, amongst their hair, and in various parts of their dress, just as our belles at home avail themselves of the ingenuity of the paste-jeweller."

There are few poisonous reptiles in the West India islands besides the scorpion, which is very numerous. It lodges principally about old walls and the trunks of felled and decayed trees; its bite always produces fever, and often causes death. There are many varieties of serpents, but they are almost all harmless. The kind most common in Jamaica is the yellow snake, which is frequently found of seven and eight feet in length. It often comes into the houses; and one of them is reckoned an excellent prize by the negroes, from the great quantity of oil it yields.

One of the most common of the reptile tribe is the lizard, exactly resembling the alligator in shape. These animals are to be seen frisking about in thousands throughout all the interior, especially about the public roads. Some of them are two feet long; and many of the inhabitants consider them a great delicacy when stewed. Their flesh is white, and resembles that of a chicken or rabbit.

Amongst the most destructive of the animals which infest the West Indies, is the rat, which is very large in size. The history of this animal is somewhat peculiar. It was introduced into several of the West India islands about fifty years ago, by Sir Charles Price, for the purpose of extirpating the native rat. This it soon did most effectually, but at the same time overran the island itself, proving by a thousand degrees a greater pest than its predecessors. It annually does great damage to the cane-grounds. One of the first animals which attracts the attention of a stranger in the West Indies, is the large carrion-crow, called by the Negroes the "John-crow." It is a large, heavy, sluggish bird, about the size of a British turkey, the head exactly resembling that of the latter. It is black in colour, and in the interior of the country is seen floating at an immense height above every hamlet. Its sense of smell is so keen that it will discern the effluvia from the body of the smallest dead animal at several miles' distance; and has been known to scent the dead bodies in wrecks when the vessels themselves were out of sight of land. They are found so beneficial to the health of the island, in thus consuming all putrid animal substances, that a fine of a doubloon (£5 currency) is exacted for killing one of them. When sickness prevails in a house, these birds perch upon the roof even in the midst of towns, where they will remain for many days, as if waiting for their loathsome banquet—in the same manner as sharks are said to attend sick ships at sea.

CONDITION OF THE NEGRO POPULATION.—TRADE, &c.

Previous to 1834, the British West India islands were all cultivated by Negro slaves; but in that year a bill passed the Houses of Parliament by which slavery was abolished, the planters receiving £20,000,000 sterling as the price of Negro emancipation. This bill declared that after the 1st of August, 1834, all slaves should become apprenticed labourers; the apprenticeships to cease in August, 1840. In the interval, disturbances occurred, and much property was damaged, from the Negroes believing that they had now only to work for themselves; but in the course of a few months they returned to their labour. This they did, however, with great reluctance; and in many instances the crops were ruined for want of sufficient attendance. The produce of the islands in consequence greatly decreased; nor has it yet reached the amount it stood at before the passing of the Emancipation Act. The island of Antigua totally abolished slavery in 1834, without requiring the stipulated apprenticeship; and it is highly gratifying to know, that the amount of crime greatly decreased in this island since that period. Bermuda followed the example of Antigua, which was imitated by many of the smaller islands, and afterwards by Barbadoes. Jamaica and some other islands, however, held out till August, 1838, when slavery was finally abolished in the British West India islands. It was anticipated that this event would lead to a considerable degree of social disorganization, but nothing of the kind occurred; and the conduct of the emancipated Negroes, who now may be termed the *peasantry* of the West Indies, has been peaceful and orderly; and on all occasions they have manifested a desire to work at fair wages, and to improve their moral and intellectual condition. Mr. Gurney (a member of the Society of Friends,) who travelled through the West Indies in 1840, and has published the result of his investigations, corroborates all official information on this subject, and describes the improvement of habits and desires among the peasantry as most remarkable. The only dispeace that has occurred in the islands, has, it seems, been caused by employers exacting heavy rents for cottages and provision-grounds; but this source of disquietude, we believe, no longer exists, and tranquillity and industry everywhere prevail.

In Dominica, he found the Negroes manifesting great anxiety for instruction—a thing that cannot be said of English peasantry. One day, he observes, "The people gathered around us, and a woman came forward on behalf of the company, to beg for a school. 'We are hungry for a school,' said she; 'we are tired of waiting for it.' Nor were these idle words; for the people on this and a neighbouring property had agreed to subscribe eight dollars per month in part payment of a teacher. Nothing, indeed, can be more eager than the desire of the Negroes of Dominica for education—they seem determined to obtain it; and it is gratifying to know that the efforts now making for the purpose are at once considerable and successful. There are nearly 700 scholars in the four Mico schools, which are ably conducted, and being quite clear of any peculiar religious bias, are acceptable to the whole population." This forms an agreeable piece of information. In Dominica, a majority of the lower house in the legislature is composed of coloured persons, and the same class of persons are now eligible as jurors, both in this and other islands: it becomes absolutely necessary that the people should, by means of instruction, be prepared for performing these functions with propriety. Another circumstance which fell under Mr. Gurney's notice at Dominica deserves to be made widely known. During slavery, it was below the dignity of any free person to labour in the field; and all who could do so preferred to live in idleness rather than work. The abolition of slavery has removed this detestable plea for living in a state of slothful indulgence. *It is now quite respectable to work*—labour in the fields is not discreditable. This indicates an important social improvement. In speaking of Jamaica, Mr. Gurney shows, that a coffee estate which he visited is now conducted at a much cheaper rate than during slavery, when the planters were obliged to support not only the actual workers, but all the young, old, sick, and idle. The owner of the estate in question described the two different conditions of affairs as follows:—"One hundred and seventy slaves, or apprentices, used to be supported on this estate. Now, our friend employs fifty-four free labourers, who work for him four days in the week, taking one day for their provision-grounds and another for market. This is all the labour that he requires in order to keep up his former extent of cultivation. And willingly did he acknowledge the superior advantage which attends the present system. The saving of expense is obvious.

"I understood our friend to allow that the average cost of supporting a slave was £5 sterling per annum.

170 slaves, at £5 per annum, is - - - -	£850	0 0
Now, he pays 54 free labourers 4s. 6d. per week, one day's labour being set off against rent, for 50 weeks, two weeks being allowed for holidays. - - - - - - - - -	607	10 0
Saving under freedom, - -	£242	10 0"

In the course of another journey, Mr. Gurney offers the following useful fact:—"'Do you see that excellent new stone wall round the field below us?' said the young physician to me, as we stood at A. B.'s front door, surveying the delightful scenery. 'That wall could scarcely have been built at all under slavery or the apprenticeship; the necessary labour could not then have been hired at less than £5 currency, or 15 dollars per chain. Under freedom, it cost only from 3½ dollars to 4 dollars per chain—not one-third of the amount. Still more remarkable is the fact, that the whole of it was built under the stimulus of job-work, by an invalid Negro, who during slavery had been given up to total inaction.' This was the substance of our conversation; the information was afterwards fully confirmed by the proprietor. Such was the fresh blood infused into the veins of this decrepid person by the genial hand of freedom, that he had been redeemed from absolute uselessness—had executed a noble work—had greatly improved his master's property—and, finally, had realized for himself a handsome sum of money. This single fact is admirably and undeniably illustrative of the principles of the case, and for that purpose is as good as a thousand." Of the condition of Jamaica generally, Mr. Gurney observes—"The imports of the island are rapidly increasing; trade improving; the towns thriving; new villages rising in every direction; property much enhanced in value; well-managed estates, productive and profitable; expenses of management diminished; short methods of labour adopted; provisions cultivated on a larger scale than ever; and the people, wherever they are properly treated, industrious, contented, and gradually accumulating wealth. Above all, education is rapidly spreading; the morals of the community improving; crime in many districts disappearing; and Christianity asserting her sway, with vastly augmented force, over the mass of the population. Cease from all attempts to oppose the current of justice and mercy—remove every obstruction to the fair and full working of freedom—and the bud of Jamaica's prosperity, already fragrant and vigorous, will soon burst into a glorious flower."

Notwithstanding the symptoms of industry and improvement which prevail, it happens that the West Indies suffer from a general deficiency of labourers, and to relieve this serious difficulty various schemes have been adopted, though without any important result. Whether from this deficiency or from the effects of the seasons, the produce and trade of the islands have not kept pace with the improvements in their social condition. We have been unable to find any official statement which can furnish a view of the export and import trade during late years. In 1833, the exports from the West Indies amounted to £8,008,248, and in 1834 they were only £5,410,113. The exports of these colonies are considerably greater than their imports, and consist of four leading articles—sugar, rum, molasses, and coffee. In 1835 they sent out 3,624,209 cwts. of sugar, 5,453,317 gallons of rum, 507,627 cwts. of molasses, and 14,866,580 lbs. of coffee. Much the largest export from any individual colony was from Jamaica. The imports from the United Kingdom in 1838 amounted to £3,393,441, a sum so inferior to the value of the exports, that there must be a great payment to the planters in cash.

The principle on which the trade with the West Indies is conducted, like that of all our colonies, is pernicious in the extreme. It consists in our obligation to prefer buying from them instead of from Brazil, or any other foreign country, which could supply us at a cheaper rate. While we now write, for example, sugar could be imported into Britain from Brazil at less than half the price we are paying for it to the West Indies. The people of the United Kingdom are in this manner, as it is calculated, losing several millions per annum, exclusively of civil and military expenses. It is needless, however, to dilate on this absurd system of trade, as at present certain plans are in contemplation for revising the tariff of import duties, which leads to such decided injury to the mother country, and which is compensated by no commercial advantage whatsoever.

The currency employed in the West Indies is an imaginary money, and has a different value in different colonies. The following are the values of £100 sterling, and of a dollar, in the currencies of the different islands:—

	Sterling.	Currency.	Dollar.	Currency.
Jamaica, - - -	£100 =	£140	1 =	6s. 8d.
Barbadoes, - - -	100 =	135	1 =	6s. 3d.
Windward Islands (except Barbadoes), - -	100 =	175	1 =	8s. 3d.
Leeward Islands, - -	100 =	200	1 =	9s.

As far as we know, there is not any census of the population of the West Indies later than that of 1834. The following is the census for that year: the number of the population in Jamaica, however, is only an approximation, there being no available census for that island:—

Colonies.	Whites.	Free Coloured.	Apprenticed Labourers.	Totals.
Antigua, -	1,980	33,432	...	35,412
Barbadoes, -	14,959	5,140	82,807	102,012
Dominica, -	840	3,606	14,384	18,830
Grenada, -	801	3,786	23,536	28,123
Jamaica, -	30,000	...	...	347,692
Montserrat, -	330	974	6,355	7,659
Nevis, -	700	2,000	8,722	11,422
St. Kitt's, -	1,612	3,000	20,660	25,272
St. Lucia, -	881	3,019	13,438	18,148
St. Vincent, -	1,301	2,824	22,097	27,122
Tobago, -	280	3,000	11,621	14,901
Virgin Isles, -	477	1,296	5,192	6,965
Trinidad, -	4,201	18,724	22,359	45,284
Bahamas, -	4,657	4,211	9,705	18,573
Bermudas, -	4,264	4,456	...	8,720
Demerara, -	3,006	6,360	65,556	74,922
Berbice, -	570	1,651	19,359	21,580
Honduras, -	256	1,788	1,920	3,964
Anguilla, -	365	327	2,388	3,080
Total, -				820,578

DESCRIPTION OF THE EAST INDIES.

GEOGRAPHICAL BOUNDARIES.

India, or Hindostan, or the East Indies, as it is called, to distinguish it from the West India Islands, is a large country in Asia, forming, as may be seen by the prefixed map, an extensive triangular-shaped territory, pointing with its narrow peninsular extremity southward to the Indian Ocean. India is nearly comprehended between the latitudes of 8° and 35° north; its extreme length from north to south is about 1900 miles, and from east to west about 1500; its superficial area measures 1,280,000 miles. The northern boundary of this extensive region is formed by a range of mountains running from east to west, which are higher than any other on the surface of the globe, some of them reaching 25,000 feet above the level of the sea: they are called the Himaleh Mountains, from an Indian word, *heem*, signifying snow—some of their peaks being perpetually clothed with ice and snows. From the extremities of this mountain chain flow two large rivers, which form on either side the boundary of India; that on the east is called the Brahmaputra, and that on the west, the Indus—a river from whose name the whole country has derived its present designation. Each of these streams with its tributaries water an immense tract of fertile country, and afford excellent means of internal trade to the people situated on the banks. From the mouths of these rivers the coast stretches both ways to the southward, the eastern and western side inclining to the same point, so as to meet at Cape Comorin. Beyond this, the adjoining Island of Ceylon extends a little farther outward, and reaches to within about six degrees of the equator.

This large country presents a great variety of surface, being diversified in some places with wide sandy deserts; in others with fine undulating hill countries, well watered and fertile; a third portion consists of flat, high-lying regions, called table-lands, which, from their height above the sea, are cool and temperate; and a fourth division consists of immense fertile plains, watered by the large rivers of the country, and their numerous tributaries. A considerable portion of the low-lying country is of a marshy, shrubby character, called jungle, and unfitted for cultivation. Each of these divisions of India presents an aspect peculiar to itself, and all of them are distinguished by natural productions, both plants and animals. Besides the Indus on the west, and the Brahmaputra on the east, there are other large and important rivers descending from the outskirts of the Himaleh Mountains, or from ranges of hills called Ghauts, and descending to the sea both on the east and west coasts. The principal of these streams is the Ganges, which, with its tributaries, drains a large portion of the north-east division of the country, and enters the sea in the province of Bengal, along with the conjoined waters of the Brahmaputra. The valley of the Ganges, and the valleys of its tributaries, form the finest and richest portion of India. This district, in its largest extent, may be described as a semicircle, with its base extended along the line of the Himaleh Mountains, and its curve running along from Soodiana on the Indus, to Delhi, Gualior, Punnah, Sumbhulpoor, and Balasore, where it meets the sea and the mouths of the Ganges, thence along the coast to Chittagong, and north by Silhet and Rungpore, to include the country of the Brahmaputra.

The first sight of India to European voyagers has little which can please or interest. The coasts are remarkably flat, and frequently dangerous to approach through the raging surf; the shore is only discernible by the tall cocoa-trees which surround the villages or temples. This extreme flatness of the shores of India is one of the peculiar distinguishing traits of the country, and is exceedingly disadvantageous in a maritime commercial point of view.

The southern district of this magnificent valley is called Bengal, and extends along the sea from Chittagong to Balasore, about four hundred miles, and reaches about the same distance northward. The sea-coast is not the most fertile or useful part of this territory; great part of it towards the centre being composed of marshy ground, or of mud islands, among which the branches of the river are spread like net-work. These islands are covered with a rank vegetation of reeds, which are sometimes twenty or thirty feet high; or with trees and underwood so tall and dense that it is impossible to penetrate them. They afford shelter to tigers and other wild animals, but the air of the whole of them is pernicious to health. About 150 miles upwards, the soil becomes higher and less marshy, so as to afford good ground for cultivation; and the country is here fertile and thickly peopled. It is in this district, immediately above the mouths of the Ganges, that Calcutta, the capital of British India, is situated. The inundations of the Ganges cover and fertilize immense tracts of the level country near the river, while others more remote procure the same advantages from an artificial irrigation. Luxuriant fields, divided by groves of tall trees, with villages under their shelter, and swarming with a population beyond any thing that Europe can show, form the general features of the vast alluvial plain of Bengal

DIVISIONS OF THE COUNTRY.

The modern territorial and political subdivisions of India may thus be specified:—First, Northern Hindostan, an extensive and rugged territory, comprehending—

1. The country between the Sutuleje and Jumna.
2. Gurwal or Serinagur.
3. Sources of the Ganges.
4. Kemaoon.
5. Painkhandi.
6. Bhutant.
7. Dominions of Nepaul.

Second, Hindostan Proper, which is the most comprehensive division. It stretches across the centre of India, and obtains the most prominent place in the history of the old Mohammedan empires of India. It reaches south to the Nerbudda river, where the Deccan commences, and includes the following thirteen large provinces:—

1. Bengal.
2. Bahar.
3. Allahabad.
4. Oude.
5. Agra.
6. Delhi.
7. Lahore.
8. Cashmere.
9. Ajmeer.
10. Mooltan.
11. Cutch.
12. Guzerat.
13. Malwa.

Third, The Deccan.—This division lies next, in a southerly direction, to the above, extending from the Nerbudda river on the north, which flows into the sea on the west coast, to the Krishna, a river flowing into the sea or Bay of Bengal on the east coast. Between these rivers lies the Deccan, a much less fertile division of India than the preceding; Bombay, a small island on

the west coast, belongs to the province of Aurungabad in this division. The Deccan comprehends the following provinces, a portion of which once formed the Mahratta empire:—

1. Gundwana.
2. Orissa.
3. The Northern Circars.
4. Candeish.
5. Berar.
6. Beeder.
7. Hyderabad.
8. Aurungabad.
9. Bejapoor.

Fourth, India South of the Krishna.—This division forms the extreme southerly portion of the Indian peninsula, and comprehends the following provinces:—

1. Canara.
2. Malabar.
3. Cochin.
4. Travancore.
5. Balaghaut, ceded districts.
6. Mysore.
7. Coimbatoor.
8. Salem, and the Barramahal.
9. The Carnatic, in which is situated Madras.

Besides the foregoing divisions and provinces, the large territories of Ava and the Burmese empire, lying east from the Brahmaputra, are now attached to India, besides other conterminous regions in different quarters.

HISTORY.

What was the original political condition of the vast territory now composing the British Indian empire, it would be needless to detail minutely. Like other portions of Asia, it was early inhabited by a primitive people, more or less barbarous, professing different pagan religions, and speaking many more different languages. The principal religion, however, was Hindooism, which we shall afterwards allude to; and it has been said by some historians that the early Hindoo race of inhabitants manifested many symptoms of civilization, and even a knowledge of some of the sciences. However this may have been, the inhabitants generally were in some measure an industrious but simple race, and little inclined to war. Reasoning from what has occurred in their history, as well as from the information communicated regarding them, they seem, from the earliest times, to have had little or no care with regard to who ruled over them, provided they were insured in the possession of their ancient religious usages, and their system of living in small communities, under a primitive species of local government. They were reckless of what sovereign was placed over them, or to what dynasty they were transferred, so long as the internal economy of their village districts remained the same. The species of political apathy produced the results which might have been expected. From the most remote period of which any record is preserved, the inhabitants of India, including those tribes which possessed more decided warlike propensities, or who had the spirit to resist aggression, were subjected to the government of strangers, who seized upon their territories, and made them the objects of taxation. Among other warlike princes who thus made inroads on the country, Alexander the Great, in the course of his ambitious career, marched with an army to India, the northern part of which he conquered.

Of this remote period of Indian history, little is correctly known; all that may be said of it is, that both the Greeks and Romans were supplied with some of their articles of luxury from Hindostan, and that for many centuries this eastern clime was supposed, by the ill-instructed inhabitants of distant parts of Asia and Europe, to be the richest and most sumptuous country on the globe. The tales related of Indian grandeur appear to have in time excited the avarice and ambition of Mohammedan or Saracen chiefs. The first of this barbarous though intrepid race, who made a successful inroad upon India, was Muhmood, sultan of Ghizni, or Affghanistan, a kingdom on the north-west of India. Mahmoud commenced his successful expeditions into India about the year 1000 and he continued them till 1024, making the destruction of pagan idolatry more the object of his visits than the acquisition of wealth or power. In this period of twenty-four years he had subdued a considerable number of the native princes, and, notwithstanding his professions, exacted immense tributes in gold and every kind of valuable commodity. A successor of Mahmoud, named Mohammed, after carrying on war with the Indian princes for some time, at length, about the year 1193, entered Hindostan with an exceedingly large force, and bore down all opposition. The king of Delhi was slain in battle, and having advanced to that ancient capital, Mohammed there left a viceroy to maintain his authority. In this manner a Mohammedan dominion was for the first time established in the heart of India, and in one of its greatest cities; and thus commenced the Affghan or Patan sovereigns and their dynasty.

The dynasty so planted continued in existence for rather more than three hundred years, when, in 1525 or 1526, it was subverted by Baber, who was considered one of the most adventurous warriors of his time, and who, like his prototype Mohammed, was of the Moslem faith. Baber was either descended from a Mogul or Tartar chief, or in some way, not clearly explained by historians, connected with a race called Moguls, who assisted him in his attempts upon India; and from causes of this nature, the empire which he founded in Hindostan has ever since been called the Mogul empire. From the year 1526, a series of Mohammedan emperors, whose seat of authority was at Delhi, ruled the largest and finest portions of India. By them the country was in many places newly subdivided into provinces, and put under the government of tributary kings or nabobs, who superseded the Hindoo rajahs or petty princes. One of the greatest of these Mogul emperors was Akbar, who flourished between the years 1556 and 1605. By his daring and judicious management, the central provinces were preserved in complete tranquillity, and Guzerat, Bengal, and part of the Deccan, were added to his already extensive empire.

While the emperors of India were thus establishing their power, multifarious schemes were formed in Europe for getting possession of some of the wealth, if not some portions of the territory, of Hindostan. The commodities of Indian manufacture or produce were hitherto imported into the European states only by means of tedious overland journeys, or partly by the Red Sea, and were endangered in their passage by the attacks of ferocious Tartar and Turkish tribes. The discovery of a new and safe road to India thus became a matter of very great consequence. A route by sea round the Cape of Good Hope was at last found by the Portuguese, who, under the command of Vasco de Gama, in 1498, landed in Hindostan, on the coast of Malabar, where they at once established themselves. The whole commerce of the East Indies was now in the hands of the Portuguese for nearly a century—and this was the golden age of Portugal. Lisbon became the great depôt of Indian spices and other commodities, greatly to the envy of the Dutch and other nations. Portugal was united to Spain in 1580—the Spaniards oppressed Holland, and caused it to revolt—this revolt was followed by the capture of the Dutch ships trading to Lisbon—and this capture compelled the Dutch to engage in a direct trade to India. The English soon followed their example. The political and spiritual tyranny of the Portuguese in India, as well as the abuses which they permitted in commerce, gradually subverted their power, and divested them of respect. The Dutch and English, therefore, found every thing in that state of division which is favourable to the establishment of a third party. The Dutch established an East India Company in 1602, and a prosperous trade was thereafter carried on. The Dutch adopted quite a different line of policy from that of the Portuguese in their

transactions with India. They cared nothing about the religion of the Hindoos, and set up no inquisition to force Christianity on those they dealt with: all they wanted was commercial intercourse, and their excellent management soon secured them a large share of the Indian traffic. They possessed themselves of Batavia, in the island of Java; in 1641, they acquired Malacca, the capital of the Portuguese East Indies; they subsequently acquired the Cape of Good Hope for a settlement; and these colonies were a great assistance to the intercourse between Europe and India. The Dutch subsequently acquired a number of other possessions in the East; but most of these came afterwards into the possession of the British.

We now enter upon the history of the rise and progress of the British power in India. The English became animated with a desire to open a commercial intercourse with India as early as the reign of Edward VI. (1553); but their expeditions failed in reaching the desired country, from their want of geographical knowledge: and it was not till the shutting of Lisbon against the Dutch, that they were so far excited as to persevere in their maritime attempts till they were successful. They at length learned which was the true course to steer for India; whereupon, in 1600, a company of merchants was formed in London to prosecute the traffic with the East; being empowered to do so by a charter from Queen Elizabeth, which was to last fifteen years. The first expedition of these adventurers cost £69,091, and consisted of five ships, the largest of which was 600, and the smallest 130 tons burden. The articles which they took were principally bullion, iron, tin, broad-cloths, cutlery, and glass. This expedition proved remarkably successful, and led immediately to a repetition of annual voyages of the same nature. This early trade was nevertheless considerably hampered by the Portuguese; and it was found necessary to try to secure the favour of the Mogul emperor. In 1607, therefore, Captain William Hawkins was sent out by the Company, to endeavour if possible to open a commercial intercourse with the dominions of the Mogul. Hawkins, after surmounting great difficulties placed in his way by the Portuguese, reached the court of the Mogul emperor Jehangire, son of the famous Akbar, already mentioned. This visit was unfortunately of no avail, from the pernicious interference of the Portuguese Jesuits; and another English mission, on a greater scale, and from the king, was sent forth in 1615. This embassy, which was conducted by Sir Thomas Roe, proved more successful in securing the favour of the Mogul, but did not lead to any important results. The affairs of the Company, nevertheless, continued prosperous, and factories were in many places planted on the coasts of India. These factories were warehouses for the reception of native produce, and the storing of imported goods from England, and were no doubt of considerable use in the objects of their establishment. From the real or pretended dread of being attacked by marauders, the keepers, merchants, and servants, at these places, at length began to strengthen the defences; and so, from being mere mercantile warehouses, the factories partook of the decided character of armed garrisons. It does not appear that the native powers of India took any active measures to prevent this insidious process of planting settlements. The natives were fond of dealing with foreigners, and the princes were so eaten up with jealousy of each other, that the British always contrived to gain the friendship of one by taking part against another, and in the end getting the advantage of both. Besides, it was not for some time that the British disclosed any intention of securing the jurisdiction of provinces, or a property in the soil. A watchful hypocrisy led them to yield, on all occasions, a reverence towards the political sway of the native emperors, rajahs, and nabobs. The original East India Company, with its charters at different times disputed and renewed, continued throughout the seventeenth century to carry on a profitable traffic with the East. Its factories were extended to Java, Sumatra, Borneo, the Banda Islands, Celebes, Malacca, Siam, the coasts of Malabar and Coromandel. In 1610, the native authorities gave permission for the building of Fort St. George, at Madras; and in 1645, a factory was established on the banks of the Hooghley, a branch of the Ganges near its mouth, which formed the foundation of Calcutta. The island of Bombay was also procured as a settlement in 1664–5, after a struggle with its Portuguese possessors. The affairs of the Company were not, however, in a prosperous state; and soon after the Revolution of 1688, the question of the validity of the old royal charter was started. The consequence followed, of the Company not being able to perform its obligations, on account of losses occasioned by wars, infidelity of officers, extravagance, &c.; and Parliament, in 1698, granted a charter to a new East India Company, on condition of a loan of £2,000,000 sterling to the state, and which was required to carry on King William's wars. But the great contentions between the two Companies soon made it necessary to unite them, and a union was effected in 1702, when an act of Parliament was passed, establishing the conjoined association under the title of the United Company of Merchants, trading to the East Indies. Stock was raised by the sale of shares, and the shareholders to a certain amount were entitled to elect the directors of the Company.

The progress of the Company's settlements in India was, on several occasions about this period, caused by the superior skill of the British in medicine. In 1715, an embassy being sent on a commercial commission to Delhi, it happened that a medical gentleman named Hamilton, who accompanied the factors, had the good fortune to cure the Emperor Feroksere of a severe illness, which could not be overcome by the ignorant native physicians. In gratitude for this important service, though it is likely some very valuable presents from the Company had an equally liberalizing effect, the emperor granted liberty to the Company to purchase in Bengal thirty-seven townships in addition to that of Calcutta; he also conferred upon them some important commercial privileges, which soon rendered Calcutta a flourishing settlement.

The charter of the East India Company was from time to time renewed during the eighteenth century, though (but not without great difficulty) against a powerful opposition. But loans to government carried them always through these embarrassments. In 1744, they advanced £1,000,000 at three per cent., in consideration of an extension of their privileges till 1780. Hitherto we have seen this company of English merchants acting only for the avowed object of commercial intercourse with India; we now open a new page in their history, and show the origin of their political power.

The East India Company assumed the qualifications of a military and political power in the year 1748. But their advances towards territorial dominion were retarded by a rival, which gave them no small trouble. This competitor was France, which had in the mean time hastened to share in the commerce and spoils of India. In 1746, a French battalion had destroyed the army of the nabob of the Carnatic, and soon after the French officers succeeded in disciplining Indian troops according to the European method. The inferiority of the native Indian troops opposed to European soldiers, and the facility of instructing Indian soldiers, known by the name of *Sepoys*, in the European tactics, was thus proved. Ambition and avarice, political and mercantile cunning, could now act on a larger scale; and the inde

pendence of the Indian princes was gone whenever this trading Company, which was already encroaching upon all the rights, both of the rulers and the people of these countries, should establish a permanent military force. Thus far the military organization of the Company had been merely on the defensive; it now became able to act offensively; and the entire difference of the European and Indian notions of law could never fail to furnish opportunities to put this new means of power into action. The rights of succession, and all the rights of princes, subjects, and families, were so much disputed on the different principles of the Indian, Mohammedan, and British laws, that the Company, which often interfered as arbitrator, easily succeeded in extending their legal jurisdiction. If called to account in England for any of its undertakings, it was easy to uphold the correctness of its conduct, politically, on the ground of self-defence, which, at the distance of several thousand miles, could not be called in question; and, in legal matters, by taking advantage of the impenetrable labyrinth of the law. Edmund Burke, who experienced, in the case of Warren Hastings, the head of the Company's affairs in the east, this impregnability of the association, accused them justly "of having sold every monarch, prince, and state in India, broken every contract, and ruined every state who had trusted them." In 1749, the robberies of the Company began with the protection of the pretender of Tanjore, a fine province of the Carnatic. Under pretence of illegitimacy, the nabob of this district was driven out, for the purpose of obtaining some cessions of territory, and then restored on making further concessions. The rapid progress of the Company in the art of extending their possessions, appears from their treaties with Surajee-Dowlah, the nabob of Bengal, whom they contrived to depose in 1757, when large and rich provinces were the reward of their faithless policy. The French, who in a similar manner had acquired considerable territorial possessions in the Carnatic, now came into collision with the British merchants, and a hot war was carried on in India between these contending Europeans. The indecency of this conflict, as to which party should be the greatest robber, seems to have shamed both France and England, and commissioners were mutually sent to India to reconcile the differences which oristed, as well as to check the acquisition of territory either by the English or French companies. As a matter of course, this affectation of justice ended in nothing. After the commissioners had agreed that each should restore its acquired territories, and after a "solemn" treaty to that effect had been arranged, hostilities commenced as before. It would be needless to recount the particulars of this struggle for power; it will suffice to state, that the French ultimately were deprived by the British of their possessions.

By the defeat of the French forces in 1761, the British were left at liberty to pursue their schemes on India, being in no small degree favoured by the unhappy political condition of the Mogul empire. This large empire came under the rule of Aurungzebe, a descendant of Akbar, in 1658, and his reign lasted till his death in 1707. Under this celebrated Mohammedan emperor, the empire of the Moguls came to the height of its glory, and attained its largest extent. After Aurungzebe had added to it the kingdoms of the Deccan, it included nearly the whole peninsula of Hindostan, with the neighbouring regions of Cabul and Assam. The revenues extorted from this populous and wealthy territory amounted to £32,000,000 sterling. During the reign of Aurungzebe, it was attacked by the Persians under the bold prince Nadir, and also by a growing nation, called Mahrattas, whose kingdom comprehended large portions of the provinces of Malwa, Candeish, Aurungabad, and Bejapore, in the Deccan. By Nadir, and his successor Ahmed Abdallah, the Mogul empire, after the death of Aurungzebe, was almost entirely subverted to the character of a tributary to the Persians. Under these circumstances there was scarcely a native power that did not consider itself entitled to trample on the feeble authority of the throne of the Mogul; and between the Affghans, whose kingdom lay to the north-west, and the Mahrattas, the empire was distracted, and made the object of greedy contest. The Affghans were at length victorious over their enemy; and in 1753 they placed a descendant of the old dynasty on the throne, and in the possession of the empty but still venerated title of Great Mogul, to be the tool or captive of the first daring power which should seize the capital.

From this period the dignity of the empire was at an end, and a favourable opportunity was offered to the various dependent princes to throw off their allegiance, as well as to enterprising chiefs to take advantage of the unsettled state of things, and establish new kingdoms for themselves. In this state of general revolution, a bold Mohammedan adventurer rose from an obscure rank, named Hyder Ali, who, by summoning round him bold and predatory bands, and waging war with considerable address, established his power as a sovereign in the Mysore, a territory forming one of the most remarkable of those elevated table-lands that diversify the southern provinces. Hyder was succeeded in 1782 by his son Tippoo, a person equally bold, though less prudent and fortunate. Against both these powerful rulers the British for a number of years waged war with various success. In 1792, Seringapatam, the capital of the Mysore, was besieged by the Marquis Cornwallis, with a strong British army, and after some show of resistance, Tippoo was fain to offer terms of surrender. He agreed to give up half of his dominions, and pay £3,500,000 in bullion. For the fulfilment of the treaty, he was under the necessity of giving up two of his sons as hostages. Having fulfilled his engagement, these young princes were returned in 1794: but after this he again commenced hostilities, and in 1799 the British forces, under General Baird, once more attacked and now captured Seringapatam. In the general slaughter which occurred in entering this strongly fortified place, Tippoo was shot, and his body was afterwards found among a heap of the slain. Thus terminated a dynasty which, though short, and limited in respect of territorial dominion, was undoubtedly the most vigorous and best organized of any that had sprung out of the wreck of the Mogul empire. The principal war in which the East India Company was engaged after this successful contest, was that with the Pindarees, roving tribes of Mahrattas, who, without any territory, carried on predatory warfare against all whom they could rob with impunity. The war with the Pindarees was one of great difficulty, and it cost the British a number of years before they finally quelled them. The Pindaree war terminated in 1817, and it was followed by a contest betwixt the British and the Birman empire, which was successfully closed in 1826, and by which the Company gained a considerable territory along the Bay of Bengal, east of the Brahmaputra river. By the foregoing, and other less conspicuous contests with native princes, among which may be reckoned the war against the Nepaul, in 1814, and also by means of purchases, negotiations, and voluntary or involuntary renditions of territory, including the capture or cession by treaty of the French and Dutch settlements, the British power was at length established as supreme over nearly the whole of India.

EXTENT AND POPULATION OF INDIA.

The following has been given by the best authorities as an estimate of the extent and population of the territories now included in British India:—

	Square Miles.	Population.
Presidency of Bengal, -	220,312	65.710,071
Madras, - - - - -	141,923½	13.508,535
Bombay, - - - -	59,438¼	6,251,546
Districts, the population of which is doubtful,	91,250	
	512,923¼	89,470,152

According to another statement, the territorial extent is 514,190 square miles, and the population is 89,577,206. The territory of the allied or protected, that is, the subject states, is estimated at 614,610 square miles; their population, however, is not supposed nearly equal to that of the territories under the immediate government of the Company. Mr. Hamilton, in the second edition of his East India Gazetteer, estimates it as follows:—

The Nizam, - -	10,000,000
The Najpoor Rajah, -	3,000.000
The King of Oude, -	3,000,000
The Guickwar, -	2,000,000
The Satara Rajah, -	1,500,000
The Mysore Rajah, - - -	3,000,000
Travancore and Cochin, -	1,000,000
Kotah, Boondee, and Bopaul, -	1,500,000
Rajpoot and other petty states,	15,000,000
	40,000,000

The same author makes the following conjecture as to the states that still remain independent:—

Sindia, - - - - -	4,000,000
Lahore, Rajah Runjeit Singh, -	3,000,000
Sind, - - - - - -	1,000,000
Nepaul, - - - - - -	2,000,000
Cashmere and other districts belonging to the King of Cabul,	1,000,000
	11,000,000

This would give for the whole of India a population of upwards of 140 millions; but in the foregoing estimate, notice is not taken of the portion of India beyond the Ganges, including part of the Burmese territory, having, according to Mr. Hamilton, an extent of 77,000 square miles, and a population of 301,000.

Hitherto the Company have governed their Indian territories by means of the presidencies of Calcutta, Madras, and Bombay, each of these places being the head-quarters of a local military and civil government. In future there will be another presidency, that of Agra, a place of note in the interior. The whole are under the supreme control of a governor-general appointed by the British court; these governors-general seldom retain their situations above a few years. Mr. Pitt, in 1784, passed an act establishing a Board of Control, composed of six privy-councillors, to superintend the territorial concerns of the Company, which check is still continued, and reappointed under the act of 1833. To retain possession of so large a territory as India, the Company require to keep up a numerous and well-appointed armed force, which is composed chiefly of natives or sepoys, with British officers, and partly of troops raised in Great Britain. The Company further employ a number of queen's regiments, who have double pay allowed them. Mr. Hamilton gives the following statement of the amount of the forces employed:—

Artillery, - - - - -	15,782
Native cavalry, - - - -	26,094
Native infantry, - - -	234,412
Engineers, - - - - -	4,575
Queen's troops, - - - -	21,934
Total, - -	302,797

Of these, the irregulars of all descriptions amounted to 82,937 men. This formidable army of native and European soldiers is distributed throughout Hindostan, at appointed stations, forming a chain of military posts, and keeping up a continual communication with the seats of the various presidencies. Latterly, the number of troops may be different from that above stated. In 1830, they amounted to 224,444 men.

The relations which subsist between the Company and the tributary and dependent states may thus be described:—The Company undertake the defence of the dependent prince's territories against all enemies, domestic or foreign. He is bound, on the other hand, to enter into no alliances with other sovereigns or states without the Company's consent; and he pays them a certain annual subsidy out of his revenues for their protection, while he generally keeps up an army at the same time, for the maintenance of internal tranquillity. In some cases, instead of paying a subsidy, the prince cedes a portion of his territories, of which the Company draw the entire taxes. The Company keep a resident at the prince's court, who is entitled to demand an audience at any time; and by this agent, the Company do in fact interfere pretty regularly in the internal concerns of the state, particularly in settling the succession to the throne. The princes are in reality mere viceroys, or rather tax-collectors for the Company; and when in any state gross mismanagement or breach of engagement repeatedly occurs, these pageants are dethroned and pensioned off, and the Company take the government of the country into their own hands. The Company's protection is often found to shelter internal misgovernment; for the prince, being secured by the British army against the resentment of his own subjects, is tempted to indulge the more freely in extortion and oppression.

REVENUE SYSTEM OF INDIA.

To sustain not only the above military force, but the civil management of India, a revenue of £22,000,000 requires to be levied. About two-thirds of this large sum is derived from a tax on land; and as the mode of collecting, imposing, and administering it, enters deeply into the system of Indian policy, and has a powerful influence on the social condition of the people, we shall here attempt its explanation.

Under the old Mogul empire, the sovereign was considered the universal proprietor of the soil; but the ryots, or cultivators, or actual owners, were held to have a perpetual right of occupancy, so long as they paid the fixed annual tribute or rent demanded by the sovereign. The rent was fixed at a third, and sometimes at a half, of the value of the produce, and the functionaries appointed to ascertain the amount leviable, and to collect it, were called *zemindars*. In 1793, Lord Cornwallis, governor-general, with a view to establish a better system for all parties, changed the zemindars from the character of hereditary tax-collectors to that of proprietors of the soil, though still accountable to government for the rent. This created a vast deal of misery at the time; thousands of poor ryots were ejected from their ancient possessions; but ultimately the country at large was benefited. It was arranged that the sum payable by the ryot for several years, should be fixed as the permanent rent; one-tenth of this was allowed as the zemindar's share, and the other nine-tenths the proportion payable to the government or Company. The rent paid to the Company being fixed, great quantities of land which had been "concealed," that is, left out of the rough and partial returns formerly made, and which had lain in a wild state, or in pasture, were now put under crop. The practice is, to allow the ryot to occupy waste lands rent-free for three years, and to charge only a moderate rent for a few years more. In this way a considerable extent

sion of cultivation has taken place; and some of the zemindars have acquired wealth. From their improvident habits, however, such wealth seldom lasts more than one generation; and no progress has been made towards the institution of a rural aristocracy. The Company have begun very recently to retrace their steps. When zemindaries fall into their hands, as they are always doing from time to time, by the inability of the holders to fulfil their engagements, the Company replace the ryots as nearly as they are able in their original situation, allowing them to hold their lands under payment of a rent which remains fixed, either permanently or for a period of years. The Company in this case come in the room of the zemindar, and collect the rents in detail from the ryots by their agents.

This system of "zemindary settlement" prevails generally in Bengal, Bahar, Orissa, and Benares. It has also been tried on a small scale in the Madras presidency, but with very bad success; but in a modified form it has long existed in some parts of Southern India, where hereditary chiefs, called *polygars*, occupy a similar situation to that of the zemindars in Bengal.

There are other two modes of collecting the rent or land-tax (for it may receive either name); the *Ryotwar*, and the *Mouzawar*.

The ryotwar was first extensively introduced by the late excellent Sir Thomas Munro, when governor of Madras, in 1802. In this system, the government collects the rent directly from the ryots, without the intervention of zemindars. An actual survey was made, with great labour and expense, of the lands of the villages, in which it was attempted to fix the extent and value not merely of every occupancy, but of every field. The records showed the whole sum which the village had paid in former years; and from this, with the opinions of practised assessors, checked and guided by the advice of the village *potail* and *carnum* (the headsman and accountant), an estimate was formed of the gross produce, forty-five per cent. of which was assumed as the rent. The sum thus ascertained was fixed as the maximum which the tenant should be called on to pay. The rent is taken from the ryots in monthly payments, and very summary means are used to extort it. The system was extremely unpopular at its introduction, and occasioned great distress; but this was attributed to the excessive amount of the tax, rather than to defects in its imposition. The reader should be told, that the perquisites of the potail, carnum, brahmin, astrologer, schoolmaster, and a long train of other village functionaries, are supposed to absorb ten per cent. of the ryot's crop, so that the forty-five per cent. which government took in a good year, was, and was meant to be, one-half of the clear produce after this deduction was made. In consequence of the outcry against the tax, considerable abatements were made; and the ryotwar system remains in operation in a part of Madras presidency at this time, with, we believe, comparatively few complaints.

Village settlements.—The third system is the *Mouzawar*, or "village settlement." A village in India does not mean a collection of houses at a particular spot, but corresponds to what is called a township in America. "It is a tract of country (says Mr. Hamilton) comprising some thousands of acres of arable and waste land; politically viewed, it resembles a corporation or township. Its proper establishment of officers and servants consists of the following descriptions:—The potail, or head inhabitant, who has the general superintendence of the affairs of the village, settles the disputes of the inhabitants, attends to the police, and performs the important duty of collecting the revenues within his village—a duty which his personal influence, and minute acquaintance with the situation and concerns of the people, render him best qualified to discharge: the carnum, who keeps the accounts of cultivation, and registers every thing connected with it: the *talliar* (constable), or *totie* (watchman); the duty of the former appearing to consist in gaining information of crimes and offences, and in escorting and protecting persons travelling from one village to another; the province of the latter appearing to be more immediately confined to the village, consisting, among other duties, in guarding the crops, and assisting in measuring them: the boundary man, who preserves the limits of the village, or gives evidence concerning them in cases of dispute: the superintendent of the tanks and water-courses, who distributes the water therefrom for the purposes of agriculture: the brahmin, who performs the village worship: the schoolmaster, who is seen teaching the children in the villages to read and write in the sand: the calendar brahmin, or astrologer, who proclaims the lucky or unpropitious periods for sowing and thrashing: the smith and carpenter, who manufacture the implements of agriculture, and build the dwelling of the ryot: the potman, or potter: the fisherman; the barber; the cowkeeper, who looks after the cattle; the doctor; the dancing girl, who attends at rejoicings; the musician, and the poet. These officers and servants generally constitute the establishment of a village; but in some parts of the country it is of less extent, some of the duties and functions above described being united in the same person; in others, it exceeds the number of individuals which have been described. Under this simple form of municipal government, the inhabitants of the country have lived from time immemorial. The boundaries of the villages have been but seldom altered; and though the villages themselves have been sometimes injured, and even desolated, by war, famine, or disease, the same name, the same limits, and even the same families, have continued for ages. The inhabitants give themselves no trouble about the breaking up and division of kingdoms; while the village remains entire, they care not to what power it is transferred, or to what sovereign it devolves; its internal economy remains unchanged; the potail is still the head inhabitant, and still acts as the petty judge and magistrate, and collector or renter of the village."

It will be understood that, under the zemindary settlement, the government transacts with one individual for an extensive district, probably as large as a county; under the mouzawar or village settlement, it transacts with the chief person of the village for the whole community; and, under the ryotwar settlement, it transacts with each individual cultivator. It may be proper to add, that in India a ryot seldom holds more land than he and his family are able to cultivate, and that there are few farm-servants in our sense of the word.

Of the three modes of settlement, it may be stated that the zemindary plan has yielded the largest revenue; the method of "village settlement" does not cause much more trouble to the government, and is better liked by the cultivators; the ryotwar is the most expensive and troublesome, and has been the least productive of revenue; but it would be the most equitable and most advantageous to the people, if the ends of justice were not defeated by the frauds of the native officers intrusted with its details, and whose corruption is almost universal.

The revenue derivable from land by these various processes of exaction, amounts, as has been said, to two-thirds of the whole revenue of the Company, or the sum of £14,000,000. The next greatest head of revenue is the receipt from native princes, or from ceded and conquered countries, and which averages in amount from £7,000,000 to £8,000,000.

The Company have hitherto gained a million sterling per annum by the monopoly of opium. They have offered a price annually, which has been fixed at the lowest rate that will remunerate the producer; and ryots, whose lands have been suited to the cultivation, entered

into engagements to deliver certain quantities. About two-thirds of the opium used to be smuggled into China, until the Chinese stopped the importation; and one-third was sent to the eastern isles, Java, Sumatra, &c. Salt has also been an article of valuable taxation. It has been manufactured on the coast of the Bay of Bengal exclusively for the Company. Before it reaches the consumer, its price is enhanced five, eight, or ten-fold. The Company have realized a gross revenue of two millions per annum from this monopoly.

The customs drawn by the Company consist partly of taxes collected at the seaports on foreign goods brought in, and partly of *transit* duties levied on goods passing through the country. There are provincial duties paid in passing from one presidency to another; town duties on certain articles at the gates of towns; and market duties levied at the market stations where fairs are held. To collect these taxes, and guard against contraband trade, there are custom-houses, called *Chokies*, at every considerable village. In the single district of Madura, with a million of souls, in Madras presidency, there are twenty-one custom-houses, each of which has four or five subordinate establishments; and at these stations, even when no duties are exigible, fees are charged by the native officers for the trouble of examination, and a good deal of delay is caused in the transmission of merchandise. These taxes are sources of annoyance and occasional extortion to the trading classes. They produce a gross sum of £1,800,000, which is reduced to £1,600,000 by the charges of collection, &c. We believe that a considerable portion of the revenue derived from these duties on traffic is laid out by the Company in the construction of roads and bridges, where improvements of this kind are most wanted.

Territorial Revenue of India, for the year 1829–30.

Mints,	£36,483
Post-office,	132,565
Stamps,	424,692
Judicial (fees),	114,670
Land-revenue,	14,314,660
Customs,	1,837,127
Ceded territory,	569,678
Burmese cessions,	103,240
Salt,	2,421,619
Opium,	1,757,400
Marine,	61,769
Ava indemnification,	92,220
Bhurtpore,	34,800
Subsidies,	392,355
Bank profits,	8,640
	£22,301,948
Deduct over-estimation in land-revenues of Bombay,	247,500
Total revenues,	£22,054,416

In 1833–4, the annual revenue was £13,680,165, but this large sum scarcely covered the expenditure, including interest on the debt due by the Company, which at that time amounted to £35,463,483. As India, by the taxes which it contributes to the Company, clears the cost of its own protection and all its other expenses, it may be considered as the only foreign possession of Britain whose connection is not a cause of loss to the mother country. By means of its vast import trade, India forms one of the best customers for British manufactures, and is therefore a source of wealth to the United Kingdom. In this respect, India has been called "the right arm of England."

As may be generally known, an act of Parliament was passed in the year 1813, permitting the free trading of British subjects with India, reserving the commerce of China to the Company; the territorial and commercial branches were separated, as well as all accounts connected with them; and the king was empowered to create a bishop of India, and three arch-deacons, to be paid by the Company. This act, which was in force till the 22d day of April, 1834, did not afford perfect freedom of trade to India, yet it led towards that desirable result, and greatly increased the commerce with the East. By the act 3d and 4th Will. IV. cap. 85, passed in August, 1833, entitled "An act for effecting an arrangement with the East India Company, and for the better government of his Majesty's Indian territories, till the 30th day of April, 1854," the company were deprived of the exclusive right of trading with China, and ordained to close the whole of their commercial business, and make sale of their merchandise, stores, and effects, so far as regarded commercial assets. It was further ordained, that the whole debts of the Company should be chargeable upon the revenues of their Indian territories, but leaving a yearly dividend of ten per cent. to be retained by the Company; this dividend to be redeemable by Parliament. The Company to pay into the Bank of England two millions annually, till the sum of twelve millions is accumulated, as a security fund to the government. The other principal provisions were—A board of commissioners, to be appointed by the king, to superintend affairs of India; Bengal presidency to be divided into two presidencies—Fort William (Calcutta) and Agra; the whole government, civil and military, of India, to be vested in a governor-general and councillors.

The 81st clause is in these terms:—"And be it enacted, That it shall be lawful for any natural born subject of his majesty to proceed by sea to any port or place having a custom-house establishment within the said territories, and to reside thereat, or to proceed to and reside in, or pass through, any part of such of the said territories as were under the government of the said Company on the 1st day of January, 1800, and in any part of the countries ceded by the nabob of the Carnatic, of the province of Cattack, and of the settlements of Singapore and Malacca, without any license whatever; provided that all subjects of his majesty, not natives of the said territories, shall, on their arrival in any port of the said territories, from any port or place not within the said territories, make known in writing their names, places of destination, and objects of pursuit in India, to the chief officer of the customs, or other officer authorized for that purpose, at such port or place as aforesaid." Clause 86 permits his majesty's natural born subjects to purchase lands in India: 87 enacts that no native of India, or natural born subject of his majesty, shall, by reason only of his religion, place of birth, descent, colour, be disabled from holding any place, office, or employment under the Company: 111 enacts that St. Helena be placed under his majesty's government.

By this act, it will be perceived that several very important provisions are made for the benefit both of Hindostan and Great Britain. India is henceforth open to the settlement of British emigrants; trade may be carried on freely with either India or China; and Indo-Britons, Hindoos, or other natives, are now placed on a level as to political, military, or civil distinctions, with Englishmen. It is stipulated that the governor-general in council is empowered to legislate for India, and for all persons, whether British or native, foreigners or others: if the laws thus made by the governor-general are disallowed by the authorities in England, they shall be annulled by the governor-general. In virtue of these arrangements, it is evident that India, with all its social improvements, retains very much of the character of a despotically governed country; no part of the population having any right to interfere in the legislation or

executive. To enlightened foreigners this may prove an inconvenience; but, in the extraordinary condition of the whole Indian territory, a more liberal policy would most likely be unsuitable if not injurious. As it is, England may expect to derive very great advantages from the policy pursued. To use the words of Dr. Wallich, superintendent of the Company's botanic gardens at Calcutta—"The Company's territories in India are productive of every article which can conduce to the happiness of men; and it only requires skill, and ingenuity, and encouragement, both to the natives and Europeans in India, to select every thing that can possibly be desired." As the Indian population possess a taste for British manufactures, a reciprocal benefit will be the result of every increase of intercourse.

NATIVE POPULATION—HINDOOS.

The bulk of the population of India is composed of Hindoos, the primitive inhabitants of the country, and forming one of the most ancient nations in the world. This race was distinguished for their humanity, gentleness, industry, and were polished by letters and arts, at a time when most of their Asiatic neighbours were yet only in the first stages of civilization. This remarkable people have preserved their national character for thousands of years, even under the dominion of foreigners, and have retained to the present day their language, their written characters, their local government, religion, manners, customs, and habits of life. The Hindoos are in general of a brownish-yellow complexion, but the higher and richer classes are almost as white as Europeans. They are somewhat above the middle height, well proportioned, and very flexible and dexterous. Temperance, frugality, hospitality, and obliging manners, are the favourable traits in their character; but they are now reproached with indolence and avarice. With proper discipline, they form excellent soldiers and faithful servants of the Company. They possess great natural talents, but are at present deprived of opportunities for their development. They practise agriculture, breeding of cattle, fishing, hunting, and mining, and are largely engaged in manufactures, commerce, and navigation. They manufacture cloths of great variety and value, particularly cotton and silk, among which are the finest muslins and shawls, mats, cordovan leather, &c., and are inimitable in dyeing. In the arts of music and singing they are backward, but in dancing, statuary, and architecture, they are more advanced. They are acquainted with arithmetic, astronomy, and chronology, and are fond of poetry.

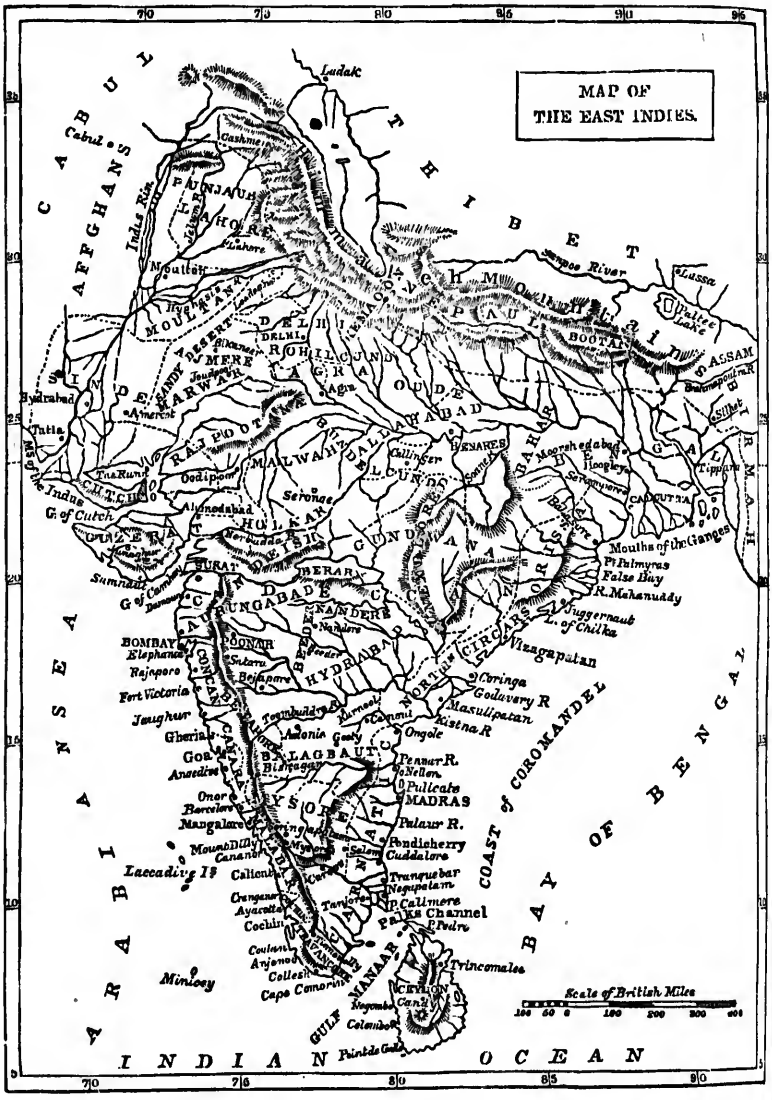
The most extraordinary peculiarity in the Hindoos is their division into *castes*, or perfectly distinct orders of society, which have existed from the remotest times. There are four castes, and it is strictly enjoined by the Hindoo religion that no transition from one to another shall take place; no connection between them by marriage or any other way is allowed, and no individual of one class can assume the habits or engage in the occupations of another. The distinction is complete in every sense, hereditary and personal; all the privileges or disabilities are inherited; no one is permitted to become what he is destined to be by his natural abilities, but is obliged to become only what his birth permits, or to remain what it condemns him to be. The slightest transgression of these laws is punished with loss of caste, and sometimes, in particular cases, with death. Even the difference of food is precisely marked out. The three higher castes are prohibited entirely the use of all flesh; the fourth is allowed all kinds except beef; all others are outcasts, and may eat what they please. Thus, the lower the rank of the Hindoo, the less he is restricted in his meat and drink; but, on the other hand, the burdensome restrictions increase with the inferiority of rank.

The first, or most noble caste of the Hindoos, are denominated Brahmins; they are priests, scholars, teachers, lawyers, and state officers, and are required to be virtuous, learned, peaceable, just and self-denying. The second order is the Kyetra, who are kings and warriors; and they are required to have a thirst for glory, to die rather than retreat, and to be generous to captives. They preserve the ancient name of rajnputs, by way of distinction, in their old hereditary dominions. The third order, which is called Bhysya, or Vaisa, are husbandmen and merchants. The fourth caste is that of the Soodras, who are labourers, and they are enjoined to serve with patience and fidelity. A lower caste, if it can be called such, are the Parias—those unhappy beings who have lost their station in the noble orders, and who are obliged to do whatever no one else can do without pollution. They are not only reckoned unclean themselves, but they render unclean every thing they touch. They are deprived of all civil privileges, and stigmatized by particular laws, regulating their mode of life, their houses, and their furniture; they are not allowed to enter the temples of the other orders, but must worship by themselves. Their houses are miserable hovels, distant from cities and villages.

The Brahmins, who are not legitimately entitled to possess property, and who must live upon the bounty of others for their support, cherish in the people the most debasing superstitions, and exact from them the most profound veneration. Instead of being holy, harmless, and undefiled, they are vicious, tyrannical, avaricious, and to the last degree impure. This infamous aristocracy is the curse of India, and presents a barrier to the attempts which have been made to meliorate the condition of the inferior orders. We believe the Kyetra and Bhysya castes are nearly extinct, and that the Hindoo nation is now composed principally of Brahmins and Soodras, with their subdivisions. These subdivisions are innumerable:—Every trade, every peculiar department of service, has its class, wherefore the retinue of servants to be kept is very large; for the man who carries in your water cannot wait at table, nor the man who cooks a dinner serve it up, nor the servant who waits at table sweep the room; and the same kind of classification goes on through all the pursuits of life. In a number of instances, Brahmins have become soldiers in the service of the East India Company, but without engaging in menial employments; and they still claim precedence even of kings, in point of etiquette. This rigorous classification of the Hindoos undoubtedly presents an obstacle to the advancement of Christianity, which, though hardly thought of by the British at home, is next to insurmountable, and will retard proselytism for an indefinite period. The Hindoo who becomes a Christian loses his caste by partaking of the Lord's Supper, and it therefore requires an extraordinary strength of mind to make a profession of faith in the gospel; for by losing his caste in this or any other way, no one will speak to him, or touch him, or have any intercourse with him—his own wife and family will disown him—he becomes a Paria, a dog.

From recent investigations, it appears that the foregoing rigorous classification of the Hindoos is much less an obstacle to improvement in manners than was formerly supposed. It would seem that the classification is more theoretic than practical. The altered state of society has obliged members of the aristocratic castes to engage in divers employments or trades not permitted by their religion; but to accomplish this object, various subterfuges and self-deceptions are practised. Besides, there have arisen a prodigious variety of subdivisions by the intermixture of castes; and the employments allowed to these mixed or impure castes may be said to be every description of handicraft and occupation for which the wants of human society have created a demand. In

point of fact, we are told by the best authority, that men of all castes may be seen working together in one handicraft employment. A kind of purity of caste is perhaps, nevertheless, kept up by the members of different castes not eating with each other, or not eating forbidden things. It is related that purity of caste is sustained by means of clubs or lodges scattered throughout Hindostan, and existing in considerable force in every large town; yet it seems that excommunication from these fraternities, is, upon the whole, unable to prevent the breaking down of ancient habits, or to subdue the disposition to imitate the English in the arts of civilized life



The Hindoo races are, indeed, described as now exceedingly anxious for improvement; and it is rational to expect, that, through the means of schools for education, and a conciliatory behaviour on the part of their British neighbours, they will attain no small degree of cultivation. On this subject, Bishop Heber—an authority on whom every dependence may be placed—makes the following statements in his work on India:—

"To say that the Hindoos or Musulmans are deficient in any essential feature of a civilized people, is an assertion which I can scarcely suppose to be made by any who have lived with them: their manners

least as pleasing and courteous as those in the corresponding stations of life among ourselves; their houses are larger, and, according to their wants and climate, so the full as convenient as ours; their architecture is at least as elegant; nor is it true that in the mechanic arts they are inferior to the general run of European nations. Where they fall short of us (which is chiefly in agricultural implements, and the mechanics of common life), they are not, so far as I have understood of Italy and the south of France, surpassed in any degree by the people of those countries. Their goldsmiths and weavers produce as beautiful fabrics as our own; and it is so far from true that they are obstinately wedded to their old patterns, that they show an anxiety to imitate our models, and do imitate them very successfully. The ships built by native artists at Bombay are notoriously as good as any which sail from London or Liverpool.

"In the schools which have been lately established in this part of the empire, of which there are at present nine established by the Church Missionary, and eleven by the Christian Knowledge Societies, some very unexpected facts have occurred. As all direct attempts to convert the children are disclaimed, the parents send them without scruple. But it is no less strange than true, that there is no objection made to the use of the Old and New Testament as a class-book; that so long as the teachers do not urge them to eat what will make them lose their caste, or to be baptized, or to curse their country's gods, they readily consent to every thing else: and not only Mussulmans, but Brahmins, stand by with perfect coolness, and listen sometimes with apparent interest and pleasure, while the scholars, by the roadside, are reading the stories of the creation and of Jesus Christ.

"The different nations which I have seen in India (for it is a great mistake to suppose that all India is peopled by a single race, or that there is not as great a disparity between the inhabitants of Guzerat, Bengal, the Doosb, and the Deccan, both in language, manners, and physiognomy, as between any four nations in Europe) have, of course, in a greater or less degree, the vices which must be expected to attend on arbitrary government, a demoralizing and absurd religion, and (in all the independent states, and in some of the districts which are partially subject to the British) a laxity of law, and an almost universal prevalence of intestine feuds and habits of plunder. Their general character, however, has much which is extremely pleasing to me: they are brave, courteous, intelligent, and most eager after knowledge and improvement, with a remarkable talent for the sciences of geometry, astronomy, &c., as well as for the arts of painting and sculpture. In all these points they have had great difficulties to struggle with, both from the want of models, instruments, and elementary instruction; the indisposition, or rather the horror, entertained, till lately, by many among their European masters, for giving them instruction of any kind; and now from the real difficulty which exists of translating works of science into languages which have no corresponding terms."

RELIGION OF THE HINDOOS.

The religious belief of the Hindoos is called Brahminism, and is founded on a most extensive collection of sacred records, of which the Brahmins are allowed to be the sole expounders. "These sacred writings (says Mr. Statham, in his 'Indian Recollections') are of two kinds—the Vedas and Shastres. The former may be termed their Scriptures, the latter expositions of them. Beass Muni (that is, Beass the Inspired), a prophet who lived in the reign of Judistheer, on the banks of the Jumna, near the present city of Delhi, collected all the detached pieces which form the Vedas, from all parts of India, and gave them their present form and arrangement. They are divided into four books, all written in the Sanscrit. The first book is called Rug Veda, which signifies the Science of Divination, concerning which it principally treats. The second is distinguished by the title of Sheham, which signifies Piety or Devotion, and this book treats of religious and moral duties. The third is the Judger Veda, which, as the word implies, includes the whole science of Religious Rites and Ceremonies. The fourth is denominated Obater Bah: in the Sanscrit, *obater* signifies the being or essence, and *bah*, good; this, literally interpreted, is the knowledge of the Good Being, and accordingly this book comprehends the whole science of theology and metaphysical philosophy.

"The Vedas, as also the Shastres or commentaries, pretend to great antiquity; so much so, that many Europeans have been strangely staggered in their belief of the Mosaic chronology by reading them. But it only requires a little consideration and research to discover a vein of imposition running through the whole of their details They reckon the duration of the world by four ages, or *jogues*, extending altogether to about eight millions of years; but the fallacy of this reckoning has been fully exposed by astronomical observation.

"The idea which the Shastres give of God, is that there is one supreme Being, whom they style Bhogabon or Esher, sometimes Khodah; proceeding from him, are three powers or deities, namely, Bruhmha, the Creator of all; Vishnu, the Preserver of all; and Seeb or Sheva, the Destroyer of all. Now, while the latter is worshipped by all, the former has scarcely any attention paid to his temples; and even Vishnu, the Preserver, has few votaries compared with the destroyer Seeb. Subordinate to these are 330,000,000 inferior gods and goddesses, each representing some peculiar virtue or vice. The Hindoos suppose that each of the three presiding powers oftentimes seeks to encroach upon the prerogative of his compeer, and thus are often quarrelling and seeking to subvert each other's arrangements."

One of their most superstitious practices consists in worshipping or deifying the waters of the Ganges. This large and beautiful river extends from west to east across an extensive district in Hindostan Proper, and with its tributaries may be reached by a very large proportion of inhabitants in the most populous and productive part of India. The sacred ceremony of adoring the Ganges consists in the population crowding morning and evening to bathe in it, and quantities of the water are carried to all parts of India, and are sworn by in courts of justice. "At Allahabad (continues the above entertaining writer), where the streams of the Ganges and Jumna unite, the country for many miles round is considered sacred ground; and so great is the number of pilgrims who resort thither for bathing, that the vizier has received in one year half a lac of rupees for permission to enjoy the benefit of immersion in the sacred flood. Many are the lives sacrificed here annually. The persons who thus fall victims to their superstition are generally females, who come from all parts of the country to perform the tragic deed, and who show a firmness of purpose worthy a better cause. Several of them, accompanied by the priests, embark in a boat, and proceed to the spot where the streams unite, when each of the victims in succession descends from the boat to the river, with a large earthen pan fastened to her body, and is supported by a priest till she has filled the pan with water from the stream, when the priest lets go his hold, and she sinks to rise no more, amidst the applauses of the spectators, while the Brahmins enjoy the scene, and extol the fortitude of the last victim to her who is about to follow."

The cow is an animal held sacred among the Hindoos, and cow-dung is used in the temples and other places as a species of holy ointment. The lotus, a plant with tall luxuriant leaves, is likewise held in deep vene-

ration. Some of the temples or pagodas of the Hindoos are of high antiquity and gigantic conception, majestic appearance, and tasteful architecture. The entrance is always made in a huge pyramid, in a number of stories, which gradually grow narrower as they approach the top. Inside may be seen the cow lying down, a serpent, or some other object of adoration. Here sacrifices take place. One of the most extensive pagodas of India is that of Juggernaut, whose towers are seen at twenty miles' distance. Here, as at other places, there are processions of idol cars, large heavy ornamented structures, which are dragged along by the multitude amid the shouts of assembled thousands. As the wheels pass swiftly on, self-devoted victims rush forward, throw themselves before them, and are crushed to death, exulting in the hope of thus securing a passage to the celestial abodes. The practice of widows sacrificing themselves on the funeral pile of their husbands, is another horrid rite; but it has been suppressed in recent times by the British government.

Besides Brahminism, there are a variety of religious beliefs and sects in India, but all less or more founded on the most gross superstitions. Each possesses its own temples, images, and orders of priesthood. The Boodhists, previous to their violent expulsion by the Hindoos, were second in point of numbers; but their religion is now little known in India, and is confined chiefly to Thibet, Birmah, Siam, and Ceylon.

INDIAN LANGUAGES.

There are, it is believed, four original languages in India, and of these there are some hundreds of dialects, differing less or more from each other, and from the originals, and maintaining also a partial distinction, from the introduction of Arabic, Persic, and other foreign words. While, however, each tribe has its own peculiar dialect, all use one language, the Sanscrit, in their sacred writings. The Sanscrit is a dead language, though probably once spoken; it is wonderfully perfect in its construction, and extremely copious. Its alphabet is called *Devanagari*, divine alphabet, because it is said to have had its origin from the gods, whose language it is; it consists of fifty letters, and has three genders. The next language in estimation is the Pracrit, which comprehends the various dialects used in common writing and social intercourse. The dialects of the Pracrit are spoken in Bengal, and include that which is called Hindostanee, the principal spoken tongue in India.

MOHAMMEDANS AND OTHER CLASSES.

According to Mr. Hamilton, "the modern Mohammedans may with safety be estimated at one-seventh of the total population; and notwithstanding the subversion of their political predominance by a Christian power, their religion continues to expand. They are no longer, however, the sanguinary zealots who, eight hundred years ago, in the name of God and the prophet, spread desolation and slaughter among the unconverted Pagans. Open violence produced little effect on so patient a people; and although the Mohammedans subsequently lived for centuries intermixed with Hindoos, no radical change was produced in the manners or tenets of the latter; on the contrary, for almost a century past, the Mohammedans have evinced much deference to the prejudices of their Hindoo neighbours, and a strong predilection towards many of their ceremonies." The warlike portion of the Mohammedans having recently been dislodged by the British from the Mahratta courts, where they had found shelter, they have been obliged to seek employment in inferior stations. The Mohammedans of India are more intelligent, and possess greater strength and courage than the Hindoos; but they are also more proud, jealous, revengeful and rapacious, and their fidelity is much less relied on by the British government. In some districts the Mohammedan population is nearly as numerous as that of the Hindoos, and both seem to live in a state of mutual amity.

Besides the Hindoos and Mohammedans, there are various scattered tribes in India, of a very different character from either, and often inhabiting mountainous tracts of country, and called Garrows, Monguls, Tartars, &c. Among the different races is found that of the Parsees or Persians, the ancient worshippers of fire, long since driven from their native country by the persecuting sword of the Arabs. Many of this people are opulent, and they take the lead in the commercial transactions of Bombay, Surat, and other north-western parts. Their general conduct is quiet, orderly, and respectable.

Notwithstanding what has been related of the strictness of the Hindoos regarding modes of living, they seem liable to fall in with European usages. In Calcutta and other large towns, many of the wealthy natives imitate the British in their dress, household furniture, equipages, and style of living, and show a strong desire to mix in their social parties, to which, however, they rarely find access. The English take no pains to conciliate the friendship of the native tribes, however well behaved and intelligent they may be. "Of this foolish, surly, national pride (says Bishop Heber), I see but too many instances daily, and I am convinced it does us much harm in this country. We are not guilty of injustice, or wilful oppression, but we shut out the natives from our society, and a bullying, insolent manner is continually assumed in speaking to them." The exclusiveness of this species of hauteur is perhaps fully more remarkable with respect to that class of persons who have drawn their origin from the intercourse between the English and natives. These Indo-British, as they are called, form a part of the population of Calcutta, and are a very interesting and increasing people. "Many of them, (says Statham) are very opulent, and others can vie with the more cultivated of their European neighbours in literary attainments; notwithstanding this, there is a marked contempt shown them by Europeans generally. If a European lady should wed with an Indo-Briton, the doors of all the higher circles would be closed against her, however rich the man of her choice might be." This state of things will happily be modified by the provisions of the act of Parliament already narrated.

RURAL CHARACTERISTICS AND PRODUCTS.

In the large and fertile territory of Bengal, as well as in all other parts of India where the cultivation of the soil is pursued, the art of the husbandman is, as may be expected, still in the rudest state; and in every quarter there exists great room for improvement, which nothing could so well facilitate as the settlement of intelligent European families. In the inundated districts of Bengal, rice is the main crop which is raised, at least during the wet season: it grows to its greatest height while the lands are overflowed, and is frequently reaped by men in canoes, the ear only being cut off, and the stalk left. When the peasants go to market during the height of the flood, they take their families with them, lest the house should be washed off during their absence with the boats. Rice is the summer crop, requiring much heat and moisture; but during the cool dry season, from November to April, they sow and reap another harvest, consisting of wheat, barley, or different kinds of pulse: this is called the *dry crop*, because it is reared without flooding the lands; the rice being considered as the *wet crop*, for a contrary reason. There are, therefore, two seed times and two harvests in this rich country. Besides these regular crops, many small grains are sown, which are limited to no particular sea-

son of the year, and which reward the industry of the Indian cultivator with a rich vegetation at all times.

Besides the different kinds of grain, the farmers of Bengal raise a number of other products, of great value. Of these, one of the principal is indigo; this is a small plant, shrubby in its growth, but in its leaves and flowers very much like the common tares of this country; it is sown during the rains, and raised in rows or drills. The leaves only are useful, on which account it is cut repeatedly, without being allowed to flower, which would make it drier and less juicy. The leaves are steeped and beaten in a vat among water; after which the liquid is strained through cloths, and set to evaporate in shallow troughs placed in the shade. This is soon effected in that warm, dry climate; and the indigo is then found deposited in a crust at the bottom. The process requires much preparation and expense; and it has only succeeded well since the country has enjoyed peace, and there has been a prospect of employing large capitals with security. It now produces, however, a large return to the cultivators; and gives a new source of wealth to the country. It is cultivated along the whole course of the Ganges up to Delhi, and is an annual in the lower, but a triennial in the upper provinces. It succeeds best on overflowed grounds, and in dry seasons is apt to fail. The number of factories of indigo in the Bengal presidency is estimated at 300 or 400. A few of them belong to natives: but they are chiefly in the hands of Englishmen, who take leases of ten or twenty thousand acres of land in the name of native servants (not being allowed to hold it in their own) from a zemindar, for the purpose. They encourage the ryots (native cultivators) to raise crops of the plant, by making advances to them in money. They purchase the produce at a price agreed on, and erect works for extracting the dye from the plant; the whole of the operations being generally conducted by native labourers, under native superintendants. It is observed that the establishment of such factories raises the value of land, extends cultivation, and spreads a certain degree of improvement in the villages. The importation of Bengal indigo into Britain began about forty years ago, and has since increased to an amazing extent. Mr. Crawfurd calculates that about 9,000,000 lbs. are annually exported from Calcutta, of which 7,000,000 lbs. come to Britain, and the rest goes to America, France, Germany, Sweden, &c. About £1,680,000, he thinks, are expended for rent and labour in its production, and it realizes in Europe a sum of £3,600,000. In the countries named, Bengal indigo is silently obtaining a preference over every other.

Silk is raised in great quantities in Bengal and Orissa, between the latitudes of 22° and 26°, and it has hitherto been very nearly a monopoly in the hands of the Company. It is chiefly produced by the native Indian worm, which affords four crops, or sometimes six in the year: the Italian worm, which was introduced half a century ago, yields only one crop a year, but of a finer quality. The Indian silk, compared with the best European varieties, is "foul, uneven, and wants staple;" but its cheapness has brought it into extensive consumption. The Company have eleven factories, or "filatures," which form the centres of "circles," within which the cultivation of silk is carried on, each having a certain number of subordinate stations. The silk, in the raw state, is purchased from the ryots at the factories or subfactories, wound off the cocoons, and prepared for transmission to Europe. About 1,800,000 lbs. are annually brought to England, of which a very small quantity (one per cent.) is equal to the finest silk; the mass of it is decidedly inferior. There is a strong ground to conclude that, under the new act, the production of silk in India will be greatly increased, and its price in Great Britain lowered.

Cotton has long been cultivated by the natives in all the three presidencies. It is universally of the kind called "short staple," and being coarse in quality, and badly cleaned, it fetches only two-thirds of the price of American short staple in the British market. The best quality comes from Bombay (the Guzerat); the next from Madras; and the worst from Bengal. The cultivation being entirely in the hands of the natives, is rudely conducted; and, in particular, pains are not taken to renew the plant constantly from the seed, as the Americans do with the most advantageous results. Experiments have been made under the sanction of the Company, and by private individuals, to introduce and cultivate finer species than those in use, but they have generally been failures. There is no doubt, however, that by the introduction of European capital and skill, the quality of Indian cotton may be much improved, and what is raised sent to the market in a much cleaner and better condition. The exports of cotton from India to all countries amounted in 1827, to 68,000,000 lbs., of which only a third part came to Great Britain.

The cultivation of the sugar-cane is pursued with great success in Bengal and other parts of India, but chiefly by the natives, for domestic use. The process of bruising the canes is on a rude plan, and the sugar which is produced is from this or some other cause very inferior to the sugar of the West Indies. In no article of produce is there greater room for improvement than in this. The cultivation of the cane requires great care and skill, and the mechanism for extracting and preparing the sugar can only be erected at a great outlay of capital. It is anticipated that when Europeans are permitted to hold lands freely, and to embark capital on sugar plantations, sugar of good quality may be manufactured much cheaper than in the West Indies, where the price of labour is much higher.

The bamboo, a species of cane or reed, is much cultivated in Bengal. It grows to the amazing height of forty feet; and though it arrives at perfection in two years, it has all the firmness of the hardest timber. It has joints like a reed, or like grass, and is, like them, quite hollow; yet it is so strong that the porters of the country use it for suspending the heaviest burdens between their shoulders. It is used for beams and uprights in building houses; and being protected from damp by a kind of natural varnish, it will last, in such situations for a hundred years. It serves also for making bridges, for the masts of small boats, and for innumerable other purposes; yet of this useful material, one acre of land will yield ten times as much as the same space will produce of other wood. None of the productions of India puts so many conveniences, in regard to furniture, houses, boats, &c., within reach of the poorer classes, as the bamboo. It would require a large space to mention even the names of the plants useful to man, which flourish in the luxuriant soil of Bengal. Cotton, tobacco, the opium poppy, rape (which is cultivated for the sake of its oil), cucumbers, vegetable marrow (as one of the gourd tribe is called), and innumerable other plants, always afford a plentiful harvest. Of fruit-trees, there are the mango, which is something like our peach, the date-tree, the vassia, the guava, the pomegranate, and others. Another production, which is peculiar to warm climates, and which grows in high perfection along the sea-coasts, is the cocoa-palm. This tree would of itself be almost sufficient for the subsistence of mankind in the countries where it grows, so various and useful are its products; indeed, there are some populous islands—the Maldives and Laccadives—on the coast of India, where little else is cultivated.

In the interior of India, the tea-plant is said to flourish, and is likely to become of great importance to the trade of the country. Districts lying between the 26th and 28th degrees of north latitude, and the 94th and 96th degrees of east longitude, are described as possess

ing this shrub in abundance, and of a quality equal to that of China. In Assam, which lies between Bengal and Thibet, the attempt has lately been made to cultivate and gather the product of the tea-plant for purposes of commerce. In 1838, ninety chests of it were imported into London, and found to be of a good quality. Persons skilled in the gathering and preparation of the leaves have been introduced from China; and there seems little reason to doubt that Assam is capable of producing tea to any extent, if sufficient capital and enterprise were exerted in the undertaking.

ANIMALS.—CLIMATE.

India possesses a variety of animals, both quadrupeds and birds, which are found in no other region. Among the quadrupeds, the most conspicuous is the elephant, which affords amusement in the hunting, and which is of great service, when tamed, in carrying persons on its back, in an ornamental and commodious seat fitted up for the purpose. The tiger is found in the low marshy regions, or jungles, and is also made the object of hunting; but this ferocious animal is now becoming of rare appearance, except in the remote parts of the country. India abounds in monkeys, and has some peculiar races of dogs. When English-bred dogs are taken to the country, they speedily degenerate. In the forests, deer of different kinds, and a race of antelopes, prevail. There are also various descriptions of oxen, among which is the white or sacred bull and cow. There are many splendid specimens of birds, as shining creepers, the ring-necked paroquet, lories, cockatoos, parrots, and other highly coloured feathered animals. There are likewise vultures, bustards, peacocks, and nearly all the game birds and poultry of Britain. India and its islands possess many dangerous reptiles, as crocodiles, lizards, and poisonous serpents or snakes, all of which are more or less found about rivers and marshes, and render bathing in the waters by no means safe. India has also many remarkable insect tribes, one of which, the kermes, produces a fine scarlet dye. Fish, of an immense number of varieties, abound in all the streams and waters, and are frequently of exceeding brilliancy in colour.

The climate of India, though in some high districts salubrious and pleasant, is, on the whole, ill suited to the constitutions of Europeans. There are three seasons—the rainy, cold, and hot: the rainy in general extends from June till October; the cold from November till February; the hot from March till May. During the rains the climate is unhealthy. The temperature of the atmosphere ranges during the hot months from 72° to 105°. At Calcutta, the temperature varies throughout the year, from 69° to 89°, but is more commonly about 82° At Bombay, the temperature is generally somewhat higher; and at Madras it is higher still, the Carnatic being a dry and hot region. This general hotness of India, and the insalubrious character of the rainy season, produces not only discomfort, but renders Europeans liable to fevers, diseases of the liver, and other complaints not common in England. To accommodate invalids, the East India Company have fitted up sanatory stations at certain parts of the country, on the higher grounds, where the air is cool and agreeable; but these places cannot always be depended on by the enfeebled functionaries of the Company, and visits to England are often necessary for the preservation of life. In consequence of the heat of the climate, Europeans amply provide themselves with light cotton garments, which are universally worn as undress.

CHIEF CITIES.

Calcutta, the British capital of India, is situated about 100 miles from the sea, on the east bank of the Hooghley, a branch of the Ganges, in latitude 22° 23′ north, longitude 88° 28′ east. The length of the town is about six miles along the bank of the river. When seen from the south, on which side it is built round two sides of a great open plain, with the Ganges on the west, it presents the view of a very noble city, with tall and stately houses ornamented with Grecian pillars and spacious verandas. The esplanade between the town and Fort William leaves a grand opening, along the border of which is placed the new and splendid government house, erected by the Marquis Wellesley. Fort William, which was commenced by Lord Clive, is the largest and strongest fortress in India, but is considered too extensive to be easily defended: its garrison usually consists of European regiments, with artillery, besides a supply of native troops. The public buildings of Calcutta, besides the government house, are a town-hall, a court of justice, two churches of the established religion, and one for the Scotch presbyterian worship, which is a very handsome edifice. There are also several chapels for other religious bodies, mosques, and pagodas—the latter generally decayed and ruinous, the religion of the people being chiefly conspicuous in their worship of the Ganges. Behind the elegant front lines of houses is ranged the native town, deep, black, and dingy, with various crooked streets, huts of earth baked in the sun, or of twisted bamboos, interspersed here and there with ruinous brick bazaars, pools of dirty water, cocoa-trees, and little gardens, with some fine large dirty houses, the residences of wealthy natives. "Fill up this outline," says Bishop Heber, in his valuable Correspondence, "with a crowd of people in the street, beyond any thing to be seen even in London, some dressed in tawdry silks and brocades, more in white cotton garments, and most of all black and naked, except a scanty covering round the waist, besides figures of religious mendicants with no clothing but their long hair and beards in elf-locks, their faces painted white or yellow, their heads in one ghastly lean hand, and the other stretched out like a bird's claw to receive donations; marriage processions, with the bride in a covered chair, and the bridegroom on horseback, so swathed round with garlands as hardly to be seen; tradesmen sitting on the ground in the midst of their different commodities, and old men, lookers on, perched naked as monkeys on the flat roofs of the houses; carts drawn by oxen, and driven by wild-looking men with thick sticks, so unmercifully used as to undeceive perfectly all our notions of Brahminical humanity; attendants with silver maces, pressing through the crowd before the carriage of some great man or other; no women seen except of the lowest class, and even these with heavy silver ornaments on their dusky arms and ancles; while coaches, covered up close with red cloth, are seen conveying the inmates of the neighbouring seraglios to take what is called 'the air,' a constant creaking of cart-wheels, which are never greased in India, a constant clamour of voices, and an almost constant thumping and jingling of drums, cymbals, &c. in honour of their deities; and add to all this, a villanous smell of garlic, rancid cocoa-nut oil, sour batter, and stagnant ditches, and you will understand the sounds, sights, and smells of what is called the 'Black Town' of Calcutta. The singularity of this spectacle is best and least offensively enjoyed on a noble quay which lord Hastings built along the shore of the river, where the vessels of all forms and sizes, Arab, Indian, Malay, American, English—the crowds of Brahmins and other Hindoos washing and saying their prayers—the lighted tapers, which, towards sunset, they throw in, and the broad bright stream which sweeps by them, guiltless of their impiety and unconscious of their homage—offer a scene such as no European and few Asiatic cities can at all parallel in interest and singularity."

In recent times, considerable improvements have been made in and about Calcutta, jungles being cleared away, streets drained, and stagnant water removed. The

the situation of Calcutta has not been well chosen, it is excellently adapted for commerce. At high water the river is here full a mile in breadth. The advantages possessed for inland navigation are considerable; foreign imports may be transported with great facility, on the Ganges and its tributaries, to the north-western quarters of Hindostan, while the valuable productions of the interior are received by the same channels. There is at all times a vast quantity of merchandise deposited at Calcutta, and the trade carried on is now very extensive. Besides a government bank, there are three private banks which circulate to a considerable amount. There are several daily, twice-a-week, and weekly newspapers published. The religious, and charitable, and educational institutions, are numerous and of great service. Society in Calcutta is gay and splendid; and the British inhabitants among their own class are described as hospitable, though jealous of etiquette, and of an overbearing disposition. There are no hotels, or inns, or lodging-houses of any description—a want which appears perfectly amazing—and all strangers, male or female, must be provided with introductions to the houses of residents. The expenses of living are very considerable: and as there are now no more opportunities of acquiring wealth by the spoliation of native principalities, fortunes are much seldomer realized than formerly. There being also now fewer deaths, there are fewer chances of promotion. According to Mr. Hamilton, "Without being attached to some department of service, or trained up to some mechanical trade, there is little hope of prosperity to a young man migrating on chance from Europe. Here all the inferior situations of clerks, overseers, &c., are necessarily occupied by the natives; and it is by these gradations in Europe that young men rise to opulence in the commercial world." The population of Calcutta is composed of about 14,000 Christians, 48,000 Mohammedans, and 120,000 Hindoos; but this is the amount only within the city proper. If the environs or suburbs be included, the population will amount to perhaps 500,000; and so densely peopled is the surrounding district, that within the circuit of twenty miles there is a population of nearly two and a half millions.

Serampore, a Danish settlement, about twelve miles above Calcutta, is the head-quarters of the missionaries sent from Europe, and here a printing-press has been established, and from which Bibles in a great variety of languages have been issued. The missionaries also here conduct a college for the education of native Christians, Hindoos, or Mohammedans. The enterprise and judicious exertions of the missionary body at this place cannot be sufficiently commended.

Madras, the seat of government of Southern India, is situated in the Carnatic, on the shore of the Bay of Bengal, in latitude 13° 5′ north, longitude 80° 21′ east. The shore is here low, and dangerous to approach by vessels. On the beach stands Fort St. George, a place of considerable strength, and which may be easily defended by a small garrison. A noble range of public edifices including a custom-house and court-house, also adorn what is called the north beach. Madras differs in appearance from Calcutta. It has properly no European town, the settlers residing in their houses in the midst of gardens, and transacting business in the district appropriated to the residence of the natives. The principal church in Madras, St. George's, is a beautiful edifice. There are many excellent charities here; and the school for male and female orphans, into which the philanthropic Dr. Bell introduced the Lancasterian system of education, is superior to any thing of the kind in Calcutta. The society of Madras is more limited than that of Calcutta, but the style of living is similar. The roads in the vicinity are excellent, and afford most agreeable drives to the European residents. According to Heber, "the native Christians are numerous and increasing, but are, unfortunately, a good deal divided about castes." The Armenians are here numerous, and some of them wealthy. A Scotch Presbyterian church is now erected The population of Madras and its suburbs has been stated at upwards of 400,000.

Bombay, the seat of government for the western parts of India, is a small rocky island, lying on the west coast of Hindostan, in latitude 18° 56′ north, longitude 72° 57′ east. Bombay was originally some hilly, rocky islets, but these, by the influence of the high tides, have been joined to each other; and now the island is composed principally of two unequal ranges of whinstone rocks, extending from five to eight miles in length, and at the distance of about three miles from each other. All the ground that can be cultivated is now laid out in agriculture, and the remainder is either barren or covered with the residences of Europeans and natives. These residences are on wet, low, and unhealthy grounds, ever below high-water mark; and from this and other circumstances, Bombay is described as being the most insalubrious of the presidencies. The fort of Bombay is situated at the south-eastern extremity of the island, on a narrow neck of land. The chief advantage of Bombay is its deep tide water, which permits the most extensive system of maritime trade: excellent docks are erected for the accommodation of the shipping. Bombay is the seat of very extensive trade with the Persian Gulf on the north, as well as with the south of India. Cotton is the principal article of export. The population is stated at about 160,000, composed of Christians, Jews, Mohammedans, Hindoos, and Parsees.

Delhi, once the capital of the Mogul empire, is situated in 28° 41′ north, in the province to which it gives its name, and at the distance of 976 miles from Calcutta. This once magnificent city is said to have, in former times, covered a space of twenty square miles; in the present day an immense number of its ancient streets, houses, temples, and other edifices, are in ruins, and the modern town, removed at some distance from the old, occupies a space of seven miles in circumference. It is seated on a range of rocky hills, and is surrounded by walls, recently improved and strengthened by the British. The city contains many large and good houses, mostly built of brick. There are a great number of mosques, with high minarets, and gilded domes, and above all are seen the palace of the emperors, a very high and extensive cluster of Gothic towers and battlements, and the Jumna Musjeed, the largest and handsomest place of Mohammedan worship in Hindostan. The chief material of these public buildings is red granite, of an agreeable colour, inlaid in some of the ornamental parts with white marble. One of the principal characteristics of Delhi is thus described by Bishop Heber:—"We passed, in our way to the Agra gate, along a very broad but irregular street, with a channel of water, cased with stone, conducted along its middle. This is a part of the celebrated aqueduct, constructed, in the first instance, by Ali Merdan Khân, a Persian nobleman in the service of the Emperor Shahjehan, then long neglected during the troubles of India and the decay of the Mogul power, and within these few years repaired by the English government. It is conducted from the Jumna, immediately on leaving its mountains, and while its stream is yet pure and wholesome, for a distance of about 120 miles; and is a noble work, giving fertility to a very large extent of country near its banks, and absolutely the sole source of vegetation to the gardens of Delhi, besides furnishing its inhabitants with almost the only drinkable water within their reach."

The British resident at Delhi exercises a most extensive authority, from his having the exclusive charge of the emperor and his family, his taking cognisance of all political events in the north-west of Ind a, and his super

mtendence of many ex-kings and chiefs. The office is therefore always filled by one of the ablest and most experienced of the public functionaries of the Company. The population of Delhi is now computed not to exceed 200,000.

Agra, the capital of the province of the same name, is commodiously situated on the south-west side of the river Jumna, in latitude 27° 11′ north. The greater part of this once flourishing city is now in ruins. In the habitable part, the houses are several stories in height, and the streets remarkably narrow. There is a large and ancient fort, surrounded with high walls and towers of red stone, which commands some noble views of the city and its environs. The principal sights, according to Heber, are the Mootee Musjeet, a beautiful mosque of white marble, carved with exquisite simplicity and elegance; and the palace built by Akbar, in a great degree of the same material, and containing some noble rooms, now sadly disfigured and destroyed by neglect. Agra has been in some measure renovated by the British; and when made the seat of a presidency, will most likely be still further improved.

Benares is an ancient and highly venerated city in Hindostan situated in latitude 25° 30′ north, on an elevated piece of ground on the banks of the Ganges, about half-way between Agra and Calcutta. The streets of this holy city are extremely narrow, and the houses, which rise to the height of six stories, are in some cases united by galleries. The number of stone and brick houses from one to six stories high exceeds 12,000, and the mud houses are about 16,000, besides garden houses. The number of inhabitants is estimated at upwards of 600,000, exclusive of a large body of temporary residents, who come hither for religious purposes from all parts of India. Benares may be called the university town of the Hindoos, as their laws and religion are here taught by Brahmins and learned men in various establishments for the purpose. It is also reckoned to be a place of extraordinary sanctity; and to die at Benares is the greatest happiness of a Hindoo, because he is then sure of immediate admission into heaven. The town is distinguished by a magnificent temple dedicated to Siva. From its great antiquity, relics of former greatness, and religious character, Benares may be considered the most interesting city of India.

PORTUGUESE SETTLEMENTS.

The possessions of the Portuguese in India are now confined to Goa, and a small territory round it; Damaun, a sea-port in the province of Guzerat; Diu, a small island near the southern extremity of the Guzerat peninsula; Dhelli, on the island of Timor; also Macao, in China; and establishments on Sumbhawa, Floris, and some others on the Eastern Isles. Goa is the only place here worthy of notice. It is situated on the west coast of India, in the province of Bejapoor, in latitude 15° 30′ north, 250 miles south-east of Bombay. During the period of Portuguese dominion in India, this was their splendid and populous capital, the head-quarters of their tyranny, the seat of their inquisition. It is now a wilderness, of which the monasteries form the only tenanted portion, and a few miserable monks, half of them natives, are the only inhabitants. "Indeed (says Mr. Hamilton) the city may be traversed from one extremity to the other without meeting a human being, or any other signs of former population than pavements overgrown with grass, gardens and court-yards choked with underwood, and princely dwellings and venerable abbeys mouldering rapidly to decay." There are still several churches in preservation, also the building once occupied by the inquisition, which has been shut up for many years. Panjim, or New Goa, is situated five miles nearer the entrance to the harbour of Goa, and is now the seat of the Portuguese authorities, and of the business carried on. The territory in th neighbourhood of Goa, forty miles in length, by twenty in breadth, forms the possession of the Portuguese; and it was estimated, in 1808, that within this tract there were two hundred churches and chapels, and above two thousand priests.

INDIAN ISLANDS.

The islands usually considered to belong to India, both from proximity and similarity of social condition, are Ceylon, Sumatra, Java, and Borneo, with the Moluccas and a great number of smaller size. Ceylon, lying between 5° 50′ and 9° 50′ north latitude, and near the southern promontory of India, extends to 270 miles in length by about 100 in breadth. The island is generally mountainous, and possesses an agreeable climate, considering its short distance from the equinoctial line. The rivers and rills are numerous. Rice, coffee, cocoa-nuts, with cinnamon and various other spices, form the staple produce; the sugar-cane has also been cultivated of late years. The country possesses various tribes of wild animals, and among others the elephant, which is an object of sport to British and native residents. The population is now believed to amount to 1,400,000. Candy is the capital. Once a possession of the Dutch, Ceylon is now a free crown colony of Great Britain, and open to British settlers. By improvements in roads, agriculture, education, trade, &c., it is in a state of considerable advancement from barbarism, and will ultimately prove a most valuable colony.

Sumatra is an island lying immediately under the line, extending to 1000 miles in length by 165 in breadth: at a short distance on the north is the peninsula of Malacca. The population are a branch of the Malay race, and are in a backward condition, under native chiefs. At Bencoolen, the Dutch are established, and derive advantage from the export of coffee, spices, &c. The straits of Sunda, on the south, separate Sumatra from *Java*. Java extends 642 miles in length by about 100 in breadth, and is an island of extraordinary fertility and luxuriance. It possesses many fine palm and cocoa-nut trees, and its fruits of all kinds are abundant. The chief produce for export consists of rice, sugar, pepper, coffee, and tobacco. The greater part of the island is a possession of the Dutch, whose capital is Batavia; native chiefs claim the sovereignty of the remaining part. *Borneo*, lying under the line, is one of the largest islands in the world; it extends about 800 miles long by about 700 in breadth. The Dutch have formed settlements upon it; but the greater part is in a primitive barbarous condition, and unexplored by Europeans. In Borneo is found the pongo, the largest of the monkey tribe. Of the Moluccas, the Philippines, and other scattered groups of islands in this quarter of the world, little is satisfactorily known: all are inhabited by a savage Malay race, and there is no present prospect of their improvement, notwithstanding their fine climate and great productive powers.

MISCELLANEOUS PARTICULARS.

The preceding brief sketches can convey but a feeble idea of the immense extent and varied character of the Indian empire, as well as of its vast capabilities and importance as a possession of Britain. In India, the European traveller is everywhere charmed with the wild grandeur of the scenery and the luxuriance of the soil; and he is equally surprised at the density of the population, and the traces of superstitious observance which meet his eye. The people for the most part live in an exceedingly simple manner. Much of their food requires no cooking; plantains, cocoa-nuts, pumpkins, and other fruits, being more palatable raw than dressed. The chief cooked article is rice. Houses are made of bamboo or cajann stakes, without splitting, planing, or

dressing of any kind; they are then woven together with small twigs equally unprepared; the whole is plastered over with mud from the nearest clay-hole, and then thatched with cocoa-nut leaves fresh from the tree. Oars for their boats are only bamboos, with a round board tied to the end; the masts are two or three of the same bamboos lashed together with strings. Drinking cups are made of a large nutshell, with one end rubbed off on a stone; a most palatable and wholesome drink is found in the juice of the cocoa-nut palm, which is received into an earthen jar as it drops from the point of a broken branch; and its only preparation is straining through a kind of natural sieve, which is found at the roots of every leaf on the tree. The common people wear little or no clothing; and when it comes to rain, their only umbrella is formed of a number of palm-tree leaves sewed together by the edges into a shape resembling a cradle cut across, which covers their head and back. All processes of manufacture and handicraft are on the rudest possible scale, and carried on without what we term capital. The people only scratch the ground instead of ploughing it; they never apply any manure; their corn is thrashed by setting bullocks to tread upon it; the smith's anvil is the nearest stone, his bellows a rough goat-skin; a shoemaker tans the raw hide one day, and makes shoes of it the next, sitting the whole time at the door of his customer; the weaver's apparatus needs but the shadow of a tree for shelter—and it can be removed at an hour's notice to any other tree which is more convenient. Even their distillery needs only an earthen kettle, some cold water, and a few bamboo reeds for a worm; and with these they produce liquors as intoxicating and pernicious as any manufactured by the science of Europe. This absence of skill in all the processes of industry, renders the labour of the working man of very slight value: hence, he never receives more than what is barely necessary for subsistence; and the whole mass of the people are consequently at the lowest ebb in regard to domestic accommodations or mental acquirements. Their celebrated countryman, Rammohun Roy, who died lately in this country, believed that many of them did not know whether the British or the Mohammedans were masters of India.

Simple as the bulk of the population is, there are not wanting scattered tribes and families dexterous both in cunning and crime. Skill in jugglery, or sleight of hand, has been carried to a pitch never elsewhere equalled, and the tricks performed are so wonderful as to confound the sagacity of the most acute Europeans. Tranquillized as the country is in its civil affairs, there is still a great want of police or effective local jurisdiction. In the accounts of all travellers, it is mentioned that there is no possibility of travelling in almost any part of the interior in safety without a guard and retinue of servants. The roads, if they can be called such, are hardly discernible tracks, quite unfitted for wheel-carriages, and travellers must therefore ride on horseback, or on the backs of elephants, or be carried in palanquins—a species of litter supported on men's shoulders. There being also no inns in India, each traveller is obliged to carry tents and provisions for daily use.

In the states of Bhopaul, Oude, Gwalior, and Bundelcund, and the Company's possessions in the Doab, as well as in some other quarters, there exist hordes of wretches, called Thugs, who infest the roads, and carry on a methodic system of murder, for the sake of plunder. They kill by strangling their unhappy victims. The Thugs form a peculiar race, and practise their murders, as is alleged, from a religious principle; at all events, they attach no idea of criminality to the offence. They have practised the trade for centuries, and are with difficulty restrained within bounds by the European forces.

Slavery prevails in Bengal and some other parts of India, but neither to a great extent nor on a severe principle. The slaves are mostly used in domestic labour, and are generally treated with kindness, both by Hindoos and Mohammedans. Although the British government does not countenance slavery, it would be found almost impossible to extirpate it, either by law or admonition, for it originates in the sale of children by parents during famines, or under circumstances of peculiar calamity. Such is sometimes the distress of the parents, that they will dispose of their offspring for the merest trifle, not from want of affection, but most likely with a view to the saving of their lives. Selling children into slavery, therefore, prevents infanticide, or what is as bad, death by starvation; and so long as no fund exists to relieve the famishing natives during times of exigency, it does not seem possible to prevent the disposal of children by their parents, especially since the laws of the Hindoos permit the practice. We may, however, naturally expect that, with the advance of civilization and habits of carefulness, slavery will here, as elsewhere, cease. At present, slaves in India are frequently liberated by their owners from motives of piety.

Independently of the efforts of the Bishop of India and the religious establishment with which he is connected, the Church of Scotland and other bodies of Christians have for some years been putting forth their exertions to attempt the conversion of the native pagan races, and consequently to elevate their condition. But on the whole, very little success has crowned their well-meant labours; the loss of caste, which inevitably follows the abandonment of the Hindoo faith, may be stated as a barrier to conversion which no power of persuasion can remove; in short, it has been proved beyond the possibility of doubt, that to Christianize India, the people must in the first place be instructed in secular knowledge. Aware of this fact, attention is beginning to be directed to the education of the young. Fortunately, the general population throughout Bengal and Bahar, where investigations have been made, are zealously anxious for instruction in useful knowledge, as well as to learn the English language; and there is a prospect of a plan of education being carried into effect, on the basis of native schools already in existence.

From all that we can learn, it would appear that the present rude state of learning among the native population is a degeneracy from something of a lofty character in ancient times. It seems beyond a doubt, that, some thousands of years ago, there was as enlightened a race of inhabitants in Hindostan as there was about the same period in Egypt. Certain remains of art are on a truly gigantic and splendid scale. The most celebrated are the temples of Ellora, a town near Arungabad, 260 miles from Bombay. They are said to extend over a circuit of three leagues, and consist of stupendous edifices sculptured in the solid rock, like the most exact and beautiful architecture. They are generally about 100 feet high, 145 feet long, and 62 feet wide; and contain thousands of sculptured figures, including sphinxes and other objects similar to those now seen among the ruins of Egypt. The history of these now deserted temple is entirely lost, and imagination wanders in quest of their remote and mysterious origin.

Turning from such matters to others more intimately connected with the modern condition of affairs, it is gratifying to anticipate that British capital and skill will speedily be directed in India to the cultivation of sugar, coffee, tobacco, and particularly cotton, all which products, from the extraordinary cheapness of labour, may be increased to an incalculable extent, and with the most enlivening prospect of profit. Hitherto the system of jurisprudence established by the Company has been a vain mixture of Hindoo, Mohammedan, and English law, and by no means well calculated to preserve public tranquillity. Should the government proceed to modify and extend the system of administering the laws, at the

same time relaxing the burden of taxation on land, and endeavouring to conciliate the natives by promoting those worthy of trust, much good might be anticipated. By these and other measures, suited to the genius of the people, a solid basis would be afforded for the investment of capital, and India would gradually improve both in its moral and physical condition.

Until within the last few years, the intercourse with India was carried on by means of vessels belonging to the East India Company or private traders, which made the passage in about five months by the Atlantic and Cape of Good Hope. This most tedious route is still pursued by trading vessels; but the more expeditious route by the Mediterranean, Egypt, and Red Sea, to Bombay, with concurrence of Mehemet Ali, is adopted for mail conveyance and passengers who desire a quick transit. The line pursued is London to Paris; Paris to Lyons and Marseilles; thence by steamboat, touching at Leghorn and Naples, to Malta; and by another steamer from Malta to Alexandria; from Alexandria by canal to the Nile, and onwards by boat to Cairo; thence by a land journey to Suez; down the Red Sea from Suez to Bombay, touching at Mocha—total length of time from London to Bombay, sixty-one days. The expense of a single traveller is stated at £153, 19s. 0d.

The circulating medium of India consists of gold and silver coins, paper-money, and cowries. The most common silver currency is the new coinage of Calcutta. Potdars, or money-changers, are a common class in every town, and sit generally in the open air with heaps of cowries placed before them. Cowries are small shells, which, not being depreciable by imitation, form a good medium for buying and selling among the lower classes. Their value varies in different places. The following is their value in Calcutta:—4 cowries 1 gunda; 20 gundas 1 pon; 32 pons 1 current rupee, or two shillings sterling (2560 cowries); 10 current rupees 1 pound sterling. The sicca rupee is 16 per cent. less in value than the current rupee, which is an imaginary coin. The Bombay rupee is valued at 2s. 3d.; a pagoda is 8s. The British government now supplies a handsome and commodious coinage, the more common silver coin being the rupee, which nearly resembles our half-crown.

An idea of the trade with India may be obtained from the following statements:—The leading articles of export to India from Britain in 1832, were cotton manufactures, valued at £1,531,000; cotton twist yarn, £309,000; woollen manufactures, £237,000; copper wrought and unwrought, £364,000; iron, wrought and unwrought, £144,000; hardware and cutlery, £82,000; wines, £150,000; beer and ale, £87,000; glass, £101,000; stationery, £50,000; books, £27,000; linen manufactures, £49,000; jewellery, £33,000; silk manufactures, £125,000; apparel, £32,000. Each of the other articles is under £30,000. Total value of the articles exported, £3,750,000. In 1838, including those to Ceylon, the total exports were £3,876,196.

The leading articles of import from India in 1832, were—indigo, £1,212,000; raw silk, £1,189,000; cotton wool, £807,000; saltpetre, £413,000; coffee, £284,000; sugar, raw, £209,000; dyed cotton, £136,000; white calicoes and muslins, £49,000; rice, not in husk, £128,000; pepper, £70,000; tortoise-shell, £77,000. Each of the other articles was under £45,000.

The following words are frequently used in reference to India:—

Adawlet, a court of justice.—*Bega*, a land measure amounting in Bengal to about the third of an acre.—*Bungalow*, a dwelling formed of wood, bamboo, mats, and other light materials.—*Chokeydar*, a watchman.—*Choultry*, a place for the accommodation of travellers.—*Circar*, a large division of country.—*Coolies*, labourers, or porters.—*Cos*, a measure of distance not less than a mile, nor more than two miles.—*Crore*, ten millions.—*Dacoits*, robbers.—*Dewan*, a head officer of finance.—*Dewanny*, the privilege of exacting taxes in perpetuity.—*Durbar*, a court of audience.—*Gentoo*, a Portuguese term, signifying a Gentile.—*Ghaut*, a chain of hills, or pass among mountains.—*Howdah*, the seat elevated on the back of an elephant.—*Lac*, one hundred thousand.—*Lascar*, a native sailor.—*Looties*, a plunderer.—*Musnud*, a throne.—*Nabob*, or *Nawaub*, a viceroy governor under the Mogul empire.—*Paddy*, rice in the husk.—*Pagoda*, a word of Europeans for a Hindoo temple.—*Perwana*, a license.—*Pergunnah*, a certain number of villages, or tract of country.—*Peshwa*, a leader.—*Pundit*, a learned Brahmin.—*Raja*, a king or prince.—*Rajpoot*, literally, the offspring of kings, now meaning persons of distinction.—*Soubah*, a district of twenty-two circars.—*Subahdar*, the governor or viceroy of a soubah.—*Tiffin*, a lunch, or mid-day meal.—*Vakeel*, an agent or ambassador

THE PRIVATE DUTIES OF LIFE.

The temporal duties enjoined on rational beings may be thus classed:—1. Duties which one owes to himself.—2. Duties which arise from domestic relations.—3. Duties which arise in the communities of which each one is peculiarly a member.—4. Duties which arise from the political relations of society.—5. Duties which arise between individuals who are of different nations. We propose, in the mean time, to treat of those duties which a rational being may be said to owe to himself, or as they are generally termed, PRIVATE DUTIES.

LIFE AS A WHOLE.

Life is a succession of parts—infancy, youth, manhood, maturity, decline, old age, and death. What man becomes, depends in part on his genealogy: as his infancy is, so will be his youth; as his youth is, so will be his manhood; as his manhood is, so will be his maturity; as maturity is, so will be decline; as decline is, so will be old age. If youth be passed in idleness, ignorance, folly, and crime, how can one hold his way in the world, side by side with the intelligent, the worthy, and the virtuous? If manhood has been passed in low pursuits, in rooting in the heart evil propensities, in wasting natural vigour, what awaits one in old age but poverty, pity, and contempt? If infancy be devoted to the reasonable expansion of the physical and intellectual powers—if knowledge of human duty be acquired, and be rightly used, will not manhood be worthy, maturity respectable, decline honoured, and old age venerable? Life, then, must be taken as one event, made up of many successive ones. On these unquestionable truths we found all that is worthy of any notice in the following pages.

PURPOSES OF LIFE.

We believe that human life, rightly understood and rightly used, is a beneficent gift; and that it can be so understood and used. It is irreconcilable to reason, that man was sent into this world only to suffer and to mourn; it is from his own ignorance, folly, or error, that he does so. He is capable of informing himself; the means of doing this are within his power. If he were truly informed, he would not have to weep over his follies and errors. It is not pretended that every one can escape at once from a benighted condition, and break into the region of reason and good sense. But it is most clear, from what is well known to have happened in the world, that each generation may improve upon its preceding one; and that each individual, in every successive period of time, may better know the true path, from perceiving how others have gone before him. There can be no miracle in this. It will, at best, be a slow progress: and the wisdom arrived at in one age, must command the respect of succeeding ones, and receive from them the melioration which they can contribute. We understand nothing of what is called the perfectibility of human nature; but we understand this, that if human nature can be made to know wherein its greatest good consists, it may be presumed that this good will be sought and obtained. Man was created on this principle, he acts on this principle, although he is seen so frequently to make the most deplorable and distressing mistakes. If it be not admitted that mankind will always strive to obtain whatsoever seems to them good, and strive to avoid whatever seems to them evil, their moral teaching is in vain. If this principle be admitted, the sole inquiry is—what is good? and what is evil?

INFANCY.

Every human being comes into the world with physical and intellectual qualities, propensities, and aptitudes, which distinguish him as much from all other beings, as he differs from them in figure and appearance. As society is a consequence of the Creator's will, as the proper divisions of labour are a necessary consequence of society, it is not irrational to suppose that individuals are born with adaptation to labour in some departments, and not in others. In the early stages of life, these qualities are sometimes developed, whether they happen to be understood or not. But almost immediately after gaining some hold on life, all human beings become subject to the incidents which tend to strengthen original qualities, or to obscure or stop their progress, and even to suppress them, and engraft on the original stock those which are entirely different. It would be unjust to make infancy responsible for the evils and errors which arise in this manner; but certainly those who have the guidance of infancy are responsible, and will be held to be so. Children have a right to complain, and society has a right to complain, if duties to children be neglected; and, it is needless to remark, there is another and inevitable accountability of a far more serious character. We shall have occasion to remark on the very sober duties of those, who, according to the order of natural and necessary law, are intrusted with forming and giving effect to natural qualities. This matter properly belongs to another place.

YOUTH.

We come now to a period when accountability begins in all the relations which were placed in the division of duties. If it be asked at what age this is to be fixed, we answer, that the good sense of judicial law recognises that a child may be a witness in solemn judicial proceedings, when inquiries addressed to him are so answered as to make it certain that he understands the nature and the obligation of an oath. This may be at the age of ten or twelve years. But the perception of right and wrong, and the sense of duty, begin at an earlier age. There certainly are children of the age of eight years who have a very clear sense of moral propriety; and very many who, between that age and twelve, can discern and reason on right and wrong, and arrive at a very sound judgment. We shall presume that all into whose hands this article may fall, will be fully capable of comprehending its purpose, and of judging of its fitness to be useful to them. We must assume, then, that we are speaking to those who are willing to be instructed in serious things, and that they will not reject instruction from any source, however unpretending it may be, if it come to them in a manner which they can reconcile with their own reason, and with their own duty to themselves. Young persons think that they can see for themselves and that they need not to be told what others have seen But let us reduce this to common sense. Suppose a person to be under the necessity of going from the place in which he has lived, and which is familiar to him, to a far distant place. Let it be supposed that the road he must travel is crossed by many roads, and that he is frequently to find himself at points where several roads are seen, either one of which, so far as he can discern, may be the right one. Will it be of use to him to have been told before he departs, which of these many roads

to take? Will it help him onward to his destination, when he is bewildered, and unable to decide for himself, to find some one who can assure him of the right course? Life is a journey. Every step we take in it brings us to something new, something unexpected, and perhaps entirely different from that which was looked for. Those who have gone through it before us, have left us their instructions in what manner it is to be undertaken and accomplished. They tell us of their own troubles and difficulties; they warn us how to avoid the like in our own journey. Which is wisest—to listen to them, and weigh the worth of their warning, or to push on heedlessly, and take the consequences?

HEALTH.

We suppose that every child, of the ages last spoken of, can form some opinion of the value of health. Most of them have suffered, more or less, by that time. They are now old enough to consider the purposes for which life has been given to them. They then feel that the purpose is to be pleased and gratified; to want and to have; and that restraint is disagreeable. But let them remember that life is a whole; that though all of them will not, yet some of them will, attain to its longest duration, and that it is wholly uncertain to whom that lot will fall. Long life may depend, and often does depend on what children do, or omit, at an early age. Among the first gratifications which are looked for at this period, is the indulgence of the appetite for food. Here comes in a rigid law of the Creator. It cannot be broken without consequent suffering, nor repeatedly broken without impairing, and perhaps destroying, the material frame which has been described as so fearfully and wonderfully made. To require of that delicate machinery, on which the action of life depends, that which it is not qualified to do, and which it cannot do—to force it to do that which is offensive to it—and to make this requisition habitually—is a sin against natural law. Its punishments are well known. The restless sleep, the heavy head, the many sensations of uneasiness, the positive pain, the disgusting remedies, are the punishments which follow. They are not all. Nature loses its charms, companions their interest, duties become irksome, the mind hates its labour, penalties are incurred, parents or teachers are regarded with displeasure. These are the fruits of momentary gratification of the appetites. On the other hand, there is a law of nature that food shall be grateful. It is required to supply the daily waste—to continue life. If there were not a craving want, we should take food as a mere necessary duty. It is kindly made to be a pleasure, and, like every other pleasure, it is to be used, and not abused. Thus, by ignorant or wilful pursuit of pleasure, we violate a law which brings with its just punishment not only the loss of the like pleasure for a time to come, but also pain and suffering from indispensable remedies. When children are sick, they are subjects of tenderness and pity; but in most instances they rather deserve to be punished, for they have broken a law wilfully, since they have disregarded their own experience. As to kinds of food, nature is not unreasonably nice about this: that which it complains of is quantity.

CLEANLINESS.

This is not a mere matter of decency. It is one of the positive commands arising from the constituted order of things. Be it remembered, that every thing that lives, vegetable or animal, is wasting while life continues; and that all which is sent forth through the millions of openings by the skin, has run its round, and is lifeless; and that more than half of all the food taken comes forth in this manner. If perspiration, sensible and insensible, be permitted to rest on the skin, and stop the way of that which is coming, nature is offended, and will show that she is so. Such neglect is one of the causes of disease. This fact was probably well known to eastern nations, since it was part of their religious duty to cleanse the skin. These nations were ignorant of the modern comfort of wearing a garment next the skin which can be frequently changed. The absence of this comfort was one of the causes of those dreadful diseases of which we read, and which are now unknown among Christian nations. There are classes of labourers and mechanics, whose health would be preserved, and their lives prolonged, if they knew how much depended on periodical cleansing. It may be said that there is a connection between cleanliness and moral feeling. Perhaps it may be going too far to say, that those who habitually disregard cleanliness, and prefer to be dirty, have no moral perception; but it may be truly said, that those who are morally sensitive are the more so from respecting this virtue. There is a close affinity between moral depravity and physical degradation. The vicious poor are always shockingly filthy: the depraved rich are visited by worse penalties: they may have clean garments; but what can wash away the impurities which vice has made part of themselves? It is not for one's self only that the virtue of cleanliness commends itself. Every one comes within the observation of others. However uncleanly one may be himself, he is not the less offended at the like neglect in those whom he observes. Now, it is every one's duty to himself to recommend himself to others, so far as he innocently and reasonably can, and to obtain their respect. Clean and costly garments may fall very short of doing this, if it be seen that they are a covering for the neglect of this important law. If there be a lovely object to the human eye, it is a clean, clear-faced, healthy, innocent, neatly-clad, happy child. There are few children who may not, if they will, be neatly dressed, for this does not depend on that of which the dress is made. There are fewer who may not have a clear skin, and healthy look, if they are properly fed, and sleep in pure air. There are none who may not have a clean skin; for we speak to those who are old enough to judge for themselves. And let it be added, for their inducement, that, in obeying the command to be clean, they are performing a moral duty; i. neglecting it, they are inflicting an evil on themselves in two ways—first, in diminishing their own comfort; second, in losing the esteem of others.

AIR.

Among the generally unknown causes of loss of health, is the respiration of impure air. The congregation of many persons in one apartment, especially when artificial light, in great quantity, is permitted, is a cause of more maladies than is commonly supposed. Three causes, in such case, combine to destroy the fitness of the air for respiration—the animal heat of the assembly, the lights, and the breathing of the same air again and again. There must be such assemblies. The remedy is proper ventilation. The smoke of lamps has frequently occasioned death. No lamp is properly trimmed if it emit any thing more than a pure bright flame. It is a common practice to keep sleeping apartments shut up. If there be several persons in a small room which has been shut up for several hours, it would be shocking to know how often they must breathe again and again the same air, and how unfit it is to be breathed after it has once visited the lungs. Add to this the impurity of the air, which is continually in contact with the furniture prepared and constantly used for sleeping, in an unaired apartment. It is not mere nicety, or fastidious delicacy, which requires that the pure air should be admitted where the human lungs are in action, but it is a law as old as the creation of man, and cannot be disregarded. A skilful observer might select among many, from the appearance of the countenances, those who have just left

an apartment in which they have been respiring for hours a spoiled atmosphere. No doubt that this cause, long continued, so affects the whole mass of blood as to bring on many diseases. If pure air be peculiarly necessary to any class of persons, it is so to children. We believe a more useful suggestion could not be made on the subject of health to the whole community, than to invite them to respect this law of nature—that there cannot be perfect health where the air is impure, and that this applies especially to apartments appropriated to sleep. Visiting friends are often put into sleeping apartments which have not been opened for days and weeks; this is far enough from kind treatment, however innocently it be done.

TIME.

Every person connects himself, in his usual thoughts of himself, with all the lapse of time in which he can remember, and with all the lapse of time through which he expects to live. This he calls his life. He does not live in time that is past, nor in time that is to come. He actually lives only in the present moment. Yet he feels that he lives in the past, and will live in the time to come, because the past, the present, and the future, are so connected that he cannot separate them. It is, then, a law, prescribed to us, from which no one can free himself, that he shall suffer in the passing moment for the wrongs done in time gone by, and for the evils of which he dreads the approach. As this is certainly so, how little does he regard the operation of inflexible law, who provides for himself a load of self-reproach, for any gratification which he can procure by error or by crime!

Let us lay out of the case those errors and crimes which have been alluded to, and consider negligences and follies. Man was meant for action, and his actions were intended to enable him to secure good to himself. Good to himself depends on the performance of his duties to himself. Duty to himself requires that he should improve his faculties, and should avail himself of all the opportunities given to him for that purpose. The hours, then, which are permitted to slide by without any improvement, are lost. In so losing them, he breaks the law of the Creator. Apply this to the vocations in which one is to cultivate his mind in any business, mechanical, scientific, or learned. When one sees himself surpassed by others, and left far in the rear; when he is called on to measure himself against another; and when he sees that comparisons are made between him and others, greatly to his disadvantage—he may feel, and most men do feel, that they are thus depreciated because the precious time which was allotted to improvement has been passed in trifling amusements or in idle pursuits. To some minds, the suffering from such causes is extremely acute. They have no one to blame but themselves. The bitter remembrance which they have of the past, as connected with the present and the future, is the punishment for breaking a positive law. They may console themselves, perhaps, with the firm resolution, that they will repair the wrong done in the past time by diligence in the time to come; but they find that time brings with it its own demands. They are fortunate, indeed, if they can do in one space that which belongs to it, and that also which belonged to another and in another season of life.

One cannot innocently say his time is his own, and that he may dispose of it as he pleases. His time is his life. It is given to him in trust. Like other trustees, he will be held to an account, in which there is no possibility of concealment, and where nothing will depend on proof. It may be supposed that it will be said to him, There was confided to your use a term of time; you knew, or could know, the laws prescribed to you in performing your trust: are you come from that trust to render an account of it, burdened with reproach from your own conscience, and with marks of guilt which you cannot hide? or, are you come without any advancement in the knowledge of your duties, and with no other account than that your days rolled by in childish pursuits or idle amusement, *no wiser* when you were severed from the world than when you left the cradle of infancy? or, are you come with the exalted acquirements which you might have, and with that innocence and purity which you would have, if you had read the laws of the created world, and those which have been revealed and placed before your eyes? Where have you read in these laws, that no duties to yourself, and to your associates, nor to the *Lawgiver*, were enjoined upon you? Have you not been told by every breath you draw, by every movement of your frame, by every thought of your immortal mind, by every just pleasure that you have had, by every pang that you have suffered, and by all that you have been made capable of perceiving and learning, that there were laws prescribed to you in your trust, and that an account of your stewardship would be exacted from you by a Judge who cannot be deceived?

SELF-LOVE.

It is an invariable law of nature, that every human being shall do those acts which he thinks will secure good to him, and that he shall avoid those acts which will occasion evil to him. Why, then, should not every one do any and every act in his power by which his own will may be gratified, and avoid doing any and every act which is disagreeable to him? The only answer that can be given to this question is, that man is a free agent, intrusted with the power, and charged with the duty, of ascertaining for himself what is good and what is evil; and that this power and duty extend to those with whom he dwells in society, and also to his Creator.

Children always conform to the natural impulse of self-love, until they learn, from the discipline which is applied to them, that they cannot have their own will without subjecting themselves to a suffering, the dread of which controls the natural impulse. They learn, after a time, that the greater good lies in giving up what they will to do, and doing what is required of them, rather than to meet the certain consequences. We think that the whole science of morals will be found in the principles contained in the truth above stated.

Self-love is just as strong throughout life as it is in childhood. It is that quality of our nature to which all excellence may be referred; but it is also that to which all unworthiness may be referred. As the dread of punishment, or an unwillingness to displease those whose kindness a child desires, will restrain him, or put him into action; so, in more advanced life, the dread of suffering a certain or probable evil, and the certainty of losing the good will of others, will restrain or impel to act. With those whose minds have been properly disciplined, and who have learned to comprehend their relation to the Creator, there is a far higher motive, which is founded in a submission to the Creator's laws. As one goes on in life, he may or may not acquire more and more clear and just perceptions of what will be the greatest good to himself, and how he can obtain it. It is a self-evident proposition, that if a person could certainly know what it would be best for him to do, or not to do, in relation to all things and persons, and under all circumstances, and if he should conform to this knowledge, he would best obey the impulse of self-love, and most exactly conform to the laws prescribed for his good.

It cannot be too often impressed upon the youthful mind, that *life is to be taken as a whole:* for if this extended view be not taken, it must frequently happen that it will seem right in certain circumstances, and when the view is limited to these circumstances, that certain acts may be done or avoided as the greatest good. Yet, if the consequences could be foreseen, they would disclose that this seeming good would turn out to be a

positive evil. It often seems good to the young to avoid the performance of labours which are assigned to them, and to spend in amusement the time which should be devoted to fit them for duties which will be incident to their future condition. This misapprehension of good is to be lamented; but with some this is not all. Their own self-love prompts them to engage in a course of folly, so that not only do they fail to obtain that which is real good, but they find, under the mask of pleasure, that which proves them to be the most grievous suffering.

The same truth runs, in an endless variety of forms, into manhood, and through all the stages of life. We are impelled by self-love not only to provide for the craving wants of our nature, but to seek pleasure, riches, power, distinction, and luxuries. These propensities are given for wise and beneficent purposes. It is the misapplication of them, as seen in the world, which constitutes human misery. He is called brave and honourable who defends himself, even at the risk of life, against those who would do to him that injustice and wrong which would make the gift of life of no value. But the brave, who invade the rights of others, and subject them, by violence, to losses and to sufferings, without cause, misapply this principle of action. To get riches by honest industry, or the reasonable exercise of one's talents, is a commendable use of self-love. To get riches by unfair and dishonest means, to hoard them up, and to brood over them in secret, is a pitiful misuse of this commendable impulse. To have power over one's fellow-men, and to use it faithfully, and for their benefit, is a relation which one may honestly and commendably desire, as a reasonable exercise of self-love. To seek such power by deceitful representations, and to obtain it by violence and fraud, and to use it for purposes of supposed self-benefit, and to the injury and oppression of others, is another form of self-love. But there are few, if any cases, in the history of mankind, in which self-love has appeared in the latter form, without eventually overwhelming the agent with disappointment and sorrow. It is true that for a time such an one may seem to flourish in his schemes, and command the applauses of those who look up to him in his apparently fortunate elevation; but, in the very nature of things, if his heart could be sounded, there is not one whom he looks down upon, who is not more at ease than himself. His day of humiliation may be at hand, in the course of events which he cannot control; and if not, he learns, when it is too late to correct his error, that he has misapplied the impulse of self-love. This misapplication is to be seen in many cases of daily occurrence, and in things of little, as well as in those of comparatively great, importance. The principle is everywhere the same.

We shall be answered, perhaps, that all this is incident to human nature. There is no help, it is said, for these evils. Every boy who has learned Latin repeats the maxim, *Humanum est errare* (It is human to err). A more mischievous maxim was never invented. If men understood, as most certainly they may do, that they need not err, and that it is best for them they should not, they would rather adopt as a maxim that none but the wilfully ignorant, and the wilfully foolish, *err*. Such a state of things is yet afar off. It may seem to be foolish, indeed, to assert that any society should ever come to be so well informed as to make a proper use of self-love. Let us not despair. We may improve very slowly; yet, if every one does even the little that he can, in showing, by precept and example, what things a rational and accountable being should desire, and what he should avoid and reject, certainly the time may come when self-love will never be so misapplied as to be necessarily followed by penitence and sorrow.

Will it be denied that there is a certain best course of action for every human being, in every possible condition in which he may find himself? Or, that no small proportion of human suffering arises from not having discerned that it was best, in past circumstances, to have acted differently, or not to have acted at all? Or, that whether one did or did not act, in the supposed case, that his motive was to secure to himself the greatest good of which that case was supposed to allow? If these things cannot be denied, then the great end of life is so to regulate self-love as that it may secure the greatest good. Let us suppose that every person in society knew what it would be best for him to do or not to do, so that his physical, intellectual, and moral condition, should be as good as he could make it. His self-love would never be directed to any end which would impair his bodily powers, or keep his mind in ignorance, or misinformed, or make him a subject of reproach or contempt in his own view, or in that of others. This, it will be said, is an impossible state of things. So it was said that it would be impossible to root out the use of *ardent spirits*. This great change is not wholly accomplished; but does any one doubt that great advance has been made towards its entire abolition? Let us go on, then, in the work of improvement. Let every one try to show the proper uses of self-love. The day may come when every one will admit that all the sufferings which may visit the human family are of their own making, those only excepted which arise from the general laws of the Creator. As to those, they may be greatly mitigated by intelligent moral agency. When these come, they can and will be endured with piety and resignation, if the sufferer can console himself with the certainty that he has done no wrong thing, nor neglected any proper one, to which the cause of his sufferings may be referred.

LABOUR.

It is commonly considered that labour is the *curse* declared to [illegible] as a consequence of the transgression of the *fi* [illegible]. It is foreign to our purpose to enter into any discussion as to the true meaning of this historical or allegorical account; the Christian revelation may not be dependent on a literal understanding of it. However this may be regarded under the influence of further reasonable research, we must take man as he is; and so considering him, labour is not an *evil*, but a *pleasure*. Is it a curse to man, as he now is, to be enabled *by labour* to comprehend the existence of the Deity, and the beauty and utility of his works? to adorn the earth and bring its productive power into action? to apply the material substances of the earth to reasonable use, convenience, and ornament? to expand and improve the human mind? to cultivate and strengthen the moral power? Certainly these are the effects of labour; and labour so applied constitutes man's highest happiness.

There are two kinds of labour:—1. Mere bodily labour; 2. Labour of the mind. These two are sometimes necessarily combined. The mind and the body demand some sort of employment. No one whose mind is free from natural defect can prevent its action. It will think of something, good or evil, profitable or foolish. Every one who attends to the operations of his own mind, must be convinced that this is so. The body and limbs cannot be kept in any one position for any considerable space of time, unless they have been in action and demand repose. If it were painful to us to direct the action of the mind to useful labour, and if it were distressing or inconvenient to us to exercise our muscles for purposes which we believe to be proper, then it might be that labour is a curse; but many, nay all, who require of the mind to perform its duties to any useful purpose, and especially those who have disciplined the mind to an accustomed service, find that the absence of employment is an affliction. We cannot see how this should be otherwise, if we rightly comprehend man's relation to the universe, of which he constitutes a necessary part.

As to bodily action, it is seen that children in their sports go through a series of exertions, often exceedingly violent too, from mere pleasure. Men frequently exercise the body much more severely in matters of amusement than they have any occasion to do in necessary labour. This action seems to be a dictate of nature. In many cases of indisposition, bodily motion is the prescribed remedy, and is commonly a successful one. There are sound reasons why this should be so. There is an universal action of the material system to which man belongs, and a continual waste and demand for supply. Excepting only in the involuntary movements in man's structure, which are not confided to his care, he is required to aid nature in her operations. If he would put himself in the best condition to receive and derive pleasure from his daily food, he must keep himself in action. Those who have the least pleasure in using what was given to be used as the means of pleasure to the senses, are those who keep the body inactive. This is true of those who labour with the mind only; more strikingly true of those whom affluence excuses from labour of body and mind. They seek happiness in indolence and in luxury. They find it not, because they violate a law of nature. No product of the vineyard, the field, or the sea, however aided by inventive art, will furnish a welcome repast to one who sits in listless idleness, on a downy cushion, from breakfast time till dinner. The day-labourer who sits down to his coarse meal, has a pleasure to which the luxurious idler is a stranger. The one receives a rational benefit from the kind and just bounty of nature; the other seeks it where nature has decreed that it shall not be found.

The labour of muscular action is not only in itself a pleasure, but it is the means prescribed to us for the acquirement of subsistence; for the gradual improvement of society; for applying natural and artificial products to our comforts, to our convenience, and to reasonable luxuries. Nor only so; this is the groundwork of all the beautiful and imitative arts; of the discovery and application of the chemical power of matter; of the wonderful contrivances by which man securely moves on the face of the ocean; by which he cultivates his acquaintance with the stars, and raises his thoughts to the Author of all being. Let us not, then, regard labour as a curse, but a blessing, and rank it among the many causes for thankfulness. It is obvious that muscular action would have been given to us in vain, if it were not directed by intelligence. There must, then, be labour of the mind. This is nowhere said to be a curse. If there be any thing for which we should be specially thankful, certainly it is that we are blessed with the power of mental exertion. This labour is in itself a source of happiness; and in its fruits has made, out of savage man, a rational and improving social being. The most restless and comfortless of all creatures is he who has no occupation for his mind. If one would invent the most miserable condition for a human being, other than mere physical suffering of the most excruciating kind that can be, without extinguishing life, it would be to deprive him of all employment of body and of mind.

Can there be a doubt that, in man's present condition, the ability to labour is his exalted privilege? And is he not accountable for this privilege? Is not reason given to direct him in the use of it? It is well known to those who have compared the condition of mankind in different ages, how much the labour of body and mind have been able to accomplish. Even within the last half century, the most surprising changes for the better have taken place, from the right use of this productive power. On this depends the condition of the human family. From the joint labours of all who wish well to their fellow-men, there will be obtained, eventually, the knowledge of the best manner of using the products of the earth, the best mode of ruling men in their social relations, the just homage due to the Creator, and the true purpose for which human life has been given.

To some descriptions of persons, labour is irksome. They are obliged, in their vocations, to use certain muscles, and those only. They repeat the same act throughout the day. Their labour becomes tedious, because it requires little or no action of the mind. To this numerous class we venture to offer a relief which is within the easy reach of many of them. It is well known that the nature of habit is such, that the hands will do what they have been accustomed to do, without any obvious attention, and the mind is left to do what it will. The mind might be employed, while the hands are busy, in pursuing some connected train of thought. Muscular action, so far from being an interruption to the action of the mind, may be made to assist it. Persons who think intently are often seen to have some habitual movement; and we have heard several persons acknowledge that their best ideas had come to them when they were engaged in some simple occasional duty, such as the folding of paper, or the cutting of the leaves of a book. The stir of body seems to produce a corresponding stir of mind. The relief which we suggest is, that sedentary labourers should provide themselves with subjects for reflection, and exact of their minds to attend to these subjects. By such simple means, the memory may be strengthened, the stock of knowledge may be greatly increased, and the mind surprisingly invigorated. One might begin this exercise by attempting to remember, with the utmost precision, every act done during the preceding day, and so go back from day to day. Better still would it be, if the purpose were to see wherein one had not done as well as he might, and as he may wish he had done. This exercise may be applied, also, to the contemplation of subjects suggested by reading; and this contemplation will raise questions which will lead to the examination of books. There may be hundreds of poets, philosophers, and moralists, at the work-benches in this country, who have no thought, of themselves, that they are such. It is in the power of any person who can read and understand the English language, to strengthen his memory, give himself an interesting employment, and furnish himself with a rich fund of the truest philosophy, in this manner. He may commit to memory six lines, each successive day, of Pope's Essay on Man, and on each day repeat all he had learned on preceding days. On the 218th day he would be able to repeat the whole essay. This might be done without losing one moment of time, and without making the slightest error in one's work. When accomplished, it would be an intellectual treasure for which any man might be thankful, and of which he might be justly proud. The first efforts may be discouraging, but perseverance will ensure success. Every one who is accustomed to thinking can attest that most new subjects are at first confused and undefined; but they gradually disclose themselves, and fall into shape and order, just as material substances, used on the work-bench and the anvil, take that form, smoothness, and polish, by successive operations, which the workman requires.

HABIT.

This quality of our nature has engaged the attention of many philosophic minds. It has been considered an *ultimate fact*, as it is called; that is, one of those qualities, which, like respiration, digestion, and many others, are found to exist: and beyond which fact no investigation can be made. Its laws, rather than its nature, have been the subject of remark. It may be, that habit is to be referred to the law of action, which appears to

pervade all material and intellectual being. Life is divided into parts; in one we are awake, and active; in the other, wrapped in sleep, and quiet. Each successive day is a sort of new existence, in which we are to repeat many of the acts of the preceding day. We repeat these acts, because nature demands the repetition of them. Also, almost every one is engaged in some vocation, on which he relies to supply his wants and gratify his wishes; and most persons have in view certain pleasures, which are innocent, or otherwise. It seems to us that habit arises from this demand for action, and from the manner in which this demand is supplied. Action relates to ourselves, to other persons, and to things around us which minister to our wants; supplying its demands associates us with these persons and things. The want, whatever it may be, arises, and forthwith all things connected with satisfying it force themselves into notice, and these become a part of our very existence. It is a well-known fact that the appetite for food will associate itself with a particular hour of the day, and with persons, places, and objects of gratification; so that one becomes hungry rather according to the hour than the natural want.

It may perhaps be an ultimate fact, beyond which we cannot go, that those acts are most easily and well done which are oftenest done. One who uses a flail, an axe, a scythe, a sword, or a pen, can use either the better the oftener it is used, until he arrives at a point of excellence at which his power of improvement stops. This may perhaps be accounted for by supposing that the first effort which the mind makes to direct muscular action, is the most difficult one. After repeated efforts, the mind seems to understand better and better how to direct, and the muscles how to obey, till at length a very slight effort of the mind seems to be all that is required, and even an effort so inconsiderable and rapid as not to be the subject of notice. On this, too, seems to depend the astonishing facility of action to which (among many other instances) jugglers and musicians attain. This is called *habit*, which word is derived from a Latin word which signifies custom or use. There are customs or habits of the mind as well as of the muscles. Persons who accustom themselves to extemporaneous speaking, acquire a surprising ease and readiness in the complicated action of conceiving, uttering, and expressing, by sounds, by looks, and gestures, whatsoever they would impress upon an audience. The mind has its own habits also, in the quiet of contemplation, and in exercising its various powers. It has its own associations, too, with external objects, of which many curious instances are stated in philosophical works.

The moral deduction which we make from these general principles is this, that there is a continual craving to do some act, to obtain some object; or a continually recurring necessity to do some act, to prevent an evil or inconvenience. The frequency of this call upon us to do something, whether it be for eventual good or evil, leads to the practice, custom, or habit of doing; and in some cases the impulse to act becomes so powerful that reason, self-respect, the laws of society, and even those of the Lawgiver of the universe (if these are heeded) present no sufficient barrier to the impulse. It is to this all-important truth in the nature of man, that we earnestly invite the attention of the young. The capacity to create habits is the consequence of the power given to us to promote our own welfare, individually, socially, and as accountable beings. This capacity was designed to fasten us down to that course of action which will accomplish these ends of our existence. Like every thing else with which we are intrusted, it may be rightly and profitably used, or may be misused, and perverted to our certain ruin. Habit is the kindest friend or the cruelest foe to human welfare. When it assumes the latter character, it approaches us in the most deceitful and seductive forms. It comes wearing attractive smiles—it delights—it fascinates—it substitutes its own irresistible will for our own—it triumphantly points to the gulf to which it bears us. The fly caught in the spider's web is a faint illustration of the power of habit. He knows, from the first moment, his destiny. The gambler, the drunkard, and the felon, when and how do they learn that they have been caught in the web of habit!

INTEMPERANCE.

This word has attained a meaning more limited than its proper one. It is applied commonly to persons who take habitually ardent spirits; but it is equally applicable to all transgressions of the law of moderation. All acts which may be lawfully done for one's own good, when carried to excess, are acts of intemperance; and all such acts are sooner or later followed by some sort of suffering, according to their nature and degree. Excessive labour of body or mind is as much an act of intemperance as to make one's self dull and stupid by taking food, or irrational and giddy by taking spirits. But there is a wide difference in the degree of immorality in the kinds of excess. An intemperance in study, which brings untimely death in some instances, is not condemned as an immoral transgression (though it certainly is such), for the motive which leads to this intemperance is an honourable one. The loss of health and character, from abusing the privilege of taking nourishment, is universally condemned, because the motive, and the acts done in obedience to its impulse, are irrational and disgraceful.

There are two kinds of intemperance against which the young should be warned. The one is drinking, not for nourishment, but for pleasure; the other is, using tobacco. It has been already demonstrated that nature requires a certain quantity of proper food to maintain a healthy and happy condition of body and mind; also, that excess of any kind will be followed by suffering. This is just as certain as that a full vessel must throw off just as much as is added to its contents. It is very natural that young persons should assemble for the sake of society; being assembled, they must have some employment for the muscles of the body and the craving of the mind. We have shown that such propensities spring from natural constitution, and that they must be satisfied. There must be a community of purpose in the meeting. That may be found in any muscular action in which all can join, and which has some definite object, as athletic games; or it may be found in some intellectual employment which is common to all present. Unhappily, the most frequent bond in such meetings is, *to drink*, for in this all can join. Connected by this common attraction, the mind is called into action; but for what purposes? Those who frequent places of public entertainment can answer this question. Some who are sent to public seminaries can also answer it; and some can answer it who know that they are maintained *there* by pinching economy at *home*. Some others could answer it, who never had a serious thought why such places were established, nor for what uses they were intended.

We refer again to the demonstration heretofore made, that the law of nature, which cannot be broken with impunity, inexorably admits so much, and no more. Let us, then, look in upon a gay company of young persons, around a table, and half concealed by tobacco smoke. What sort of air are they breathing? what sort of substances are they casting into their physical system, already bursting with excess? what sort of thoughts have they in their minds? and what sort of words are flowing from their lips? We *could*, but will not, answer these questions for them. Let us pass by this revel, and go to the next morning. We might then

propound some other questions. Are not their heads heavy, hot, and throbbing? Are not their eyes thick and burning? Are not their tongues white and parched? Do not the nerves tremble? Is not the mind muddy and confused? In what condition are they to perform duties to themselves, to those they serve, to instructors, to affectionate parents? *Is not this dear-bought pleasure?* How long can nature bear to be *pleased* in this manner? This matter does not stop here. The same scene is repeated again and again. *Soon habit asserts its awful dominion;* and then the scene *must* be repeated. The craving cannot be resisted. From social drinking, the step is an easy one to solitary drinking. *There is no resting-place for habit; every thing in this system of being must keep on, or end.*

It is believed that the sort of criminal excesses to which we allude, are not from the promptings of nature. We venture to assert that they are entirely artificial in the beginning. It seems irrational that any one should like to take more of any thing than nature requires; and more so, that one should naturally desire to take burning liquids to the degree of intoxication, or perhaps to take them at all. It is believed there is no such natural propensity; but that such liquids, when first taken, afford less pleasure than pure water. The taste for these articles is created by association, by imitation, by fellowship; and, above all, because there is a kind of tradition that it is *manly* to drink. Songs in praise of the juice of the grape, and of meaner liquors, have some effect in the delusion of drinking. There is a fascination in combined poetry and melody. Such combinations are well known to have the most powerful influence in national associations. They inspire a feeling which bears men on to victory or death. The songs of Bacchus do the same. They conquer the strength of those who sing, and of those who listen to them, and sometimes lay their admirers not in the bed of honour, but of contempt.

If one could get the ear of such a misguided youth, he would not do much by reasoning with him. He might do something by getting him to reason for himself. It would be necessary to bring to his view some facts from which he could reason. He must be made to know what a wonderful contrivance the digestive power is, and by *whom* it was contrived. That its purpose is to take the inanimate substances which nature provides for it, and convert them into living sensitive being, and, possibly, into thinking power and immortal spirit. He must be reminded how easily every human contrivance may be deranged, and the more so, and irreparably, in proportion to the minuteness and delicacy of construction. But as one might fail to make a thoughtless boy comprehend the nature of the principle of life which resides in his own bosom, because he cannot see it, some illustration must be made. Unhappily, there is none which can be effective to this end. The nearest that occurs is this. Let us suppose, then, one knows the use and the value of the human eye in its physical, intellectual, and moral relations; that he knows he must take care of it, and frequently bathe it in cold water, as well to cleanse it as to refresh and brace it, so that it may still be an eye to him, when decline and old age shall come. Let us further suppose, that, instead of so using and so preserving this delicate organ, he should, when he first rises in the morning, let fall into it a drop of burning spirit, and at eleven o'clock another, and so on, at the proper hours, until he sleeps again—how long would the power of vision remain to him, and how soon will this organ of delight become a source of insufferable pain? It must be much the same with the digestive organs as to the abuse of them.

If one could, in some such way, bring home to the perception of an erring youth the grievous wrong which he is inflicting on himself, he might be prepared to reason on his own case, and might be asked some such questions as these. Is it of any consequence to you to be free from suffering and sorrow? As you must inevitably keep company with yourself as long as you live, is it of consequence to you to make of yourself a pleasant and agreeable companion, and not one who will be continually complaining and upbraiding? Is health of any value to you? Can you use your limbs, and the faculties of your mind, as you would like to do, without it? Can you have health, if your habit is to throw into that delicate part of your system whereon the action of life depends, substances which excite it to an unnatural exertion, or deprive it of all power of exertion? Does not every part of your system sympathize with the injustice which you do to your digestive organs? Will not your brain, and consequently your mind, suffer by this violence? Do you expect to attain middle age, and old age? Will not the seeds you are now sowing come up in that space of time? Will they come up in the form of enfeebled muscles, chronic aches, self-reproaching thoughts, the loss of the capacity to enjoy the bounties and beauties of creation? Will they grow up to overshadow your moral sense, and shut out the delights of intellectual power? Was life given to you for the few years in which you can sing, drink, and "enjoy yourself," or that you may enjoy life in every stage of it, as a rational being, and by rendering your homage to nature in obeying her laws, and your gratitude to Him who ordained these laws for your happiness? Do you not look forward yourself to be at some time a parent? Have your own parents ever so conducted themselves towards you, that you have a right to punish and afflict them? Are you willing that your parents should see you and know you as you know yourself? If you should be a parent, are you willing that your children should be told with whom, and in what manner, you "enjoy yourself?" Would you tell them how you spent your youthful days and nights, and recommend to them to take yourself as an example?

TRUTH AND FALSEHOOD.

These two subjects relate to two parties: 1. That one who speaks truth or falsehood; 2. That one to whom it is spoken. We propose to consider this matter only in relation to the first party, and as to him in two views. 1. Whether there be any, and what law, which requires that the truth should be spoken; and, 2. What good or evil one may do to himself by lying.

1. One reason why truth should be spoken is, that the knowledge which any one person can have from the use of his own senses, in many things which it most materially concerns him to know, is very limited. He must therefore often depend for his knowledge on what others say to him; and when the thing spoken of is exclusively known to the party speaking, the other must rely entirely on what he says. If, therefore, it be considered how great a part of the most serious concerns in life proceed on declarations made by one person to another, we may readily conceive, that, if these could not be relied on, the affairs of mankind would be greatly embarrassed, and confidence in each other would be destroyed. As this matter of speaking the truth is one which concerns all persons, so all persons agree in holding liars in contempt. Even the very lowest persons consider themselves to be disgraced when charged with the guilt of lying. They can endure charges which would subject them to public punishment, with more composure than they can endure this. A lie is always understood to be resorted to, to secure some advantage or prevent some evil to the person who resorts to it; or to occasion some disadvantage or injury to the person to whom, or of whom, the lie is told; sometimes both these purposes concur. The object in view is always an immoral one, and the means used are always regarded as disgraceful. It is at once obvious that wilful falsehood is forbidden by natural law, which is intended to regulate our social relations, and is expressly forbidden by divine law, which condemns all acts

of fraud and deceit, and commands us to do to others as we would have them to do to us.

2. It is a rare occurrence that any one who descends to falsehood succeeds in the object which he may have in view. He is commonly detected, and, if not, is suspected, which may operate quite as much to his disadvantage. If he should escape detection and suspicion, he lives in constant fear of both. He has a very troublesome secret to keep. If he should be able to do this, still he cannot hide it from himself that he is a liar; and such a person, by natural justice, is compelled to pass that sentence upon himself, which he knows that others would pass upon him if they were as well informed as he is. A liar is therefore obliged to feel like a guilty person, and a habitual liar very soon comes to look like one. If there be no higher motive than one's own interest and welfare in speaking the truth and avoiding falsehood, this is a very sufficient one. If a man is known to be a person unworthy of confidence when he speaks, he has not the benefit of being credited even when he speaks the truth; he voluntarily deprives himself of the advantages of social life; his assertions secure to him no credit; his promises are contemned; he makes himself to be alone in the very bosom of society, for every one shuns him. In the administration of justice in courts, a person is not regarded as a witness, whose common reputation is that he is not believed when he speaks. The objection to him is not that he might not tell the truth in the matter which is on trial, but that such a person ought not to be received as a witness, because he cannot be credited in any thing that he says. When such a person has been called and examined as a witness, it is usual to examine other witnesses to prove his character; and if it be proved that he is unworthy of credit, what he has sworn to is disregarded, though he may have declared the truth. This is the common fate of all such unfortunate persons in society, as well as in courts. Independently of the criminality, lying is very poor policy. If the object be to obtain a supposed good, it rarely is obtained by such means; and if it be, the price so paid must always be greater than the good is worth. If the object be to conceal a wrong done, it is rarely successful; and if not, it leaves the offender without excuse for his error, and adds another wrong. If the object be to charge an innocent person with a wrongful act, or to deprive one of his good name, or of some lawful possession, or subject him to some evil which he ought not to endure, the offence is of that cast which the law of the land holds to be *malicious*, and it deals with such offence accordingly. In short, it is very difficult to violate any law of natural justice or divine prohibition without encountering an adequate punishment; and it may be assumed that the punishment which follows lying is as certain and just, as in any instance of criminality. If every tenant of every prison, and if every person who is in the custody of a goading conscience, were asked this question, *What was your first step from innocence and purity?* he would probably answer, *Telling a lie!*

SINCERITY AND INSINCERITY.

These are other names for truth and falsehood. They are not commonly applied to the most serious concerns of human life, but to what are called the "imperfect obligations." Such obligations, it is well known, are not enforced by the law of the land, but are binding as duties arising as well from natural law (reasonably expounded) as from divine law. Sincerity is a duty to one's self, because it is demanded by self-respect. As every one has an individual separate physical being, so every one has a *separate circle* within which he exists, and into which no one has a right to intrude. His thoughts, motives, opinions, and policy are his own. What he will or will not do (so that no wrong be done to others, and no act of duty be withheld from them) is for him to decide upon. Within this circle, he makes up his judgments on all persons and things. In his outward deportment, he must frequently act in manner not consistent with these judgments. As an example: one has made up, from repeated observations of a certain individual, a very clear but very unfavourable judgment of his qualities; but there is no occasion to disclose what the judgment is. The observer is obliged, or finds it convenient, to meet this individual, and to deal with him, and perhaps to interchange courtesies with him. It is undoubtedly proper to manifest the respect, in such case, which the decencies of life require, and to show the common proofs of good will. There is no insincerity in this. Though no one can possibly avoid forming judgments of others, nor avoid liking or disliking them, even including very near friends and relatives, yet there may be a positive violation of duty in publishing these judgments or in disclosing these feelings. The Divine law, "judge not, that ye be not judged," does not, it is believed, interdict these judgments, because they cannot but be made; but it forbids the wanton, unnecessary, and injurious publication or manifestation of them. Those who are keen observers of their fellow-men, see in their faces, in their manners, in their modes of speaking, in their tones of voice, in the sentiments which they express, &c., causes for respect, esteem, confidence, and approbation; or they may see causes for disrespect, suspicion, strong disapprobation, and disgust. But all these things belong to the *individual circle*. It is not insincere to keep them there. On the contrary, society would be intolerable if they were not kept there; it is very hazardous to the observer to let them out unnecessarily. He may be mistaken both as to the favourable and unfavourable judgments which he forms. Further observation, new circumstances, unexpected changes, may essentially correct his judgment; and, therefore, a prudent man will keep them to himself: they are his own peculiar property, and were obtained for his own use. Insincerity is often demonstrated by paying false and silly compliments, which assume the form of *flattery*—a word which is derived from the Latin, and signifies wind, breath, puff. This is a kind of aliment which perverted self-love finds to be exceedingly pleasant. Although it is in truth precisely what its origin indicates, there is hardly a man, woman, or child, who is not disposed to partake of it, if it be artfully disguised. But, on the other hand, all sensible persons, of whatever age or sex, who see what it is, and why offered, feel for the flatterer the contempt which he deserves. This insincerity is, and ought to be, deemed a high offence. It implies art and deceit in the flatterer, and sufficient weakness in the flattered, to be subdued to the purpose in view. The flatterer's purpose may be no more than to secure to himself a better esteem than he can have any pretence to, and it may be, through that, to secure to himself something which may be very costly to his victim.

CIVILITY.

The well-being of society would be greatly promoted if the nature and use of this Christian virtue were more generally known. We take this to be, in personal intercourse, the observance of the command, Do to others as you would that others should do to you. The most rapid glance at any community shows this—that some of its members are brought into contact, in matters of business, necessarily; others meet, incidentally, who have no particular connection; others meet for social purposes, in various forms: and that there is a large proportion who know of each other very little beyond the fact that they are of the same country, and perhaps not even that. There must be a *best rule* of deportment for all these classes; and no one will deny, that if this rule were defined, and faithfully applied, there would be much more of every-day comfort and complacency in the

world than there is well known to be. If we rightly understand the meaning of civility, it is the manifestation of kind feelings, and of a desire to do all things which are to be done under the influence of such feelings, in a becoming and agreeable manner.

If every person understood the true foundation of society, the common origin of all its members, their natural and necessary sympathies, their community of interests, their necessary action upon and with each other, it might be supposed that all who are reasonable would be civil. They would be so, because they would promote their own good, because they would be doing what it is proper to do to promote the good of others; and because they would know, that in so doing they would conform to the design of their creation. We do not include under the term *civility*, the great duties of justice, acts of munificence, important personal services. These arise out of some special relation which an individual bears to one or more other individuals. It seems to be limited to the manner in which the common or accidental intercourse of the members of society in general should be carried on. This matter may be better understood by some examples. Thus, if one comes into the presence of another as a beggar, servant, labourer, mechanic, trader, merchant, farmer, lawyer, physician, clergyman, or public officer, or if it be a female, or child of either sex, there may be very various modes of receiving these different persons—yet, certainly, by every one of the laws which we are endeavouring to illustrate, these several persons are entitled to civility. Even the beggar—perhaps one should rather say, the beggar in particular—if not deformed by voluntary transgression, should be received with civility; that is, gentleness, kindness, decorum, are to be observed relatively to each one. Why? because no man can afford to be deemed insensible to the cause of reasonable humanity; nor a stranger to the decencies of life; nor ignorant of what is due from him, nor to him, in any of his proper relations.

There is one other consideration which operates on all men who have had much experience in the world. Men and things change, and take new and unexpected relations. Persons who have been long, and even intimately connected, suddenly or gradually sever; persons who have known little of each other, and that little uninteresting or unfavourable, are brought in contact by some unexpected turn of affairs. Sometimes one needs favour or at least good will, from those he never thought to be of the least importance to him. In such, and in a multitude of other circumstances, one may find the advantages of having been acquainted with the virtue of civility, which implies that one has given no unnecessary offence. There are other cases in which one is called on by duty to do things disagreeable to himself, and exceedingly so to others. But there is no good sense in performing such duty morosely, and with inhumanity.

POLITENESS—GOOD MANNERS.

A refined species of civility is sometimes expressed by the term *politeness*, which is an exterior indication of good breeding or good manners, and may be defined as that mode of behaviour, which not only gives no offence, but which affords agreeable sensations to our fellow-creatures. In our intercourse with the world, this species of civility is imperative. We possess no right to give offence, by language or actions, to others; and we are bound to conduct ourselves agreeably to the reasonable and set rules of society. Some severe writers on morals have confounded *politeness* with *insincerity*. They seem to imagine that the act of speaking gracefully to another, is necessarily mere grimace, or an empty flourish signifying nothing. In many instances, with insincere people, this may be the case, but it is not so with those of well-regulated minds. It is always better to speak politely, that is, with extreme propriety and delicacy, than coarsely, sulkily, or impertinently. We say, cultivate politeness of manner by all means, for it is *refined civility*, and will spare both ourselves and others much unnecessary pain.

Civilized society has in the course of time instituted certain rules in the code of politeness, which, though of little actual value, it is every one's duty to learn, because, by knowing and acting upon them, we can make life glide on much more smoothly and pleasantly than if we remained in ignorance of them. These rules are sometimes called the rules of *etiquette*. We shall here mention a few of the more important of these social regulations:—

1. *Honour to the female sex.*—Women are physically weaker than men. They are unable to defend themselves from insult or injury, and it would be considered indelicate for them to do so, even if they possessed the power. For these and other reasons, it is only simple politeness and a sign of good sense to render any little service to women—to assist them when they appear in any difficulty, to speak respectfully of them and to them, and to give them honour whenever it can be reasonably required. It will be observed, therefore, in what is called good society, that women are treated with exceeding delicacy and deference; they are offered the best seat, or the only seat if there be no other; allowed to walk next the wall, or at the farthest point from danger, in the street; never rudely jostled against in a crowded thoroughfare, and are always parted from with a respectful bow. All this is considered essential in good manners, and attention to it will not in the smallest degree degrade any man in the opinion of the world. At the same time, as respects the women who receive these attentions, it is expected that they will not "give themselves foolish airs," or presume on the forbearance and kindness of the stronger sex. In fact, no female will do so who is acquainted with good manners, or wishes to avoid being despised.

2. *General courtesy and respect.*—It is incumbent on every one to be courteous or respectful in his intercourse with neighbours, acquaintances, or with the public generally. To inferiors, speak kindly and considerately, so as to relieve them from any feeling of being beneath you in circumstances; to equals be plain and unaffected in manner; and to superiors, show becoming respect, without, however, descending to subserviency or meanness. In short, act a manly, courteous, and inoffensive part in all the situations in life in which you may be placed. Society, for good and sufficient reasons, which it is needless here to explain, has ordained certain modes of address, and certain exterior signs of respectfulness, which it behoves us to support and personally attend to. In eastern countries, as of old, it is the custom to uncover the feet and to sit down, in token of respect, on going into the presence of kings, or on entering any religious edifice or private dwelling. In our country, the custom is entirely the reverse. It is an established mark of respect to uncover the head and to stand, in the situations which we have mentioned, and to this point of etiquette we are bound to adhere. We must not, from any crotchet of our own, violate the rules or customs which society sanctions and enjoins, as long as these rules and customs are not opposed to reason and sound morals, and only refer to such trivial arrangements as taking off our hat, making a bow, shaking hands, or other matters equally unworthy of deliberate consideration. None but persons of a silly, eccentric turn of mind, think of disputing about these trifles. On the same principle, give every one the title, which, by law or courtesy, he usually receives.

3. *Personal behaviour.*—A well-bred man is always known by the perfect ease and tranquillity of his man-

ner. These are points to be carefully cultivated. Acquire, if possible, an easy confidence in speaking, so as never to appear abashed or confused; taking care, however, not to fall into the opposite error of forwardness or presumption. Persons moving in the highest circles of society never allow themselves to appear disturbed or vexed, whatever occurs to annoy them. Perhaps there may be an affectation of indifference in this; still their conduct is worth admiring, for every thing like fidgetiness or boisterousness of manner is disagreeable to all who witness it.

Carefully avoid the following things in personal behaviour:—Loose and harsh speaking; making noises in eating or drinking; leaning awkwardly when sitting; rattling with knives and forks at table; starting up suddenly, and going unceremoniously out of the room; tossing any thing from you with affected contempt or indifference; taking any thing without thanking the giver; standing in the way when there is scarcely room to pass; going before any one who is looking at a picture or any other object; pushing against any one without begging pardon for the unintentional rudeness; taking possession of a seat in a coach, theatre, or place of public meeting, which you are informed belongs to another; intruding your opinions where they are not wanted, or where they would give offence; leaving acquaintances in the street, or a private company, without bidding them good-bye, or at least making a bow to express a kindly farewell; slapping any one familiarly on the shoulder or arm; interrupting any one who is conversing with you; telling long and tiresome stories; whispering in company; making remarks on the dress of those about you, or upon things in the room; flatly contradicting any one, instead of saying, "I rather think it is otherwise," "I am afraid you are mistaken," &c.; using slang expressions, or words of a foreign language; acquiring a habit of saying, "says she," "says he," "you know," "you understand," &c.; helping yourself at meals, without first asking if you may not assist others to something which they would like; picking your teeth with your fork, or with your finger; scratching or touching your head; paring or cleaning your nails before company; mentioning the price of any article of food or drink which you are offering to guests; asking questions or alluding to subjects which may give pain to those you address; neglecting to answer letters. It would be easy to enumerate many other things which should be avoided as savouring of bad manners, but these will be sufficient to indicate the principle of politeness, and if that be understood, there can be no difficulty in knowing how to act with delicacy and discretion in all the concerns of life.

4. *Gentility and vulgarity.*—By attention to the rules of good breeding, such as we have just alluded to, the poorest man will be entitled to the character of a *gentleman*, and by inattention to them the most wealthy individual will be essentially *vulgar*. Vulgarity signifies coarseness or indelicacy of manner, and is not necessarily associated with poverty or lowliness of condition. Thus, an operative artisan may be a gentleman, and worthy of our particular esteem; while an opulent merchant may be only a vulgar clown, with whom it is impossible to be on terms of friendly intercourse. Vulgarity of manner is often exhibited, in its most offensive form, by persons originally of humble birth and breeding, who have risen to wealth by the force of fortuitous circumstances. It is not uncommon to hear persons of this class, particularly "ladies," speaking of "my coach," "my house," "my governess," "my family," "my servants," "my furniture," and so forth; all of which is *pure vulgarity*, and indicates a low tone of breeding, and weak understanding on the part of the speaker. A man or woman of refined taste never alludes to matters of dress, domestic convenience, or things strictly personal, and rather endeavours to direct conversation into those channels in which all may harmoniously join.*

ANGER.

One of the most important of our private duties is the due regulation of the passions. We naturally possess certain mental affections called *propensities*, which, when properly restrained, serve a good purpose, both individually and socially, but when let loose, or badly regulated by the understanding, lead to the commission of many vicious and abominable actions, which in moments of calm reflection, and when our conscience is aroused, we deeply lament and regret. Irritability of temper, as demonstrated in the passion of anger, is one of the most unhappy of these derangements of our intellect.

The causes of anger are supposed to be these;—First, by the law of nature and of society, every one has rights in what he regards as his own property; second, one has a right to hold unimpaired whatsoever he can justly acquire in reputation and character; third, he has a right to have his feelings respected by others, if he do no wrong to their feelings; fourth, he has a right to have the like rights respected in those with whom he is necessarily connected by family and social ties; fifth, he has a right to be treated with justice, and according to established laws, by those who are intrusted with power; sixth, he has a right to have those who are bound with him, in a common subjection to such laws, treated with justice. Whenever any one is offended by the violation of any of these rights, he may be justifiably angry. But in what manner, and to what end, he shall express his anger, so as to do himself the greatest justifiable good, is the thing to be known.

Every one who has had a violent fit of anger upon him, knows that it was to himself (independently of the cause and object of his anger) a painful and even a very distressing sensation. No one ever looked back upon such a state of things, as to himself, with satisfaction, but generally with regret, and sometimes with remorse. He feels humbled and grieved in his own estimation of himself. He may too well remember that he used expressions and did acts which he is grieved to have resting in the memory of others, or in his own. It is probable, also, that no one ever saw another in a violent passion, without feeling that this angry person was degrading himself, and acting more like a brute than a rational being. Whatever be the cause of such anger in another, cool spectators always regard the angry person as under a temporary loss of reason, and in danger of doing some serious mischief, and are prompted to restrain him. Every one feels, in such a case, that the least that can happen to one so acted upon, and so acting, is, that he is preparing for himself hours of self-reproach and of bitterness. If no one likes to remember that he was violently angry himself, and if he is offended in seeing others so, it must be admitted that violent anger is contrary to natural law, as it most certainly is to divine law. It is an abuse of the trust confided to us to promote our own welfare.

It is consistent with reason for any one, who is under the influence of anger, to be prepared to ask and answer the question, whether the wrong is real or only supposed, and whether he is himself free from the first imputation of having occasioned, by his own error, that which he regards as a wrong. If the offence is real, other questions arise, of this nature: What real good shall I secure to myself by attempting to get a reparation? and in what respect shall I advance my own welfare by attempting to punish the offender? May I not, in either of these attempts, involve myself, by words or acts, in some wrong, and give my adversary the advantage of finding me an offender, in trying to vindicate myself? If I

* The above section has been written by one of the editors.

could succeed in my attempt, what will it come to? Shall I not make the wrong done to me more notorious, and subject myself to the pity and compassion of others? Is it not better to be silent, and quiet, and leave the offender to time and his own conscience, than to engage myself in a controversy which is sure to be vexatious, and in which I shall run the risk of doing wrong, and in which I shall not be likely to get any good? If I succeed in humbling my adversary, I shall surely make him my enemy for ever: for, in the nature of man, he is slow to forgive the wounds inflicted on his own self-love. When this matter is over, and time has dissipated the mists which now prevent a clear view of it, and when other feelings and sentiments have arisen, shall I like myself the better for having been silent and quiet, than if I shall have attempted to command justice and to inflict punishment? It is probable that young and ardent minds, and those who are looking back by the light of experience, will answer such questions very differently. But the experienced can tell the young, with sorrowful truth, that among the most painful sufferings of life are to be numbered those which have arisen from sudden impulses of anger, expressed in words or acts. The experienced can also tell, with like truth, that in the common occurrences of life, angry words and acts have seldom, if ever, accomplished the purpose for which they were intended; they have neither obtained justice nor punished the offender; but, on the contrary, they have often converted the injured party into an offender himself, and involved him in bitter recriminations, keeping up an irreconcilable aversion, and even enmity, through life. We have, so far, supposed that a real and justifiable cause of anger existed. But it is in many cases imaginary, especially among young persons. They take up sudden impressions concerning the supposed conduct and words of their associates and acquaintances, when no such conduct or words have occurred; or, if any did, none with intention to wound or offend. If there be one case in which one feels himself peculiarly humbled, it is when he has manifested anger towards one who has committed no offence, or who is entirely unconscious of having done so.

It sometimes happens that an offended person can restrain himself from expressions and words when he has been seriously offended. But he cherishes a malicious sort of feeling against the offender, broods over the wrong done, and permits his imagination to inflame the sense of wrong, until he makes himself too unhappy, under this excitement, not to express it in some mode which will occasion pain or affliction to the offender. If there be any one who has fallen into such a condition, he may be asked, whether he knows of any thing in the nature of regret or remorse for his own follies and sins which is so exceedingly burdensome as to carry about with him the feeling of aversion, ill-will, and malice, towards one who has offended? What, then, is to be done? angry words and acts are forbidden by the law of nature, by self-respect, and by convenience; the memory of an unavenged wrong is intolerable. Is there no remedy? We think there is one in every person's power. If the individual with whom one is at variance can, by calm expostulation, or by mutual friends, be brought to a just perception of the case, that is the remedy. If that fails, there is another; it is of high authority: "if thine eye offend thee, pluck it out." Blot such a person from the memory; never permit him to come into your thoughts. Will you pass your life in humiliating bondage to such an one? We say, *blot such an one out of your memory.* You do him no wrong by that. You do yourself a just and great good; you cut a moral cancer out of your heart.

Among the sources of affliction in human life, is the uncalled-for interference of third persons in the angry collisions of others. It may sometimes be an unavoidable duty to take a part in an angry quarrel. When this duty is to be performed, it concerns every one who is mindful of the trust confided to him of taking care of himself, not to engage in the controversy in such a manner as to become a principal party in it. As a general rule, it is the safe course to let angry persons settle their own concerns as they can. Certainly, no one who claims to be regarded as having a discreet sense of his own welfare, plunges himself into a quarrel. Yet this is a very common thing. It is often seen in schools. Parties and divisions grow up, extend, and become more and more bitter, from the most trifling causes, and are often carried out into manhood, and show their evil consequences through life. This is so, because impressions made in that season are very vivid and durable. It is a duty sometimes to take a part in controversies. It must be remembered, when one engages in such quarrel, that one is dealing with persons who are under a sort of derangement, and who are most exceedingly sensitive, and perhaps mutually vindictive. Those who interpose are bound, by the law of self-regard, to interfere with calmness and sound discretion, and so to conduct themselves, in word and deed, as to do no evil to themselves while they attempt to do all the good possible to the angry parties. On the whole, mismanaged anger is a prolific source of suffering. Yet when calmly looked back upon, in a great majority of cases, the cause was some insignificant trifle, magnified into serious importance by angry words and pitiful acts. Such is the propensity of persons to busy themselves in the quarrels of others, that there is little reason to hope that a preventative can be successfully offered to any but to those who have studied out and who reverence the will of the Deity, as disclosed in the nature of things, and in his own positive law

SELF-RESPECT.

Every one has some sort of opinion, more or less distinct, of all persons with whom he is acquainted. This opinion may embrace intellect, disposition, virtues, vices, personal appearance, deportment, condition in life. So also every one has some opinion of himself on the same, and on many other subjects best known to himself. When one examines his own opinion of himself, he seems to do it as though he were another person. He uses the eyes of others. He turns aside, as it were, by the way, to see himself pass by. The judgment which one forms of himself is often much more unsound than that which he forms of others. The eye cannot see itself; so neither can any one see himself. He must use a mirror. There are many of these. History, books, daily example, his own experience, every person he comes in contact with, are mirrors. If he sees himself in these, and thereby corrects his own errors and follies, and gives himself reasonable and just credit for his attainments, he may come at length to be entitled to entertain a respect for himself. There is a certain best thing to be done, and a certain best manner of doing it, in all possible circumstances in which one may find himself. Nothing is entitled to be considered *best* which does not conform to natural law, the law of God, the positive law of the land, the conventional laws of society (so far as they are founded in reason and good sense), and to the decencies of life. To that best thing, and to that best manner, no one, perhaps, ever perfectly attains: but it cannot be doubted that there is some such standard. He who comes the nearest to it is he who is best entitled to entertain a respect for himself.

PRIDE.

There is a kind of pride which is often mistaken for *self-respect*. We hear of honourable and of a laudable pride. We take pride to be that self-esteem in which a man holds himself. It may be founded in his estimation

of the qualities of his mind, in his attainments, in his possessions, in his strength, his beauty, his parentage, and descent. It may also be founded in a consciousness of virtue, and of having faithfully done one's duty in all the relations of life. It seems to arise necessarily from comparing one's self with other persons. If this be the right meaning of pride, it is very clear that it is not always a sentiment which entitles one to respect himself. A man would be thought to be very unwise who should openly declare that he valued himself, in comparison with other men, on account of his wealth, his beauty, or his family connection; equally unwise, if he should declare his opinion of himself to be, that he was superior to other men in the gift of natural intellect, in the cultivation of it, or in the practice of the various virtues. The common sense of mankind, founded in natural reason, does not approve of that self-gratulation which rests on the accident of birth, of inheritance, or even on the acquisition of fortune by one's own industry; nor does it approve of that feeling, when founded on qualities which belong to the mind, nor even in the practice of the virtues, unless when manifested in a certain manner. There must be, in the very nature of things, some persons in every community, large or small, who are superior to others in these sources of self-esteem. In every city, town, and village, in this nation, there are some persons who are in possession of some of these causes of self-esteem in some comparative degree, and other persons who have the fewest or the least of them. Those who so use their advantages as to entitle themselves to the esteem of others, and who are acknowledged to be respectable for that use, may well be entitled to respect themselves from such causes. Those who use them in such a manner as to announce the feeling of superiority over others, and habitually to offend the watchful feeling of self-love, are properly called *the proud*. It is believed that these views conform to natural law, and to the necessary constitution of human society.

VANITY.

A still greater mistake is made in substituting vanity for self-respect. The word vanity is made out of two Latin words which signify *exceeding emptiness*. It is commonly understood to mean a strong desire to be noticed, considered, and esteemed by others, but on account of things rarely worthy of a rational mind. Vain persons covet praise. They thrust themselves, and all on which they value themselves, upon the notice of others. They delight in recounting their achievements, and sometimes make the sad blunder of speaking to those who know they are mistaken. They touch adroitly on their own excellencies, and provoke others to descant upon them. They have such delightful visions of self-complacency, that it seems cruel to disturb them. Such persons are very ready to become tools in the hands of more knowing persons. In general, the display of this poor passion is made by persons of very light and frivolous minds. It is seen at all ages, but strikingly in youth. To see a young person strutting or mincing along in a new garment, or in some personal ornament, and watching to see if he is noticed, and by whom, excites a feeling of pity and contempt. The same feeling arises when young persons are seen, who say in their movements, as intelligibly as though they spoke in plain English, "Do they not think me very handsome—elegantly dressed—a charming figure—most exceedingly graceful?" In some instances lookers-on do think so, and smile contemptuously at the same time. But, in general, lookers-on see no such thing as the vain imagine; they do see that which it would be shocking to those votaries of vanity to know is seen. They do see talents wasted, time misspent, foolish hopes, and vain desires. They do see that the purposes of life are misunderstood or perverted. Is there any remedy for these follies? None, probably, unless one would bring home to minds of the vain, that they violate the strongest precept laid down in the code of natural law for the government of persons individually and socially. That precept commands them so to conduct themselves in all things, as to entitle themselves to self-respect, and, consequently, to the respect of others. If the vain could conceive how small a portion they make of created being, how insignificant a part they make of civilized society, how many there are in that society, whose pretensions, if asserted, would be transcendently superior to their own, they might, perhaps, dismiss their little vanities, and devote themselves to gratifications worthy of their intended nature.

GRATITUDE AND INGRATITUDE.

If a destitute young person should attract the notice of a wealthy man, and should be by him supported, educated, and established in the world, so as to be able to live, to become independent and respectable, every one would say that this is a case for the feeling and the expression of fervent gratitude. Let us suppose that the patron of this young man frequently reminds him of his former condition, and by what means he finds himself where he is. Suppose the patron exacts a frequent acknowledgment of his bounty, and takes to himself unqualified praise for his goodness. Let us suppose that the obliged party finds his condition very irksome, and almost wishes that he had never been the subject of such burdensome favour, and is at length provoked to say so —*is he ungrateful?* It would seem, then, that gratitude had two sides to it, as well as two parties. He who has conferred a favour has not done all which it concerns him to do; and he who receives a favour may have a difficult task to perform. A bargain is an exchange of one thing for another, and the parties are even. The conferring of favours, whether these be asked for or not, seems to stand on very different grounds. Many elements make up that compound from which gratitude is said to arise. The parties may understand the nature of the favour very differently at the time when it is conferred, and more differently afterwards. He who confers, has a retentive memory; he who receives, a fading one: time regraves the favour deeper and deeper in the former, and wears it out more and more in the latter. In the former it often preserves the freshness of a new occurrence; in the latter the sense of favour often goes, and the weight of obligation alone remains. It may be that the complaints made against ungrateful persons are not always well founded, and that the expectations of those who confer favours are as little so. Some poet has written,

> He that's ungrateful has an only fault—
> All other crimes may pass for virtues in him.

The meaning of this couplet must be, that the members of society are under no obligations to confer favours, and that, if they do confer them, the party obliged is a monster if he do not—*what?* We know not what is intended, nor that there is any rule by which gratitude is to be manifested. We think that every member of society is to do what of good he can, and to whomsoever stands in need of it. He is not to stop to measure and calculate how he is to be paid for it. He may not be paid by the party benefited directly, but by some other, and in some other and unexpected way. Whosoever confers favours opens an account with the changes and chances and accidents of life. His credit side will look well in the close. If he confer a favour, he does it because he thinks he can and ought to do it. He has the *pleasure* of doing it. If he wishes to avoid the affliction of ingratitude, he has only to avoid letting the party obliged know, unnecessarily, whence the benefit comes. When a favour is done, the party conferring it takes on himself the duty of respecting that feeling of the human heart which is founded in reasonable self-love, and which is entitled

respect—that is, *not to ask one who has had the misfortune to be bound in chains, to clank them for the gratification of him who put them on.* There are cases of extreme ingratitude. They may have been occasioned by the irritating or indiscreet conduct of the party who was entitled to a different return. They are not of common occurrences. When they do occur, uncaused, the disappointed party may hope to find a better subject in his next essay.

SLANDER.

This is a twofold crime: 1. It is a breach of natural law, of divine law, and of the implied law of society, in relation to the party spoken of; 2. It is a breach of the same law, in relation to the party speaking. It has been commonly treated of in the first relation. It is now to be noticed in the second; and if it be shown why it is a breach in this, the other will take care of itself. We beg leave to ask a slanderer a few questions: Do you desire to be esteemed in society for your intelligence, your sense of justice, your knowledge of the decencies of life, and for the observance of them? If you happen to be ill-tempered, petulant, and disagreeable to your family connections and associates; if you make hasty and troublesome judgments, which you have to rescind or reform; if you happen to be ridiculous in your deportment, and remarkable for silly vanities; are you willing to have these things set forth in any, and every company, by any one who knows of them? Suppose there to be only some slight foundation for some one or more of these things, which, if you could have an opportunity to explain, would be entirely cleared up, are you willing to have that slight foundation made the basis of a structure of reproach, which, if true and real, ought to expel you from decent society? Suppose there to be no foundation at all for any such accusation of yourself, and yet somehow, and unaccountably, it is afloat and circulating, should you not think great injustice to be done to you? This is just what you do to others. You take away their good name, if they deserve to have one; you magnify their little faults and errors, and make them ridiculous or odious; you try them on indictments for serious offences, on which they have no opportunity to defend themselves, and of which they are ignorant. Where did you get your information? What credit were they entitled to from whom you had it? Did you understand them as they meant to be understood? Where and how did your informants learn what they communicated? Were they thoughtless or malicious slanderers like yourself? How much have you added to their slanders by way of recommending and making yourself agreeable? Have you broken any law by this conduct? We take the liberty to answer for you.

You have broken every law which an honest and honourable man, and a rational individual, should respect. 1. You have made every person whom you have spoken to, fear you and shun you. You have shown that you know not what the value of a good name is, and have forfeited your own, if you ever had any. You have shown that you are a stranger to self-respect; that you have probably every one of the faults, follies, and errors, which you impute to others; and desire to bring them down to your own level. Thus you have broken that law which commands you to do no evil to yourself. 2. You have violated that principle of natural law which commands you to do no injustice to your fellow-men. You know not what opinions you may entertain of the party you have slandered, if circumstances (as they may) should bring you into connection with him. You may find him to be, on a better knowledge of him, an amiable and worthy person. You may find all that you have said, and helped to circulate, utterly groundless. If he or one whom you occasionally meet, and even ask to partake of your hospitality, how can you meet him, and manifest towards him every sentiment of respect and esteem, when you have so spoken of him? One of two things must be true: either you *act a lie*, when you meet him in such a manner; or you *spoke a lie*, when you represented him as you did to others. 3. You have broken the law of God. To this law, perhaps, you are a stranger, and know not what wrong you have done. If so, the kindest thing that any one can do you is, to urge you to find out what it is, and to learn there the sentence of the slanderer.

It may be asked, whether one is to be entirely silent at all times, and on all occasions, as to the character and conduct of others? Certainly not. There are many occasions for speaking of others, and for speaking the *truth* of them, whatever that may be. All the members of any community are interested in knowing the true character of each other. The knowledge that this character may be known, is one of the most salutary correctives of erroneous conduct, and one of the strongest inducements to pursue that which is commendable. It is probably the case, that the members of every community are pretty well understood by all who have an interest in knowing them. We know not of any law which holds it to be immoral *to speak the truth of any one from good motives, and for justifiable ends.* It is all-important that this principle should prevail in our country, where so much depends on public opinion. Surely one's arms are not to be folded, and his lips closed, when he sees one bent on mischief, public or private. It may be one of the highest moral duties to declare what men are, and what they are aiming at, in many supposable cases. There can be no surer guide than the *motive* and the *end*. Inquiries are sometimes made, in matters of greater or less interest, concerning others, confidentially, and where the inquirer needs to be truly informed. The party inquired of has a right to be silent, if he thinks he has good reason to be so; but if he answer, he is bound to state the truth. If he choose to speak, and wilfully conceal the truth, so that the inquirer is deceived, he subjects himself to the imputation of an intentional deceiver.

There may be also, and there frequently are, confidential discussions of character, especially concerning public men, and where perhaps there is no particular end in view. This does not seem to be wrong; such intercourse is not founded in malicious or unworthy motives. It is even sometimes instructive and philosophical. This, perhaps, is the extreme limit. In all other imaginable cases, it is probably most consistent with one's own self-respect, and all truly respectable motives, to let other persons alone, and leave to them the care of their own characters.

PROFANITY.

Excepting the high crimes which are punishable by the public laws, there is no one so shocking as *profanity*, nor any one which there is so little inducement to commit. Profane swearing is of two kinds: 1. That in which the Deity is called on to do the pleasure of a sinning mortal; 2. That in which the Deity is called on to witness the truth of such a being's thoughtless or wicked declarations. This common practice can be accounted for chiefly on two grounds: 1. Pitiable ignorance; 2. Abominable wickedness. On the first ground, surely the profane swearer must be ignorant of the import of the terms which he uses. If he did understand his own words, he would be struck with horror. Surely, if there be any escape for the profane from that condemnation which they impreeate on others, it must be, that mercy will be extended to them in compassion for their ignorance. On the other hand, if they are not ignorant, but do knowingly and wilfully so misuse the gift of an immortal mind, and that unquestionable proof of Divine power and goodness, *the ability to speak*, they cause to

subjects of moral instruction. They should be left, like the consumers of alcohol and tobacco, to shock and to warn others.

Swearing, which formerly pervaded every rank of society, is now to be chiefly found in a very low and uninstructed class: it is, in fact, a vulgar and proscribed mode of speech. Nevertheless, it is still used occasionally by persons of no humble rank, especially by the young, though chiefly for the purpose of giving an emphasis to speech, or perhaps simply to give token of a redundancy of spirits, and a high state of excitement. To those who are guilty of it for these reasons, it is only necessary to point out, that no well-informed person can be at the least loss, with the genuine words of the English language, to express all legitimate ideas and feelings, and that to use either profane or slang words, is, at the very least, the indication of a low taste and an inferior understanding. A direct, pure, manly use of our native language, is an object which all may cultivate in a greater or less degree; and we have invariably observed, through life, that the most virtuous persons are the most exempt from the use of mean and ridiculous phraseology, and monkey tricks of all kinds.

Does not one who is habitually profane, necessarily entertain a low opinion of himself? Would any respectable merchant, or mechanic, or farmer, receive into his service a youth whom he knew to be a profane swearer? Could any one who is known to be such, find admission into any school, academy, seminary, or college? Would any respectable parent admit such an one to be a companion of his children, or a visitant in his family? Would not every reasoning person say, that a youth who is so ignorant as not to know that swearing is a violation of natural and divine law, must be ignorant enough not to know that there are many other laws for the proper government of society, and consequently that he is an unsafe person to be trusted? If the profanity be the consequence of voluntary wickedness, then surely all reflecting persons would say, that he who is wicked in this respect, is indeed wicked; but then he will be wicked in others also. For, as there is one chain which runs through all the virtues, and binds them in a sympathetic union, so also is there a chain which unites all the vices. He who swears, may be justly suspected of drinking; he who swears and drinks, may be justly suspected of gaming; he who swears, and drinks, and games, must keep very bad company by day and by night. He who keeps such company from such motives, must squander his own property, or steal that of somebody else to expend. He who robs another will commit forgery, and he who is so desperate as to commit these two latter crimes, will not hesitate long to put a human being out of the way of his pressing wants, if he is tempted to do it. It is probable that habitual lying and swearing are the first steps in that mournful series of crimes, and the first beginnings in the course of deplorable wretchedness, which deform and disgrace human society. Will any one maintain that these are necessary evils, and that God has so made man that they cannot be prevented? Surely these are evils wholly of human origin; and where they begin, there lies the power to extirpate them.

ENVY.

It is to be kept in view, that the main object is to show that this is a good sort of existence, if man knew how to use it, and that he is the author of his own afflictions. This is remarkably illustrated in the matter of *envy*. It is probable that a large proportion of mankind, in all classes, suffer from the dominion of this passion. It can be shown that it is peculiarly the passion which man has made for himself out of emulation, which latter is the Creator's work. In this instance, man has been wonderfully ingenious and successful in making himself miserable. He has done worse; he has provided for himself, in creating envy, a fountain which sends forth not one water, but many, and each one foul and poisonous. He who has submitted himself to envy has bound himself to think, to feel, and to act, as envy prompts. It would be most shocking to know what agency this monster has had in human affairs. If any one should read history, and watch the movements of his fellow-men, merely to learn the operation of this principle of action, he would see, probably, the most operative cause of the misery which men inflict upon themselves and on each other. If one has not time to read history, and watch his fellow-men, he may perhaps learn much of what he would find in these authorities, by reading his *own heart*.

The word envy comes from two Latin words, *in* and *video*, and signifies *looking against*. It arises from perceiving, in other persons, qualities which one's own self-love leads him to wish to have—as beauty, strength, grace, learning, eloquence, power, &c. It extends to riches, to office, to distinction, to the respect and esteem in which one is held by his fellow-men, and even to birth and ancestry. It makes one *sorry* that he has not these good things, and makes him *angry* that others have them. One easily persuades himself that great injustice is done to him, in that *he* has them not. The next step is to *hate* him who has them. Then comes the desire to deprive the supposed fortunate possessor of the benefit of them. But to admit that one has these malignant promptings, is contrary to another principle of self-love; and therefore no man tells another of his own envy, and he tries to wrap it up from his own view. As he cannot and dare not openly manifest that he is envious, he must obey the suggestions of malice in the dark. He therefore intrigues, insinuates, and becomes adroit in putting one thing for another; he secretly and by covert means undermines the object of his hatred. He whispers his doubts, suspicions, opinions, and belief. If the tenure of the hated object is too strong to be shaken, then the bad uses which he makes of his advantages are sought out. The base accompaniments of his fine qualities are brought forth, and placed in the strongest light. "She is beautiful; *but* she is vain, haughty, and silly. He is rich; *but* he got his wealth by frauds, and hoards it like a miser. He is able, eloquent, and popular; *but* he is selfish and insincere, and would put a yoke on every neck in the country if he could. He is making a great flourish in the world; *but* it is all false and hollow—he came from nothing, and will go back to nothing." It may be easily inferred that one who has surrendered himself to the dominion of envy, not only deprives himself of the profitable use of what he has or might have, but makes himself wretched in contemplating what he must know he cannot have: he is so wrought upon, that whatsoever seeds of crime he may have in his heart, are sure to start into luxuriant growth.

Can any rational being doubt that this sort of suffering and crime is entirely of man's making? Can it be doubted that he can prevent them? These are violations of natural law and Divine law; and no law comes from this source which cannot be understood and obeyed. Let us take an example, and seek out the unreasonableness and immorality of envy; and to do this effectually, we must take a strong case, and in some degree a fanciful one. Let us suppose that in a seminary of females there is one who is very beautiful; her parents are very rich, and are highly respectable; and that this young lady is distinguished by her genius, and her diligence and good conduct, and is obviously in the receipt of the preceptor's unqualified approbation. Let us further suppose that there are some of her school-fellows who envy her. Their countenances show what they feel. Every mark of favour manifested to this fortunate person is a blow on every envious heart. Discontent, distress, and

malignity, take up their abodes in these hearts, and enter into thriving partnership. But the beauty, the genius, the diligence, the wealth, the parentage, the applause, are not among the dividends which these partners make: these remain where they were: and what dividends do they make? Let us suppose that the envious would do what they would; that is, annihilate the envied qualities, and make the possessor too low and contemptible to be more thought of; and let us suppose, too, that the successful adventurers succeed to what is now the first eminence—Is there no one below to pull them down? They are soon down, and by like means; and thus the demolition would descend, until the seminary became too low a place for even envy to find something to live on.

Is not this a fair example of what we continually see in all grades and classes of social life? and is not this passion of envy, earth-born, mischievous, and odious? What is the remedy? Common sense and plain reason point out the remedy. Generally speaking, every member in society is just as much in his own place as he is in his own skin. No one can be in another's place. Every one has his place originally assigned to him, and his natural condition in it, by means over which he had no control, and in making which he had no agency. What he will make out of himself, and of the circumstances in which he finds himself (must depend (after the irresponsible state of infancy is passed) on his own thoughts, motives, and acts. He will find his greatest good, not in repining at the good of others (which he can never make to be his own, and which he cannot destroy without expecting retributive justice as to himself), but in making his own condition as good as he can, consistently with self-respect and peace of mind. That which is given to others, and all that they can lawfully acquire, is rightly only their own. All that is given to one's self, and all that he so acquires, is in like manner his own. If he would have no injustice done to him by those who are below him, he must do no injustice to those who are above him. We entertain no doubt that the day will come when youth will be so instructed, and men so self-disciplined, as to know that the laws of nature, and the laws of society when conformable to these, permit to every person a proper place, enjoin duties in that place, and ensure happiness from the performance of those duties. When that day comes, envy will die.

EMULATION.

This has been sometimes classed with envy, but they have nothing in common. One would feel like a culprit in being known to be envious, but would rightly take praise to himself in being emulous. This motive to action was given to man for the best possible purposes; and upon the application of it, with justifiable views, and to commendable ends, the advancement of human welfare mainly depends. You understand it to mean, the desire to obtain excellence in laudable pursuits. An envious man may be supposed to say, "Your eminence distresses me; I cannot bear to see you sitting up there; and though I have not the shadow of hope that I can ascend to your place, if you were out of it, nevertheless I must pull you down if I can, and then we shall stand on the same level." An emulous man may be supposed to say, "I admit that you are where you should be. You have raised yourself by fair and just means. I have no desire to disturb you, nor to impede your further progress. You have done me no injustice; on the contrary, you have rendered me the important service of showing me how one may honourably rise. I shall follow your example, and endeavour to place myself by your side. If I can get there, we shall have a fair, good-tempered rivalry, and we may animate and quicken each other's efforts. If you are able to keep always in advance of me, you will make me diligent, and enable me to excel others, if I cannot equal you." There seems to be nothing immoral in this. In this view, emulation is presented in its true and amiable character. Like every thing else intrusted to man's use, it may be, and often is, perverted. It frequently excites very unworthy feelings. Hence it has been confounded with envy. It is upon the principle of emulation that diligence in schools is commonly founded; and it is in schools that the perversion alluded to is frequently noticed. When several children are required to get and recite the same lesson, there must be a best and a worst among them. That they are such respectively, may depend on natural talent, and upon industry, or on both. It deserves great consideration, whether rewards and punishments are generally understood in their true philosophy. There must be emulation in schools; because there is, and ought to be, that stimulant everywhere in all the vocations of life. If men had not the advantage of comparing themselves with each other, and the promptings to exertion which arise from that comparison, this life would be very still and stupid. But what use is to be made of this principle in schools? is a question of exceeding interest. We express no opinion on this point, because we might not express a sound one, and might thereby do some injury, and very possibly no good in any case. Add to this, that such an inquiry does not come within our general object.

PEACE OF MIND.

It is believed that most persons pass a large portion of their lives in a state of inquietude and uneasiness. Persons who have no bodily disease are anxious and disturbed. They have some urgent want which cannot be gratified, or which cannot be so without incurring some evil which would be worse than the unsatisfied want. They have the dread of some probable or possible evil to come, and which is the more terrible because of the uncertainty of the manner and of the time in which it may come. Others are uneasy from remembering the past, in which some benefit was not secured, some blunder made, some wrong done to themselves, some vain gratification not obtained. There are many persons who are habitually discontented. They find every thing goes wrong. The weather is bad; their food is not as they would have it; no one does any thing in the right time, or right manner; or that is done which should not be, or that is omitted which should be done. Such persons are always groaning, sighing, or grumbling. They dislike everybody, and everybody dislikes them; and particularly, their abundant *advice* is disliked, and their manner of giving it. There are other persons who are of unquiet mind for more serious causes. They have recollections which distress or torment them. They are transgressors; perhaps criminally so. They have been able to conceal this, but they live in the fear of disclosure; at any rate, the fact cannot be hidden from themselves.

These are frightful instances of the agency of this companion which every man has in his own bosom. There are hours in every one's life, when he must compare the condition in which he is, with that in which he thinks he might have been. To some persons, these are hours of dread and terror. It is believed that this cause of suffering is purely of human origin, and that prevention must be found where the error began. It is the law of the Deity that there shall be such suffering when the guilty mortal makes it necessary to apply that law. There are great differences in the temperament and natural dispositions of persons. It is incredible that the worst-tempered persons would not make a better whole of life, by suppressing their natural propensities, and acquiring a control over themselves, and teaching themselves to look out for what may be pleasant and agreeable, (passing by that which seems ill to them,) instead of doing exactly the reverse.

There are cases in life in which it is said, there must

be anxiety and inquietude, from the very condition in which men are placed: persons who sustain public offices, persons who are placed in important trusts, persons whose vocations are perilous, those who are pricked by the thorn of political ambition. It is probable that such persons do experience many painful and distressing emotions, and that they sometimes pay dearly for their distinction; but it is demonstrable that even such persons might have tranquillity, if they had a right frame of mind. There are persons who substitute an aching solicitude for the reasonable discretion and care which is all that is required in the performance of duty. There are others who greatly overvalue the distinctions to which they attain or aspire; and very few of them reflect, that, when they do succeed, they must take success, especially in popular governments, with the accompaniments of having their worthy acts misunderstood and reproached, and their mistaken ones magnified and distorted, to suit the occasions of adversaries.

The remedy for this sort of suffering is within every one's power. Those who are poor, and in humble life, if not in extreme poverty, may possess peace of mind; and it is of easier acquisition by these than by those who are involved in the duties of office, and the responsibility of trust, and the embarrasement of wealth. Certainly, without this treasure, no earthly grandeur, no promise of posthumous glory, is worth having or seeking for. If the laws of nature, and the teaching of revelation, were properly known, respected, and obeyed, the common causes of inquietude would hardly be known. For example, what is more common than complaints of the weather? It is too hot or cold, wet or dry. It is not nature that mistakes about the weather, but ourselves. The movements of the winds and the waters, and the temperament of both, proceed on some great and universal laws, far beyond human perception. That which is exacted of us to believe is, that it is so, and to adapt ourselves to it, by our experience and ingenuity. What sort of effect would it produce in the earth, if such things were regulated by human perception of what is best? When one has occasion to put to use a board or stick of timber, which has been in contact with the ground for a certain length of time, he disturbs and puts to flight families, communities, and whole nations of living beings. Man may be much in the same relation as to general laws (not meant for him to comprehend) in which these insects are on the removal of their covering.

As to all causes of inquietude arising from the operation of nature's law, in which human agency has no concern, they must be right, although they occasion inconvenience to individuals. As to the acts and omissions of others which affect us, some questions are to be asked and answered before one can rightly judge of these; namely—What is the real cause of our complaint? Did not the first fault arise from some act or omission of our own? Do we judge reasonably of the supposed wrong? Do we make charitable allowance for the misapprehension which may affect the party complained of? When the inquietude arises from our own wayward and peevish disposition, from our own misconduct, negligence, or breach of laws, which we could know if we would, the remedy lies in becoming wiser and better, and more reasonable in learning how we may make of life that which it was intended to be, when we use it as we should. Let any reasonable being look back on his own life, and calmly consider the causes of his own contentions, ill-will, and sufferings, in body and mind; how many of these can he fairly lay to the blame of the Creator's laws, of nature's laws, or those of society, whether positive or implied? If to these he can charge but very few, who but himself is there to take the residue?

We have been trying to show what peace of mind is not. We have to show what it is, or rather, in what it is founded. It comes from sober conviction that the Creator has made his own laws for his own universe; that he requires conformity to these laws; that he permits and enjoins the use of what is good and right; that he punishes all that is wrong and disobedient. He has trusted every mortal with his own welfare, but has associated with him others who live in the same trust, each one for his own, but yet for mutual welfare. All are to contribute their common efforts to the common good. Those who have the means are to aid others in acquiring a knowledge of the laws which are common to all. If these laws were understood and applied, how abundantly would peace of mind increase in the world! The school boy would get his lessons and obey his preceptor; the labouring classes would labour diligently, live temperately, and find a greater pleasure in their frugal food than the luxurious in their festivals; for the former live as nature orders, the latter as fashion dictates. The opulent and luxurious would learn that the accidents of their fortune do not exempt them from the laws of nature; that if they have affluence beyond their reasonable and commendable wants, they are blessed with the means of purchasing a precious name; they would learn that no wealth will exempt any man from earning an appetite for his pleasure by physical motion; that, if he is tired of being rich and happy, *he must work* to accomplish some reasonable purpose. His distinction is, that he may choose the means in which he will expend *to be busy*, while others can only work in some prescribed mode *to live*.

The middle classes, and all who are not dependently poor, have as many and as valuable sources of enjoyment as those have whom they think to be better off than themselves. They can love and be loved; they can be respected and esteemed; they can have the consciousness of behaving well, where their lot has been cast; they have a far keener zest for natural and reasonable pleasure than those who misuse the bounties of accidental condition; they can have peace of mind when it is denied to those whom they deem more fortunate. If these natural laws, which seem to be so plain and obvious, were understood and respected, the labourers *in mind*, in all their varied employments, would do diligently, and in the best manner in their power, that which they have undertaken. Men of public trust would do honestly, and with a single view to their trust, that which they have undertaken. Suppose it were all so, and yet troubles and disappointments come. This may be, and yet there would be peace of mind. If every one were assured that no act, no omission of his own, makes him suffer, that he has acted faithfully and honestly, and to the best of his ability, in the circumstances in which he was placed, he would be entitled to have, and by the law of immutable justice, he would have, *peace of mind*.

HAPPINESS.

There is no word in our language more commonly used, nor any one less defined or less understood. It is sometimes taken to mean pleasurable sensations derived through the senses; sometimes it means a peculiar state of mind. It may be said that a pirate who has been brought to the most perfect penitence, and who is sensible that he has forfeited his life to the demands of justice, and that he is about to be transferred from the perplexities and sufferings of this state of being to endless felicity, is *happy* that he is going to be *hanged*. Perhaps it is easier to tell what happiness is not, than what it is. The most perfect *health* is not happiness, unless one has something to do. Health and *riches* do not make one happy. These accidents of being rather excite cravings for enjoyment. They are means, not ends. A rich man can ride but one horse, or sit but in one coach, or eat but one dinner, or wear but one suit of garments, or live but in one house, at a time. Persons in moderate circumstances can do the same.

Health, riches, *power*, and *distinction*, do not make happiness. Distinction is troublesome: it has more pains than pleasures; it is jealous, envious, and distrustful. Power does not make one happy; it demands the most busy watchfulness to keep it. If lost, its absence is often followed by painful suffering, and the possession of it is always accompanied with the fear of losing it. Riches are sometimes regarded as means of enabling one to live in elegant luxury, and even in voluptuous enjoyment. This is no way to be happy; the appetites soon become satiated; the stomach wears out; the senses are palled; diseases come: the body may be racked on a velvet couch as well as on a straw bed. Is there, then, any such thing as happiness? There must be such a thing, or the laws of nature, which provide for physical intellectual, and moral being, are false and deceitful, and the gift of revelation is a fable. If there be such a thing as happiness, it will be found in that knowledge of and obedience to the laws of nature which make health. It will be found in obeying the propensity to action, to some continuous, useful end; that is, in pursuing reasonably some one of the many vocations in society which tend to secure one's own self-respect and peace of mind, and which tend also to the common good. But there may be disappointments, ill luck, and causes of mortification and sorrow. These, we apprehend, do not seriously disturb any well-regulated mind, when there is a consciousness that no reasonable foresight or prudence would have discerned and prevented the cause. Perfect happiness in this world, it must ever be remembered, is not to be expected: the only happiness that we can really attain, consists in a certain contented tranquillity of mind under all the shocks and changes of this mortal life. There is a point called the *happy medium;* and this should be an aim in all human arrangements. Be moderate in all things. For example, to take no amusement is bad, for it deprives the mind of needful rest and recreation; so likewise it is bad to be altogether given up to amusement, for then all serious objects are lost sight of. The true plan is to take amusement in moderation. Some minds have never awakened to a taste for poetry, fiction, the imitative arts, and music, and they thus lose much pleasure which others enjoy: again, there are some in whom nature has implanted, and use cultivated, so strong a predilection for these things, that it becomes a vice. To be very much in society is sure to deteriorate the human character, making it frivolous, and incapacitating it for taking abstract and elevated views: on the other hand, a perfectly solitary life weakens the mind, lays it open to odd fancies and eccentricities, if not to hypochondria, and ends in some instances by altogether throwing it from its balance. The medium is here also found alone salutary. To be excessively gay, in a world where so many evils lurk around our every step, and so many onerous things call for our attention, is wrong: so is it to be always serious, seeing that the world also contains the materials of much happiness. What is proper is, that we should be ready to rejoice and mourn in moderation on the appropriate occasions. Finally, one may feel assured, that if he abide by these moderate desires, and so use his time as to be reasonably busy to some good purpose, and so conduct himself as to be justly entitled to his own approbation, and if he live in the habitual assurance that there is an omnipresent, omniscient, and merciful Judge of moral, accountable, and immortal man, he will certainly be happy.

NOTE.—The matter of this sheet has been extracted, with a few slight alterations, from the Moral Class-Book of Mr. William Sullivan, published a few years ago at Boston, in the United States. Of the excellence of purpose, firmness and expressiveness of language, profound observation, and amiable sentiment, displayed in this book, we need hardly speak, after presenting the reader with such ample materials for forming a judgment of his own. It is impossible, however, to omit the opportunity of congratulating our brethren on both sides of the Atlantic—for we never can consider them but as one nation—on the rise, in America, of a body of moral writers, of whom Mr. Sullivan is but a specimen, who seem resolved, as they are unquestionably able, to seek the improvement of their fellow-creatures in all that tends to elevate them in the scale of being. The present sheet contains Mr. Sullivan's view of the Duties which one owes to Himself: another, which follows, will comprehend the Duties which one owes to Others as classified in the opening paragraph.

PUBLIC AND SOCIAL DUTIES OF LIFE.

The preceding article upon this subject embraced the duties which one owes to himself as a rational being. The present is not less important in its character, being intended to point out those duties which we are required to perform with respect to our various public and domestic relations. We begin with our

DUTIES AS SUBJECTS.

Every civilized nation is governed by some species of authority, for the purpose of preserving order in society. Some governments are good, others are bad; but it does not fall within our province to point out where the ruling authority is injurious, or where it is most advantageous to the people. According to a law of universal application, every independent nation is understood to have the undoubted right to model its government according to its own fancy, genius, or necessities, provided that, in the execution of its plans, it does not wantonly injure its neighbours. Directing our attention to our own country, with which we have here alone to do, we find, as soon as reason dawns upon us in youth, that we are members of a great and enlightened community. We find ourselves subject to laws which were framed long before we were born, and that we must act in a manner not to please our own caprice, but according to the arrangements which have been instituted for the benefit of society at large. But if we thus discover that we are trammelled by certain legal restrictions, not very agreeable, perhaps, to the wildness of our untamed nature, we likewise find that we possess a great many compensating privileges. While yet opening our eyes to the light, we enter into the enjoyment of all the transcendent privileges of British subjects, and come within the powerful protection of the laws as fully as the oldest and most honoured in the land. It will be perceived that this is a boon of incalculable value. For us, armies have fought and bled; for us, in past time, hosts of martyrs and patriots have contended; for us, the wisest statesmen and legislators have transacted negotiations securing civil liberty; for us, the people who have gone

before us have established a variety of the most excellent, the most beneficent, institutions. All these things we enjoy without having been put to the smallest trouble. All that we are called on to give in return, as soon as emancipated from the ignorance of childhood, is *obedience to the laws.*

A cheerful obedience to the laws is, therefore, our chief public duty. Possibly some of our laws, from having been framed for a former state of society, or in order to meet particular exigencies, may not now be very judicious in their provisions; yet that forms no solid reason why we should break through them. It is always safer to obey a bad law than to oppose it by violence. Unhappily for some nations, they seem to have no accurate idea of the value of obedience to the laws. When they find themselves aggrieved by oppressive state measures, they are exceedingly apt to break into tumults, and take up arms against the officers of their governments. This is a very short-sighted policy, as the history of all nations proves; for the people are always sure to suffer far more by the coercive measures adopted to restrain them than they would have done by submitting to the evil they originally complained of. It is the boast and glory of Britain—and long may it be so—that its people know how to respect the laws, even while they consider them to be injurious, and how to correct them by quiet and orderly procedure. In this lies the important secret of their national greatness, their wealth, their public liberty. The advantages arising out of a scrupulous obedience to the laws, consist, in the first place, of social order and quietude, by which the rights of property are respected, commerce and trade permitted to flourish, and the sacred inviolability of the person preserved. The results of turbulence and civil commotion are, poverty, ruin to property, insecurity of the person, destruction of commerce and trade, and, at length, military oppression and barbarism. Every intelligent man, therefore, in this country, yields not only a bare submission but a becoming respect to the laws, as well as to the various institutions established by their authority.

Perfect obedience both to the letter and the spirit of the laws, does not, however, imply that we should not examine whether they are in every respect answerable to the present condition of society, nor keep us from resorting to legal means to have them corrected, or altogether rescinded. The constitution points out how this is to be done. It is illegal to conspire secretly to overthrow the law. All measures calculated to improve our social condition must be conducted openly and honourably. The means put into our hands by the constitution for improving the law are very powerful, if wielded with discretion. The people have the appointment of the men who constitute the most influential branch of the legislature; if they do not appoint individuals who will meet their views with regard to correcting or abolishing laws, they have themselves to blame: the constitution confers upon them a liberty of choice. It besides gives them the right to present petitions to the legislature, either individually or in bodies, praying in respectful terms for the amendment or abolition of any law which is deemed oppressive or antiquated. This right gives a vast addition to the power of the people. It is of much greater value than one would at first be inclined to suppose, and is infinitely preferable to the use of violence. The right of petition implies the right of meeting publicly to discuss the propriety of petitioning. This practice of meeting together excites the public mind to renewed efforts in the cause it undertakes. The speeches of the orators are circulated and commented upon by the newspapers all over the country. One meeting gives rise to others, men's minds are enlightened and warmed, and the public opinion acquires a degree of moral force, any resistance to which would be useless. It is not without reason, therefore, that the people of this country set so high a value on the right to assemble for the discussion of public affairs, and place it in the first rank of their constitutional prerogatives.

Besides yielding obedience to the existing laws, we are under a collateral obligation to be loyal to the sovereign who rules over us. Loyalty is hence another of our chief public duties. There is some difference of opinion with regard to what extent loyalty ought to be carried. It appears to us that this is a simple matter. A power to protect the nation from foreign insult, and to preserve the internal peace of the country, *must be lodged somewhere.* It is found to be most convenient to lodge it in the hands of one person, under proper restrictions. In Great Britain, as will be seen in our history of that country, it has been placed in the possession of a hereditary prince or king. This person is entitled our ruler or sovereign; we are termed his subjects. Loyalty signifies a fidelity and willingness in serving the king, so that he may be enabled both to protect the nation from outward harm, and to preserve order in society, through the agency of the laws, or, failing them, through the application of force. Seeing that the sovereign is prevented by the constitution from infringing upon the rights of the subject, through the exercise of his power, it is discovered that loyalty is rewarded in the comfort we enjoy; or, to use another expression, self-interest alone, if no nobler sentiment interfere, would lead us to afford assistance to the king in the execution of his high and important trust. This assistance is demonstrated, not only by personal service, if necessary, but by respect. Loyalty may be greatly enhanced by esteem for the private virtues and conduct of the sovereign. When so influenced, it is certainly both an amiable and commendable feeling, and can never, but in ill-regulated minds, degenerate into servile prostration.

In the United States of America, in which the executive is lodged in an elective president, the people call themselves citizens, not subjects; and what we mean by loyalty to the sovereign, they term duty to the commonwealth. It is obvious that there is extremely little essential difference, *practically*, between these phrases, whatever there may be in *feeling*. The subjects of Great Britain are as free as any people in the civilized world; much freer, indeed, than the inhabitants of France, who disclaim the appellation of *subjects*. These explanations are perhaps useful in admonishing us to beware how we vex ourselves about mere words and sounds. Our duty clearly consists in appreciating the numerous blessings we enjoy in our public and private relations, by whatever name these relations may be called. We are each individually fractional parts of a great nation, whose honour we are called on to sustain through good and bad report. Let us remember that individual virtue can alone promote social happiness, and that social happiness and peace form the bias of political independence. No man can be a good and respectable subject or citizen who is a bad son, a bad husband, a bad father, or a bad master. The nation is but a composition of a great many families, knit together by kindred sentiments and mutual wants; and how can it be great, or worthy of esteem, if its component parts exhibit in their constitution the worst of vices?

Loyalty to the sovereign leads to a subordinate but important duty. It induces us to respect inferior constituted authorities. All judges, magistrates, or other civil functionaries, stand in the light of representatives of the sovereign. The king cannot be everywhere at once, and he deputes these individuals to attend to the wants of his subjects, and to keep good order in society. To show contempt for any court of justice, or for any magistrate, is, therefore, equivalent to showing contempt for the king himself, as well as for the laws, and is justly punishable. To show our respect both for the laws and the sovereign, we must respect the decisions of judges

and magistrates, and support their due execution by our personal influence. Nevertheless, it is in every one's power, when they feel themselves aggrieved by these decisions, to appeal to higher authorities for redress; such being the only means allowable by the constitution, in opposing the legal power of the established courts of civil and criminal jurisprudence.

A becoming obedience to the laws, and a generous respect for the supreme and inferior constituted authorities, produces the agreeable result of good order and peace in society. Every one is not acquainted with the different ramifications of the common and statute law; indeed it would be impossible for us to acquire a correct knowledge of these things unless we devoted a lifetime to the study. This difficulty in acquiring a knowledge of the laws has sometimes given rise to a low sort of jeering at our excellent constitution, and it has been represented as cruel to compel an obedience to laws which few can have an opportunity of learning. But this is a fallacy into which we hope our young readers will not fall. The administration of the common law, such as that which applies to inheritance, debtor and creditor, and civil rights generally, rests with a body of educated men, or lawyers, whose services may at all times be commanded. Besides, we may, if we please, purchase digests of these laws for our private amusement and instruction. The other description of law which is made applicable to the preservation of the peace of society, any one can understand, if we have the ability to know right from wrong. We surely all know that it is illegal and criminal to steal, to rob, to murder, to break into our neighbours' houses, or to attack their persons by violence. It can require no reading of acts of Parliament to understand this. Common sense here serves us instead of legal knowledge.* Our duty in this matter is very easily defined. We must ever bear in mind that one of the principal acts of duty which the constitution enforces, is the abstaining from meddling violently with the persons and property of our fellow-subjects. In this well-regulated realm, the person of every man, woman, and child, is inviolable from private attack. It is a crime almost punishable with the highest penalty of the law, to strike any one, either from an idea that they have injured us, or through the influence of passion or prejudice. If we consider that we have been injured, we must apply to the law or the magisterial authorities for redress. We are only permitted to use physical force when in absolute danger of losing our lives or property by violence, there being then no time to apply to the law for protection. It would be gratifying if these regulations were more generally attended to than they seem to be. There are many young men, who, from what they are pleased to term a love of fun, but which can be no other sentiment than a love of mischief, or gross ignorance, assail the persons of individuals of both sexes, to their great discomfort, and sometimes serious injury. Now it is clearly illegal to do so, and is generally punished by the infliction of severe penalties by the civil magistrates, though seldom marked with that ignominy which it deserves. Inasmuch as it is held that ignorance of the law does not excuse its infraction, so it is reckoned an invalid apology for the commission of crime to say that you were under the influence of intoxication at the time. Drunkenness is very properly esteemed an aggravation, not a palliation of the offence.

CONDUCT AT PUBLIC MEETINGS.

The right of meeting together publicly to discuss matters connected with our social condition, being so invaluable a prerogative, it is right and fitting that all young men entering into the busy scenes of life should make themselves well acquainted with the rules which have been established by general consent for the proper conducting of such assemblages.

According to usage, a public meeting is not constituted until a person be appointed to preside, or to "take the chair." Without this ceremony, the meeting is a tumultuary assembly, or a mob. The first movement is, therefore, the appointment of a chairman. This functionary, on taking his seat, is for the time supreme in the meeting. His chief duty is the preservation of order. He allows only one to speak at a time, giving the preference to him who has first caught his eye in the act of rising, and giving every speaker a fair hearing. Another of his chief duties is the preventing of speakers from wandering from the subject under discussion; and if they do, he must remind them to keep to the point. In the execution of these and other duties, he claims the support of the meeting, and all are bound to yield to his reasonable dictates, and help to maintain his authority. In proportion to the firmness, yet mildness of manner, of the chairman, so is the meeting well or ill conducted.

At some public meetings there is no set plan of operations, and a general discussion on the subjects which are brought forward takes place; but at all meetings for specific important objects, there is a previous arrangement among a certain number of individuals to bring forward particular points to be spoken upon. In this case speakers are prepared, and the business assumes the form of the proposal and carrying of a set of resolutions, or motions. The following is the routine of procedure:—The chairman having stated the object for which the meeting has been called, an individual steps forward and proposes a resolution for the adoption of the meeting. Whether he enforces the propriety of carrying such a resolution by a speech on its merits, or simply propounds the matter, he must be *seconded* by another individual (with or without a speech), otherwise the meeting cannot entertain his resolution for a moment. If duly seconded, then the motion is fairly tabled. It is before the meeting. After a resolution is proposed and seconded, it is the duty of the chairman to ask the meeting if it be carried or not; if agreed to by a general acclamation, or by an obvious majority, he pronounces the word "carried," which settles the point, and the business proceeds by the bringing forward of the other resolutions in the same manner. It is unusual for any member of a meeting to oppose the passing of a resolution, unless he have a better to offer in its stead. If he have, and if he wishes "to take the sense of the meeting" on the subject, he has a right to be heard. Yet this can only be permitted, provided the meeting has been called in general terms. For instance, if the inhabitants of a town or district generally be called, in order to consider of the propriety of such and such measures, in that case every one is entitled to give his opinion, and to oppose the formal resolutions brought forward. But if the meeting be described by advertisement to consist of those inhabitants or others only who agree in the propriety of such and such measures, then no one is entitled to intrude himself on the deliberations who professes opinions contrary to the spirit and end of the meeting. An inattention to this exceedingly delicate point often creates serious heart-burnings and disturbances; and, on that account, committees who call public meetings ought to be very particular in the terms of their announcements.

As much regularity is necessary in respect of opposition to motions as in their proposal and carrying. The counter-motion of an opponent is called an amendment, which, to be available, must also be seconded. If not seconded, it drops; but the opposer may place his protest on record; that is to say, if the discussion be in a corporation, or other meeting where books of the minutes

* At the same time, we willingly allow that there is room for great improvement in the dissemination of a knowledge of the statute law, particularly that of a recent date. It is likely that some plan will soon be carried into execution to remedy this defect.

transactions are kept. On being seconded, and discussed by those who wish to speak upon the subject, the matter is brought to the vote by the chairman, but not until both the mover and amender have replied, if they please to do so. After they have spoken, not another word can be uttered, and the vote is taken, a majority carrying. If the votes be equal in number, the casting-vote of the chairman carries. There is another way of suppressing a resolution, which is by "moving the previous question." This signifies, to return to the point at which the business of the meeting stood previous to the tabling of the motion; or means, in other words, to do nothing on the subject. But this must also be seconded, and put to the vote in opposition either to the motion or amendment, or to both. The routine is generally to place it in opposition to both; if carried, the matter is settled; if not carried, the order is next to place the motion and amendment against each other, and vote.

Such is an outline of the mode of procedure at public meetings, and it is particularly desirable that attention should be shown to the preservation of regularity. At all public meetings there is a strong tendency "to go out of order." By this expression it is meant that speakers are under a constant liability to wander from the point under discussion. They are apt to digress into other subjects, and confuse their auditors; and these, getting impatient, are equally apt to interrupt them, so that a single irrelevant observation may lead to hours of idle debate or colloquy, or "speaking to order," as it is termed. and thus the harmony of the assembly be destroyed. Those who attend such meetings should therefore have a regard for the following regulations:—If they speak, they should keep closely to the subject in hand. If they be listeners, they should preserve a strict silence. It is ungentlemanly, not to say disorderly, to utter any sound or make any observation on what a speaker is saying. The speaker must on no account be interrupted, so long as he keeps to order; and if not in order, it is the chairman's duty to check him. It is likewise disorderly to speak more than once, except in replying before the vote is put, or except it be the rule of the assembly to permit it. Sometimes persons who have spoken rise again to speak as to "a matter of form." This is allowable, but in speaking as to form, the merits of the case should not be introduced. On this, however, as on every other point, there is a perpetual tendency to go out of order, and hence the absolute necessity for appointing a chairman well acquainted with the forms of public deliberation, and who has the strength of mind to insist on order being preserved.

At all our public assemblages, a certain degree of courtesy is used both among speakers and listeners. On an individual rising to speak, he addresses himself politely to the chairman, and the chairman in return politely mentions the name of the speaker; by which means the audience is made acquainted with the gentleman who is about to address them. When the discussions of the meeting are over, the chairman closes the business with a few observations, and then dissolves the assembly by leaving the chair. When any dispute arises in the course of the business of the meeting upon points of form, it is customary to appeal to the usages of the House of Commons for an example to be followed.

DUTIES AS ELECTORS.

There are duties of another nature which we may be called on to perform in our character of citizens. We are invested with the high and solemn trust of electing our representatives in Parliament, as well as representatives in our municipal institutions. In the execution of our duty as electors, we are bound to divest ourselves of all factious or personal considerations. We have certainly to consult our own good in making a choice of a representative, but it is only as flowing from the good of the whole community. We must hence act entirely without passion or prejudice. Let us examine the previous habits of life, public conduct, and avowed sentiments, of candidates, and calmly consider whether they are such as we can approve of, or as being consistent with the general welfare of the people. We should also recollect that we exercise the trust of electors for many who do not possess that privilege. A large proportion of the community consists of women and children, persons in an humble condition, the sick, and the helpless. These look to us for protection from wrong, and it is our duty to afford it to them. If we, therefore, act with levity and imprudence in appointing men, who, from their conduct and character, are unfitted to exercise the important function of public representatives, we in more ways than one commit a crime against society, and are unworthy of possessing the valuable prerogatives with which the constitution has invested us.

In our capacity as citizens, we are frequently called upon to elect representatives in different municipal bodies; such as civic managers of the city in which we reside, managers of local trusts—general, political, and religious. There is often much heat at such elections; a petty factious spirit frequently governs the choice which is made: sometimes the meanest passions of our nature are exhibited during the contest. The observations we have made on our duties as electors generally, apply here with peculiar force. As those who present themselves as candidates live amongst us, we can never find any difficulty in estimating their character and qualifications. But we must take care not to be borne away by private feelings; we must not give our vote simply because the candidate is an acquaintance. A consideration for *what is best for the public interest* should in every case govern us; and we should not be afraid to let these our sentiments be known, for they can give no honourable man offence. In all cases of elections of members of civic corporations, and such like bodies, the chief merit in electors, after that of good and respectable character, is soundness of judgment, and after that, activity of habits. The power of fine speaking, or eloquence, is not required in such a functionary, and should be esteemed very lightly. That which is required is a power of thinking coolly, an integrity of purpose, and a willingness and ability in taking a share of the burdensome duties to be performed. Our qualifications as electors, perhaps, render us liable to be ourselves elected. In the event, therefore, of being called forward by our fellow-citizens to fill the honourable situation of their representative, it is our duty to sacrifice perhaps our own feelings and a portion of our time in the public service, provided we conscientiously consider ourselves qualified for the task, and that our health and private circumstances permit it. The principal question we have to put to ourselves, when we are so brought forward, is, "Have we sufficient time to spare to attend the various meetings—to sit and deliberate in the numerous committees—to have our minds frequently occupied with public affairs?" If we deceive ourselves in answering this important question, we wrong society, and give ourselves cause for much after disquietude. Is it, or not, the [illegible] way for every one who is worthy of this trust, calmly, deliberately, and to the best of his knowledge and belief, to do those acts which will best preserve for his own use the beautiful fabric of our political institutions? If he perceives and rejoices in the good which he and others derive from it, will he not best perform his duties to those who come after him, to use it, and not abuse it, that they may have the like good? Little suggestions of selfishness, rivalry, and petty local interests, and, most of all, perverted and mischievous ambition, are the blocks over which citizens stumble and fall, in the otherwise luminous and clear path in which they are permitted to move.

DUTIES AS JURORS.

The laws under which we live give us the invaluable privilege of trial by jury; in other words, we are tried for the commission of offences by a body of men chosen indiscriminately, as nearly as convenient, from the class of society in which we have moved. By such a considerate regulation, there can be little risk of individual oppression, provided those who compose juries do their duty. It is therefore incumbent on citizens who are liable to serve in juries, to make themselves acquainted with what is understood to be their duty when so called upon. It requires no learning to fulfil the character of a juror. It requires no more than a coolness of thinking, and a mind above being carried away by prejudices or feelings. The juror is to remember that it is the jury which is the judge in the case, not the judges who sit on the bench. Keeping this in view, it is one of the chief qualities requisite in a jury to maintain its proper dignity and honour inviolate, nevertheless with all courtesy, and to act with firmness in the execution of its important function. Besides deliberating dispassionately on the evidence presented, it is the duty of the juror to be totally regardless of every consideration but that of strict justice. He is neither to regard the rank or life of the culprit, nor of the injured party. In a court of juriaprudence all men sink to an equality. It is also the duty of the juror, after forming his conscientious opinion, not to be coerced, or flattered, or spoken into a different opinion. He is invested with a solemn trust, and that trust he must preserve with scrupulous care, as consonant with the dearest interests of society.

DUTIES AS NEIGHBOURS.

Besides the duties which we have to perform as members of a great nation, we have duties of a similar nature to perform as inhabitants of a town, district, or neighbourhood, and in relation to which we sometimes receive the appellation of citizens. Every person belongs to a neighbourhood, which is both local and social. Even those who have removed into new countries, and who dwell in solitary abodes, do not lose the sentiment of neighbourhood. The nearest person to them is a neighbour, though separated by long distance. And when this sentiment cannot be preserved in fact, it may be in thought, and by that means it usually is so. Perhaps the last impressions that leave the heart of one who has wandered into far distant regions, are those made in his early days, in his native home. In general, as every one lives in a neighbourhood more or less dense, he can promote his own happiness, and that of those around him, by observing a becoming moral conduct. He has a right to enjoy life, and to use all things which he has, to that end; but he has not a right to any enjoyment which necessarily disturbs that of others. Peace, tranquillity, and security within one's own walls, is the main purpose of life. No one has a right to interfere in these things but by order of the public law. A neighbour, therefore, who so conducts himself, and those means of pleasure which he commands, as to vex, harass, and disturb those who are necessarily within sight, hearing, &c., commits an offence against morality. It often happens to be the pleasure of one who dwells in a dense neighbourhood, to keep one or more animals, whose habitual noises disturb those who necessarily dwell within hearing, in the hours allotted to repose, and frequently when persons are visited by sickness, and when any noise is distressing. Now, whatever the rigid law of the land may say on such cases, the law of morality says that the suffering party has an unquestionable right to remove his trouble, if the proprietor of the cause of such nuisance will not, on request, remove it himself. A more peaceable way would be, to have it removed by order of the public magistrate. Many of such petty nuisances ought to be removable on summary verbal application, and not in the slow, written, and printed process, in which the movements of ordinary law are commonly made.

The moral duties of neighbourhood extend to all things which minister to the common comfort, convenience, and security. Each one of a neighbourhood is bound to make his own dwelling-place as agreeable and pleasant to those around him as he reasonably can. Each one is morally held to uphold and sustain a good name for his own little community. He is, therefore, to join, with a liberal and manly feeling, in all the improvements which tend to please and adorn. Such things, even if they occasion some expenditure, are sources of self-satisfaction; and one comes at last to take an honourable pride in hearing his street, his village, his town, or city, commended by observers.

There is another sort of neighbourhood which is founded in social intercourse, and in the interchange of visiting and hospitality. As the world now is, this is commonly regulated by artificial and somewhat unnatural rules. It is often ostentatious, luxurious, and destitute of all feelings and thoughts in which well-trained moral minds can take pleasure. A profuse and voluptuous entertainment, comprising food little adapted to promote health and vigour, and in quantity sufficient for ten times the number, that rather look at than consume it, is an unsatisfying way of being happy in social intercourse. There are modes of maintaining such intercourse, which are innocent, pleasing, and dutiful. Mankind are fitted for such. The interchange of friendly visits, for conversation, music, and rational amusement, with such things as may be used without suffering or impairing health, is that kind of neighbourhood (in such relations) which is permitted and enjoined. We have, however, little reason to think that intimacies of this sort are likely to meet with such consideration as would induce the further extension of them.

Every person, in general, is a member of some kind of society or association. Some persons belong to many. These are intended for some useful purpose. Every one who is such a member has some duties to perform. He owes some proper part of his time, some proper contributions to the common object, and has an interest in the prosperity of the design. All these institutions do some good, and some of them eminent good, in helping on the great purpose of social life, which is general improvement Of this nature are public charities, educational institutions, libraries, agricultural societies, and those for suppressing intemperance and immorality. No well-disposed citizen can conscientiously abstain from giving his aid and support to such objects. It is each one's duty to try to leave the world a little better than he found it. No one can say that these are matters which do not concern him. Suppose every one should say so, and had said so from the beginning, society would still be made up of barbarians. Every good that is done in any community affects, directly or indirectly, every member of it. The law of example, of imitation, of doing as others do, has a most pervading and astonishing influence. Every community is like a full vessel of water; no one drop in it can be moved without affecting every other drop.

DUTIES IN OUR DOMESTIC RELATIONS.

Marriage.—This institution is agreeable to a law of nature, and is an ordinance of the Creator. There are profligates who have declared this; but they have exhibited no reason on their side. It is obvious that man is not only a gregarious, but a pairing animal. Marriage is consistent with the finest of his feelings—the most noble of his faculties. It began when man began. It is ordered to perpetuate the succession of the human family. It is ordered for the whole duration of adult age. It is man's peculiar privilege in this; it connects him with

generations which are gone, with that which is passing away, and with those which are to come. The memory and the ashes of the dead are precious to him, and no other animal has that sentiment. He alone contemplates that his own memory will be held in honour, and that the place of his earthly quiet will be sacred. He only is enabled to conceive that moral and physical wrong will bear his own stamp in the character and in the frame of those that follow him; he only knows that a good name may be an honourable inheritance. These are the sentiments which spring from the beneficent gift of marriage. However much one may misunderstand or abuse this gift, nature, ever faithful to her trust, forces these sentiments on the heart.

Marriage is recognised as a contract of a binding nature in all civilized nations. By some it is considered, from its solemnity, to be of a sacred character; by others it is deemed only a civil bond of connection. All, however, agree in holding it to be an irrevocable contract. The laws of the land, those of nature, and the divine laws disclose the sentiments, the feelings, and the awful sense of duty with which this undertaking should be regarded. Yet it is frequently entered into from motives highly reprehensible, and sometimes with shocking thoughtlessness. It is from such causes that we see that this sacred union, which should be the true source of the highest human happiness, becomes that inexhaustible fountain from which both parties are daily and hourly compelled to drink, and from the same cup, the bitterest waters.

In a great number of instances, marriage is contracted with exceedingly little regard to the qualities of the mind on either side, particularly on the side of the man. If one could penetrate the ear of an enamoured youth, some good might come from such suggestions as these:—Do you know what will come of that engagement which you are about to make? Are you about to tie yourself by bands, absolutely indissoluble while you live, to a mortal who has feelings, wishes, wants, hopes, and fears, which must become yours, and a part of your very self; or which you must resist, control, or contend with? Do you know that pain, suffering, and sorrow, originating in either, must be borne by both? Are you aware that whatsoever of error, folly or crime, may be chargeable to either of you, or to any who may spring from your contract, will be your common burden and shame; and that from these you can relieve yourself nowhere but in the grave? Or, do you know that this attractive being will be your kind friend; your counsellor; the welcome soother of your cares and anxieties; the generous and charitable judge of your infirmities; the inspirer of honourable ambition; your fellow-labourer in joint interests; the ornament of your life; the gracious, considerate, faithful, gentle companion, who will make your own virtuous home the place to which you refer all earthly happiness? Who that is "in love" has leisure or inclination to think of such *trifles* as these?

There is no reason why the passion of love should be wrapped up in mystery, nor any why the mind should be stained in considering its nature. It would prevent much sad and complicated misery in the world, if all young persons understood it truly. There are in every human being seeds, each one of which may be made to germinate, and may be so cultivated as to produce the most odious vices or the most pure and heavenly virtues. There is in every human heart a seed of kindness, tenderness, and affection, which ripens if known to be there in due time. It demands to be nourished. This is the trying and perilous moment in human life. There is some one somewhere, who will [illegible] and give back its full equivalent. The excited senses and the heart are in search of that one. Happy will it be for the searcher, if he will take reason as his monitor to keep the senses and heart in order. But reason is commonly regarded, not as a kind and faithful friend whose duty it is to whisper, "begin nothing of which you have not well considered the end," but as a withered scowling matron, who, being utterly dead to the impulses of youth, denies that there ought to be any. If there has been no preparation for this eventful period; if the mind has not been enriched with the teachings of rational prudence; if the eye has not been taught to distinguish between the real and the fictitious; if the ear has not learned to discriminate the meaning of sounds; if life, as a whole, if the consequences of irrevocable deeds be not thought of, there is peril; and the pure drop from the fountain may flow into any sea but that of happiness. In seeking for that being who is to be a companion during life, one grievous failing must be avoided. Young men frequently amuse themselves by playing with the feelings of young women. They visit them often, they walk with them, they pay them divers attentions, and after giving them an idea that they are attached to them, they either leave them, or, what is worse, never come to an explanation of their sentiments. This is to act the part of a *dangler*, a character truly infamous. Young men cannot be too cautious in the attentions which they bestow on unmarried females, who on their part should be equally guarded in not encouraging the addresses of any individuals whom they would not choose to marry.

According to the present state of society, one of the influential counteracting elements to marriage is or ought to be, a high degree of prudence. No one ought to marry who cannot foresee that he will be able to support the additional expenses of a wife and family, and at the same time fulfil his other necessary obligations. By good management, these additional charges are not great, but they amount to something, and he is worse than an infidel who does not provide against them. We are of belief that every industrious, active, and sober man, will find no serious obstacle in this respect. It is from idleness, love of company, and intemperance, not from simple expenditure on family necessaries and comforts, that ruin and poverty in the married life are produced. The dread of encountering the expenses of a family, though acting as a salutary check on imprudent marriages, is frequently productive of many gross vices, tending to the injury both of individuals and of society. Celibacy, especially when circumstances would permit marriage, is not respectable; it is considered akin to vagrancy. He who marries and settles down as a householder, meets with the approbation of the world. Why is this? it may be asked. Because in marrying we give a guarantee to society for our good behaviour. It is not to be doubted that a young, well-educated, industrious couple, who are sincerely and affectionately attached, on a sober examination and conviction of each other's worth and suitability to each other, may be happy with means far short of the fashionable standard. Presuming that such a couple are wise enough to take life for the real and substantial good that it can produce—and as a whole, it would do them great injustice to suppose that they could not find that good in a small, simple, cheerful, tranquil mansion—it would be doing the friends of such a couple the like injustice to suppose that they could not visit them, and be satisfied to see them happy through such means.

According to the usages of society, it is the custom for the male to propose marriage, and for the female to refuse or accept the offer as she may think fit. There ought to be a perfect freedom of the will in both parties. To impose any species of constraint on either party's most mischievous; it would be a gross violation of our most sacred privileges. Both parties, therefore, ought freely to think for themselves, however much they may seek the advice of those who are inclined to afford them counsel.

In treating of this subject, it may be of service to cite

a few special advices to young women. Our first recommendation is, that they ought to be in no haste to accept a lover. Let them know him a sufficient time to judge of his qualities of mind, temper, habits, &c., before they allow themselves to be inveigled into a marriage with him. Far better for them to remain single, than heedlessly incur the risk of being miserable during the remainder of their lives. In general, young women are much too anxious to involve themselves in this respect. The following observations on the injurious effects of making marriage the sole object of a young woman's thoughts, occur in a popular work by Mrs. Farrar, and are well worth attention.

"Some one hath said, that 'matrimony is with women the great business of life, whereas with men it is only an incident'—an important one, to be sure, but only one among many to which their attention is directed, and often kept entirely out of view during several years of their early life. Now, this difference gives the other sex a great advantage over you; and the best way to equalize your lot, and become as wise as they are, is to think as little about it as they do.

"The less your mind dwells upon lovers and matrimony, the more agreeable and profitable will be your intercourse with gentlemen. If you regard men as intellectual beings, who have access to certain sources of knowledge of which you are deprived, and seek to derive all the benefit you can from their peculiar attainments and experience—if you talk to them as one rational being should with another, and never remind them that you are candidates for matrimony—you will enjoy far more than you can by regarding them under that one aspect of possible future admirers and lovers. When that is the ruling and absorbing thought, you have not the proper use of your faculties; your manners are constrained and awkward, you are easily embarrassed, and made to say what is ill-judged, silly, and out of place; and you defeat your own views by appearing to a great disadvantage.

"However secret you may be in these speculations, if you are continually thinking of them, and attaching undue importance to the acquaintance of gentlemen, it will most certainly show itself in your manners and conversation, and will betray a weakness that is held in especial contempt by the stronger sex.

"Since the customs of society have awarded to man the privilege of making the first advance towards matrimony, it is the safest and happiest way for woman to leave the matter entirely in his hands. She should be so educated as to consider that the great end of existence—preparation for eternity—may be equally attained in married or single life, and that no union but the most perfect one is at all desirable. Matrimony should be considered as an incident in life, which, if it come at all, must come without any contrivance of yours; and therefore you may safely put aside all thoughts of it till some one forces the subject upon your notice by professions of a particular interest in you.

"Lively, ingenuous, conversable, and charming little girls, are often spoiled into dull, bashful, silent young ladies, and all because their heads are full of nonsense about beaux and lovers. They have a thousand thoughts and feelings which they would be ashamed to confess, though not ashamed to entertain; and their preoccupation with a subject which they had better let entirely alone, prevents their being the agreeable and rational companions of the gentlemen of their acquaintance which they were designed to be.

"Girls get into all sorts of scrapes by this undue preoccupation of mind; they misconstrue the commonest attentions into marks of particular regard, and thus nourish a fancy for a person who has never once thought of them but as an agreeable acquaintance. They lose the enjoyment of a party, if certain beaux are not there, whom they expected to meet; they become jealous of their best friends, if the beaux are there and do not talk to them as much as they wish; every trifle is magnified into something of importance—a fruitful source of misery—and things of real importance are neglected for chimeras. And all this gratuitous pains-taking defeats its own ends! The labour is all in vain; such girls are not the most popular; and those who seem never to have thought about matrimony at all, are sought and preferred before them." We may add the advice, that young women should not consider it a serious misfortune, even if never married: there is nothing disreputable, while there may be much happiness, in the condition of an old maid.

HUSBAND AND WIFE.

Marriage having, at length, taken place between two parties who feel a reasonable hope of being happy together for life, each has entered on a condition requiring the exercise of particular duties. These we shall endeavour to narrate, commencing with advices

To Husbands.—I. Always regard your wife as your equal; treat her with kindness, respect, and attention; and never address her with the appearance of an air of authority, as if she were, as some misguided husbands appear to regard their wives, a mere housekeeper.

II. Never interfere in her domestic concerns, such as hiring servants, &c.

III. Always keep her properly supplied with money for furnishing your table in a style proportioned to your means, and for the purchase of dress, and whatever other articles she may require, suitable to her station in life.

IV. Cheerfully and promptly comply with all her reasonable requests.

V. Never be so unjust as to lose your temper toward her, in consequence of indifferent cookery, or irregularity in the hours of meals, or any other mismanagement caused by her servants; knowing the difficulty of making many of them do their duty

VI. If she have prudence and good sense, consult her in all great operations involving the risk of very serious injury in case of failure. Many a man has been rescued from ruin by the wise counsels of his wife; and many a foolish husband has more seriously injured himself and family by the rejection of the advice of his wife, stupidly fearing, if he followed it, he would be regarded as henpecked! A husband can never consult a counsellor more deeply interested in his welfare than his wife

VII. If distressed or embarrassed in your circumstances, communicate your situation to her with candour, that she may bear your difficulties in mind, in her expenditures. Women sometimes, believing their husbands' circumstances better than they really are, disburse money which cannot be well afforded, and which, if they knew the real situation of their husbands' affairs, they would shrink from expending.

VIII. Never on any account chide or rebuke your wife in company, should she make any mistake in history, geography, grammar, or, indeed, on any other subject. There are, I am persuaded, many wives of such keen feelings and high spirits (such wives deserve to be treated with the utmost delicacy), that they would rather receive a severe and bitter scolding in private, than a rebuke in company, calculated to display ignorance or folly, or to impair them in their own opinion, or in that of others.

To Wives.—I. Always receive your husband with smiles—leaving nothing undone to render home agreeable—and gratefully reciprocate his kindness and attention.

II. Study to gratify his inclinations, in regard to food and cookery; in the management of the family, in your dress, manners, and deportment.

III. Never attempt to rule, or appear to rule, your

husband. Such conduct degrades husbands—and wives always partake largely in the degradation of their husbands.

IV. In every thing reasonable comply with his wishes with cheerfulness—and even, as far as possible, anticipate them.

V. Avoid all altercations or arguments leading to ill humour—and more especially before company. Few things are more disgusting than the altercations of the married, when in the company of friends or strangers.

VI. Never attempt to interfere in his business unless he ask your advice or counsel; and never attempt to control him in the management of it.

VII. Never confide to gossips any of the failings or imperfections of your husband, nor any of those little differences that occasionally arise in the married state. If you do, you may rest assured that, however strong the injunctions of secrecy on the one hand, or the pledge on the other, they will in a day or two become the common talk of the neighbourhood.

VIII. Try to cultivate your mind, so as, should your husband be intelligent and well-informed, you may join in rational conversation with him and his friends.

IX. Think nothing a trifle that may produce even a momentary breach of harmony, or the slightest uneasy sensation.

X. If your husband be in business, always, in your expenditures, bear in mind the trying vicissitudes to which trade and commerce are subject; and do not expose yourself to the reproach, should he experience one of them, of having unnecessarily expended money of which you and your offspring may afterwards be in want.

XI. While you carefully shun, in providing for your family, the Scylla of meanness and parsimony, avoid equally the Charybdis of extravagance.

XII. If you be disposed to economize, I beseech you not to extend your economy to the wages you pay to seamstresses or washerwomen, who, particularly the latter, are too frequently ground to the earth by the inadequacy of the wages they receive. Economize, if you will, in shawls, bonnets, and handkerchiefs; but never, by exacting labour from the poor without adequate compensation, incur the dire anathemas pronounced in the Scriptures against the oppressors of the poor.

To both Parties.—I. Should differences arise between husband and wife, the contest ought not to be, as it unfortunately too frequently is, who shall display the most *spirit*, but who shall make the first advances, which ought to be met more than half way. There is scarcely a more prolific source of unhappiness in the married state, than this *spirit*, the legitimate offspring of odious pride and destitution of feeling.

II. Perhaps the whole art of happiness in the married state might be compressed into two maxims—"Bear, and forbear;" and "Let the husband treat his wife, and the wife her husband, with as much respect and attention as he would a strange lady, and she a strange gentleman."

III. I trust much caution is scarcely necessary against flirtations, well calculated to excite uneasiness, doubts, and suspicions, in the heart of the husband or wife of the party who indulges in them, and to give occasion to the censorious to make sinister observations; and it is unfortunately too true, that the suspicion of misconduct often produces fully as much scandal and evil as the reality.

It is a good rule of reason and common sense, that we should not only be, but appear to be, scrupulously correct in our conduct. And be it observed, that, however pure and innocent the purposes of the parties may be at the commencement, flirtation too often leads to disastrous results. It breaks down some of the guards that hedge round innocence. The parties in these cases are not inaptly compared to the moth fluttering around a lighted candle, unaware of the impending danger. It finally burns its wings, and is thus mutilated for life. "He that loveth the danger, shall perish therein." "Lead us not into temptation" is a wise prayer; and while we pray not to be "led into temptation," we most assuredly ought not to lead ourselves into it. I know these remarks will be charged to the account of prudery; but, at the risk of that charge, I cannot withhold them.

IV. Avoid all references to past differences of opinion, or subjects of altercation that have, at a former day, excited uneasiness. Remember the old story of the blackbird and the thrush. "I insist it was a blackbird." "But I insist it was a thrush," &c.

The preceding rules, if as closely followed as human imperfection will allow, can hardly fail to secure happiness. And should only one out of every ten readers profit by them, I shall be richly paid for their concoction.

I cannot conclude this brief essay better than by adding the following admirable advices of Julia de Roubigné to her daughter, shortly previous to her death:—

"Sweetness of temper, affection to a husband, and attention to his interests, constitute the duties of a wife, and form the basis of matrimonial felicity. These are, indeed, the texts from which every rule for attaining that felicity is drawn. The charms of beauty, and the brilliancy of wit, though they may captivate in the mistress, will not long delight in the wife. They will shine on even their own transitory reign, if, as I have seen in many wives, they shine more for the attraction of everybody else than of their husbands. Let the pleasing of that one person be a thought never absent from your conduct. If he love you as you would wish he should, he would bleed at heart should he suppose it for a moment withdrawn; if he do not, his pride will supply the place of love, and his resentment that of suffering.

"Never consider a trifle what may tend to please him. The greater articles of duty he will set down as his due; but the lesser attentions he will mark as favours; and, trust me, for I have experienced it, there is no feeling more delightful to one's self, than that of turning these little things to so precious a use.

"Above all, let a wife beware of communicating to others any want of duty or tenderness she may think she has perceived in her husband. This untwists at once those delicate cords which preserve the unity of the marriage engagement. Its sacredness is broken for ever, if third parties are made witnesses of its failings, or umpires of its disputes."*

FAMILY RELATIONSHIP.

The marriage state is the foundation of one of the most sacred and important institutions in society—that of a family. A family is a little commonwealth, jointly governed by the parents, but under the more special guardianship and direction of the husband and father, who is morally and legally the *head of the house*. To the father the children naturally look for protection, subsistence, advice, example, and encouragement. The father, therefore, has a serious obligation to perform in the proper rearing of his children. He is bound to educate them according to his means, to support them till they are able to depend on themselves, and to have them taught a business, or put them in some other fair way of gaining an honest livelihood. The children, on the other hand, are bound to obey their parents, and to exert themselves to make them happy.

Parents are sometimes grievously distressed in consequence of the bad behaviour of their children. Their

* The above excellent admonitions to husbands and wives are from an American work, called the Philosophy of Common Sense, by Mr. Carey.

reasonable hopes are disappointed, their best feelings are tortured. An idle, ungrateful, dissolute son, is such a complicated cause of suffering, as may, if any thing may, lead one to murmur at the order of things. It may be admitted that such a parent is very likely to break out with complaints against the world. This suffering, however keen and biting it may be, is not a natural, but a moral evil. There is a moral wrong somewhere. Is it in the parent himself? Has he watched the beginning of error, and drawn his child off from the descending plane? But, perhaps, the downward course has been long begun upon, and art and deceit have made such progress that the child has been able to elude parental inquiry. This can hardly happen with a watchful parent while his child is under his own roof. Perhaps the downward course has been begun upon when a child is at a distant school, college, or in a place of business, preparing for manhood. If a parent has placed a child where he cannot superintend him, or with those who do not undertake to do this, or who will not if they do, the parent is not excused because others are in fault. A child who is sent away from home, is, as the world now is, always sent into some hazard. The hazard is, when least, that the preceptor, guardian, and master may be deceived. The seductions may be such as to plunge a boy into ruin, even before those who see him daily, and who mean to do their duty, have the least intimation of it.

Evils, such as are here alluded to, may be in some measure unavoidable in the present imperfect condition of society; still a parent ought to do all in his power to obviate them by implanting good habits in his children. It would be well, for instance, if fathers of families would endeavour to give their sons a taste for such a judicious course of reading as would lead them from the contemplation of vicious objects of pursuit. If they do so, and put them in a right bias, they may depend on them acquiring a great deal more useful knowledge after they leave school than they could possibly have learned there. Nearly all the men who have distinguished themselves in the world are found to have acquired their knowledge though private desultory study after leaving their classes; and many, in their autobiographies, trace their good fortune to the taste for reading given them by their parents.

A family of children usually consists of the two sexes. There are brothers and sisters. The intercourse which takes place between these parties ought to be of the most friendly kind. They should strive, by mutual assistance and advice, to make each other happy. In many instances, these relations make a very great mistake as to the real good of life, in not cultivating a cordial and affectionate friendship with each other. In early life they are apt to be in each other's way, and to have irreconcilable wants; thus they very soon fall into alienations. They cannot, however, shake off the laws of nature. They must have an interest in each other, whether they will or not, and it will essentially promote their mutual welfare to have a kind and gracious one. The common causes of their differences are exceedingly insignificant, and often contemptible. They will see the day when they will so think of them. The time presses hard upon them when they will need counsel, support, and some one to care for them in a manner which none but brothers and sisters can do. When all has gone on well from the cradle upwards, among such relatives, they become to each other not only the most useful friends, but the most agreeable companions. They are the natural confidants, when it would be folly to trust any one whose sympathy and solicitude may change. Brothers and sisters, who are thus bound together by affection, sometimes hazard the connection by volunteering friendly, but very unwelcome, commentaries and advice. This is a very delicate matter. Giving unasked advice on any occasion requires very great discretion. If one sees that his brother is blundering, there are many modes of so approaching him as to lead him to find that he needs advice, and of putting him in search of it. If there be a right understanding, he will go where he is sure of having the best and the sincerest. To assume a dictatorial authority over a brother or sister, is to inflict a wound on self-love which is not readily forgiven. We have already noticed the value of civility and politeness between such near connections; and we add, that sincerity and truth are nowhere more profitable and necessary. "Familiarity breeds contempt" is a true saying, and is very apt to find an application of its truth not only in the intercourse of brothers and sisters, but in that among more distant relations. We beg to warn all classes of relations who frequently meet together, against using too much familiarity, against using too little ceremony, against taking liberties with each other. Let them preserve towards one another the most respectful yet friendly terms, if they wish to avoid falling into differences. Let them remember that the quarrels of relations are almost irreconcilable, and that, even when forgiven and in a great measure forgotten, they leave very disagreeable feelings among all parties.

DUTIES OF MASTERS AND SERVANTS.

From the earliest ages down to the present time, there have been different classes of society. As elsewhere explained, this necessarily arises from the very order of society. The well-established and very proper right of inheritance, and the ability which some members of society have to acquire, and which others have not, the difference of education, and other obvious causes, necessarily produce these distinctions. Who among the various classes is the most contented and happy, is quite another matter. There must be some to serve, and some to be served. They are mutually dependent. We hear great complaints, sometimes from masters with regard to their servants, and sometimes from servants with regard to their masters or employers. This connection is regarded as one of the miseries of life; yet it is not necessarily so. If the connection produce vexation, there must be error somewhere. We shall first speak of the duties of masters, in which we always include those of mistresses.

It is the duty of masters to cultivate the esteem and affection of those whom circumstances have placed under them. Servants have the same sort of bones, muscles, heads, and hearts, the same selfishness, and the same sensibilities, as their employers. They may not be so refined, still they have rights to be maintained, and must not be tyrannized over, merely because they are in an inferior condition. They have as good a right to be happy as those above them. If they behave with propriety, and do their duty, they should be spared when sick, advised and relieved when in trouble, and be made as comfortable as circumstances will permit. The commands given to them should be plain, clear, uniform, and not contradictory or capricious. They are not to be sneered at, or commanded with virulence and reproach, but mildly, and rather by request. They are also to be treated with uniform civility; but every approach to familiarity with them should be avoided, if respect on both sides is to be preserved. It is always best to let servants know what is their duty, what is expected of them; this being beneficial to both parties. Much mischief is sometimes created by not attending to this rule.

The duties of servants to masters are equally clear. Their entering into servitude is a contract which they engage to fulfil. They are bound to execute all reasonable and proper orders in the line of service in which they are engaged. But besides this, they would consult their interests in being generally obliging and willing to assist in any kind of exigency. A seeming wish to please an employer, goes a great way to compensate

deficiencies in ability. A civil, obliging turn is indeed one of the chief virtues in a servant, and is certain to secure the affection of masters and mistresses. A strict attention to an employer's interest, regularity of habits, and perfect integrity both in speech and action, form the principal qualifications of a servant. There is usually much less actual dishonesty among servants than a regardlessness of their masters' interests and time. This is more the case with domestic than other servants. This class of persons, who are chiefly females, are very apt to encroach on the time of their employers for their own pleasure and convenience. If sent an errand, they will spend a great deal more of time in executing it than is necessary. It is an idle love of gossiping which generally produces this great failing among servants, and it is our duty here to admonish them of its impropriety. Their time belongs to their master, and it is dishonest to use it for their own purposes, unless by permission. Speaking with regard to persons in service generally, we are sorry to notice that there is a tendency to reduce the terms of contract betwixt employers and employed, to one of a purely mercenary nature—so much work for so much money. There appears to be a growing inclination to drop all kindliness of intercourse betwixt the two classes. The consequence is, that many masters feel perfectly indifferent with respect to giving employment to those who have long served them. The injury is, however, mutual; for, when servants know that they are only valued in proportion to the amount of their actual labour, and that they will be paid off without regret, they care little for a master's interest. There can be no question as to who began this improper system. It originated in servants and workmen endeavouring to establish by violence and intimidation a certain amount of wages for their labour, and which the state of society could not warrant. We earnestly trust that it is not yet too late to restore the ancient bond of sympathy betwixt every description of employers and employed. Individual and social benefit would be the result.

DUTY OF TRUSTING TO OURSELVES.

There is a duty of an important nature which we have to perform towards society; and that is, we must *trust to ourselves*. We have each been endowed with reason to guide us, and hands to work; why, then, unless prostrated with bodily disease, or some other infirmity, should we think of leaning upon others for support or assistance? It would not be desirable to see men shut up their hearts against each other, and each stand in the panoply of his own resolutions, determined against every friendly appeal whatsoever. It is possible, however, to be not altogether a churl, and yet to take care lest we be tempted into an exertion of benevolence dangerous to ourselves, while it is of little advantage to our friends. Notwithstanding the many ties which connect a man with society, he nevertheless bears largely imprinted on his forehead the original doom, that he must chiefly be dependent on his own labour for subsistence. It is found by all men of experience, that, in so far as one trusts to his own exertions solely, he will be apt to flourish; and in so far as he leans and depends upon others, he will be the reverse. But there are many who do not recognise this principle. They trust only partially to themselves, and are always poking about after large favours from friends. We find them asking loans of money, asking others to be surety for them, asking acquaintances to interfere to get places for them. If they ask for nothing else, they intrude upon their friends to seek advice. Neither physically nor morally do they seem able to exert themselves for their own behoof. This is so contemptible a mode of living, that it cannot be too severely reprehended. Those who depend on others can never succeed in life. In whatever manner they may be assisted, they can never become front-rank men in society. We would earnestly impress upon the young the propriety of depending as little as possible upon prospects of advantages from others, all of whom have enough to do with themselves. It is obviously the duty of every one to think and act for himself, as soon as he attains manhood, and neither be burdensome on relatives nor troublesome to acquaintances. The acceptance of a trifling favour from an acquaintance always lays us under an obligation, which is sometimes difficult to remove. If the acquaintance ever need similar favours, we feel bound to grant them, and perhaps he estimates the original favour so highly, that he thinks we cannot do enough to serve him. In this way hundreds of men are ruined. We would say, accept no favours, unless upon a principle of common courtesy. If you employ others to execute a piece of work, take care to pay them faithfully and promptly, and lie under no obligation to them, otherwise you may be called upon when you least expect it, to make payment an hundredfold. Be liberal, affable, and kind; but, knowing that you cannot do more injury to society than by greatly injuring yourself, exercise a just caution in giving way to the solicitations of your friends. Never be too ready to convince yourself that it is right to involve yourself largely, in order to help any person into a particular station in society; rather let him begin at the bottom, and he will be all the better fitted for his place, when he reaches it, by having fought his way up through the lower stages.

MAKING A WILL.

Much distress among families is often produced by individuals who have property to bequeath, not making a will or testament. Why such individuals do not make their wills, it is difficult to explain. Perhaps it arises from carelessness and a spirit of procrastination, or a want of resolution in men to make up their minds with respect to how they would distribute their property at their decease. Some may indeed be so foolish as to imagine that the making of their will would hasten the approach of death. From whatever cause it proceeds, it is a highly blamable failing. It is the duty of every person possessing property, whether engaged in business or otherwise, to make a will, and describe in some species of document how he would wish his affairs to be arranged in the event of his dying. There certainly are cases in which men of property would not wish their possessions to be distributed in any other way than as the law would dictate; yet it is a mark of a well-regulated mind to leave a will descriptive of the means to be pursued in the accession to, and management of, their property and concerns. To do so, at least, would often save a great deal of trouble and some expense, and be a preventive of litigation among relations. We therefore must insist that the making of a will is a sacred duty which ought to be performed, and performed without procrastination. In the midst of life we are in death; no one knows but in an hour hence he may be no more. We beseech fathers of families, and others similarly placed—those even who may have property but to the value of a few pounds—to lose no time in executing their will. By leaving so much as a letter subscribed by their name, to be opened after their decease, they may spare much vexation to those whom they hold dear; they may quench much petty jealousy, much unseemly disputation. In a country such as Scotland, where a wife dying without having had any live children, the one-half of the movable property of the husband goes legally to her relations, it is incumbent on wives so circumstanced, if they have any love and esteem for their husbands, to make their wills: that is, put in writing a simple expression of their desire that their husbands may inherit the property which belongs to the wife in virtue of their marriage. By an inattention to this easily get

formed duty, there are many litigations—many widowers ruined.

MISFORTUNES—EVILS.

Evil is a part of the system of things in which we live, and, as such, must be patiently submitted to. Man was intended to be an active creature. One of the grand aims of the Creator in his formation evidently was, that he should never settle down into a sluggish or stagnant state. It would have been easy for the divine power which breathed into him so wonderful a thing as life, to have surrounded him with nothing but blessings, as they are called, so that he would have nothing to do but enjoy himself. But this would not have produced what the Almighty wished, a world in which a rational being was to exercise his faculties, and use his endowments, with a proper regard to a certain end—an account, namely, to be rendered at the close, of what and how he had done. We are here placed between evils which we are to avoid or subdue, and good which we are to aim at and enjoy; and hence, instead of being a set of torpid machines, as we would have been in any thing like a world of perfect happiness, we are in a perpetual state of vigilance and activity, making the fullest use of those mental and bodily properties with which we have been gifted.

If we narrowly inspect the evils or misfortunes with which we are visited, we will find them invariably to be, either of two kinds. Some are the simple result of an occasional or habitual violation of the laws of nature, or an occasional or habitual failure in that vigilance and activity which we are bound to employ for the avoiding of such distresses. These may be called moral evils. The second class are the result of circumstances over which we had no control, and may therefore be called natural evils. Such a division, however, is only necessary in the present state of our attainments as a race; for there can be no doubt that means were intended to be discovered by the ingenuity of man, for the avoidance and neutralization of all evils whatever; and, therefore, in the case of what we call natural evils, we should only consider ourselves as the victims of imperfect knowledge, and be the more induced to strain after the improvement of ourselves and of our fellow-creatures, so as to obviate these as well as the rest.

Great care should be taken, when an evil befalls us, to ascertain whether it be moral or natural—in other words, whether it be the consequence of our own error, or of circumstances at present beyond our control. Our self-love makes us extremely apt to attribute all our mishaps to the latter cause; but if we are wise, we will not do so. We will rather search back unscrupulously into our own nature, or our own history, for the causes of the evil; and if we find them there, resolve for the future to be more circumspect or more active, so as to make a recurrence of the mischief less likely. The most of the accidents that occur, though they appear at first sight to be natural evils, would be found, on close inspection, to be moral. The most of the diseases that befall us could be traced to a failure in our duty to ourselves, and are therefore moral evils: the rest, such as cancers, worms, organic malformations, &c., which appear natural and unavoidable, are, we have no doubt, moral evils also. If *we knew better*, we might probably avoid them, as easily as we can avoid colds. They may be called natural in the mean time, but not so unless we strive to discover their causes, so as in the long-run to obviate them. They are certainly destined to be obviated at last, as many disorders, now understood, formerly were; and we must at present consider them only in the light of an inducement to the exertion of the spirit of inquiry.

There are some evils which we incur through hereditary channels, and are quite beyond our own control. We are charged, for instance, with the seeds of a harassing ailment, or of an early death, by the long foregone and perhaps long repented vices of our parents. But all this may be accounted for on the same principle. It has been intended that our moral natures should be so much improved, that even the possible distresses of a descendant may operate as a check to our wickedness; and what is a contemporary instance of innocent consumption but a warning to prevent us from doing that which may bring future lives into the same hazard? It is hard, in the mean time, for the sufferer; but what can we say against the course of nature? Perhaps the spectacle (and few can be more painful) of a youth dying in his very bloom, in consequence of natural debility derived from weakly parents, may be the means of preventing two persons from putting themselves into the situation for bringing on similar evils. A very high kind of conscientiousness, but one not unattainable even by ordinary minds, is called into force by the contemplation of such a case of unbought distress. A man who has any reason to fear for the validity of his own constitution, will, if fully impressed with a sense of such results, as likely to arise from his quitting a condition of celibacy, condemn himself to perpetual solitude rather than purchase an improvement of his own happiness, at the expense of unreckonable evil to others. Fortunately, society is beginning to look more narrowly into such matters than it used to do; and we do not despair of seeing a time when it will be nearly as infamous to communicate life under certain circumstances, as, under others, to take it away.

There are other evils which affect society, and which do their full part in making this a world of wo. There is squalid, miserable poverty; there is disgusting, lamentable vice; there is horrible crime, public execution, and national war. All these things, it is said, are inevitable; they spring from the nature of man, and from the laws which compel him to dwell in social connection. Those who say so are shallow thinkers. The world is naturally a beautiful world. But what God has made a paradise for our dwelling-place, mankind have often rendered a desert by their crimes. Nature and revelation alike proclaim that the Creator intended we should be happy; but how has brutal ignorance, vile intemperance, gross crime, and every species of evil desires, blighted our comforts and degraded our immortal being! It has never yet been proved that there must *necessarily* be poverty, which is the source of many evils. A striking instance of the absence of poverty in a large class of society is found in the case of the Quakers, or community of Friends. With some peculiarities in speech and dress, not worth while to heed, this numerous body of individuals act upon a fixed uniform principle of suppressing the passions. They curb the appetites and headlong impulses of human nature. In this may be said to lie the substance of sound morals. The Quakers, therefore, habitually practise what other classes only theorize upon, at least are seldom performing. The consequence of this guardedness in thought and action is, that although there are many thousands of Quakers in Great Britain, and many thousands in the United States of America, neither in the one country nor the other do we ever find a Quaker begging in the streets, or an intoxicated Quaker, or any one of this class of subjects and citizens at the bar of a criminal court! The Quakers are, like other people, engaged in the common affairs of the world; they are merchants, mechanics, artificers, mariners, and otherwise employed in the ordinary business of life. They are subject to the same temptations and perversions that we are; yet, by the exercise of a singular degree of prudence, they avoid them. Here, then, is a clear demonstration, that even without the aid of civil power, but by the mere force of moral influence, there is a class of men, in the midst of society, who do escape disgraceful poverty, and who are free from vice and crime.

With regard to death, which is so generally looked upon as an evil, and the last and worst of all, it is in reality no such thing, unless it occur prematurely, which it never would do if men were perfect in the observation of the laws of nature. As the conclusion of an existence which never could have been given if others had not died, it must be regarded as only a part of our earthly destiny, and submitted to accordingly.

INEQUALITY OF RANK AND CONDITION.

When the young grow up, they find society to consist of classes of various degrees of rank and condition; some with titles of distinction, others without any title whatever; some rich, some poor, and many in a middle state between great wealth and poverty. The youthful reasoner perhaps thinks that all this is wrong, and that by *natural right* all men ought to be upon a level. It is proper that not only the young, but others who take up notions of this kind, should be told why these differences originate, and why they exist. Mankind, we may suppose, were originally equal in rank and condition; and they might have remained so, or nearly so, had they continued to remain in primeval barbarity, and lived apart from each other. But it was not in their nature to remain in this condition. According to naturalists, man is a gregarious animal; that is, he desires to live in society. As soon as men began to consort together, they began to separate into ranks and conditions. He who was the bravest was made king; he who was the most clever or the most prudent became the most wealthy; he who was the most idle became the most poor. From this kind of beginning all ranks and conditions sprung; and subsequent events have modified society into what we now see it. It may be said that this explanation would do very well if we now found that those who enjoy distinctions in rank were the cleverest of the people; if we found that the richest were always the most deserving of riches. Here, again, we must apply to human nature.

In one sense, titles are contemptible; they are fantastic trappings which a wise man would not covet. But, on the whole, there are few men possessing that degree of wisdom and self-denial which would lead them to despise titles, or the dignities connected with them, *when applied to themselves.* As far as we can discover, the Quakers are the only people who do not regard these things. The citizens of the United States of America affect to despise titles; yet, it is curious, they give a title of distinction to their chief magistrate, whom they style "*His Excellency;*" they also write *Master*, or its contraction *Mr.*, before their names. In this we see a degree of the same vanity and weakness which affects the subjects of ancient monarchies. It would appear that there is a yearning after these follies among mankind. Be it so or not, it is an idiosyncrasy which, from time immemorial, has been seized hold of by rulers for the purpose of stimulating men to deeds beneficial to their country. The prospect of being entitled to have *Sir* written before their names, or of being called a *Lord*, induces numbers of individuals to do great and good actions, which they would not do for money. As these titles generally descend to their children, they have a double stimulant to action. Genius not being hereditary, these titles may and do fall into the possession of men of no ability; nevertheless, the stimulant to acquire titles such as they have, continues to act beneficially, as it is thought, through the nation; and they themselves feel bound to sustain a certain honourable character consistent with their rank.

The principles of human nature apply in a similar manner in solving the mystery, why there are men enjoying riches which they never wrought for, and may be undeserving of. Riches consist of that part of the surface of the earth which can be used for human habitations and their appendages; of that part which can be used to produce vegetation; of that part over which, and near which, there are flowing waters capable of imparting motion; they consist of all personal estate; and of money, the agreed representative of all property, which is, at the same time, property in itself. Possessions of these various kinds are acquired by inheritance or by industry. Right by inheritance is not wrong. Would any rational mind maintain, that, when the father of a family, or any one who has no family, has acquired property, and dies, that it shall belong of right to any and to all who can get possession, by fraud, force, or whatsoever other means they may? Society could not be held together if such were the rule of right. It is at once apparent, that if such were the rule, there would be nothing to contend for, because all inducement to acquire for the benefit of one's family and connections would be annihilated. Society would be forthwith reduced to barbarism. The right to acquire, and the right of inheritance, are wisely ordained to be a necessary consequence of society, and one of its strongest motives to act to useful ends.

If it be reconcilable to justice, to convenience, and to the common good, to take by fraud or violence that which the dead must have left behind them, much more so is it to take from the living, by like means, that which they can honestly acquire by the exercise of their own industry. If a member of a community were always liable to be despoiled of the fruits of his labour, the great principle of the system of being to which man belongs would have been misplaced: there would have been no sufficient motive to action. If one would know what society would be, if such were the law and the practice as to property inherited or acquired, he must visit countries steeped in barbarism, and on which the light of Christianity does shine.

It is contended by some persons that there should be a periodical division of land and property, and that every member of the community shall have an equal share. How often should this division be made? Shall it be made once a year, once in ten years, once in fifty years? Why should it be made at one time rather than at another? Suppose it could be made, and were made, it must be but a very short time before it ought to be made again, if the reason for making it be, that some have more and some less, and that some are rich and some poor. One must be wilfully blind not to see that either the whole action of society must stop, or that inequality of condition would arise in a single year, perhaps in a single month; and even such inequality as would call for a new division. In a country where the spirit of enterprise and speculation has an unrestrained agency, the causes of regret are, that sad reverses occur, and that property changes hands too often, rather than that it is unreasonably held in the hands of a few of their successors. A small number of generations is sure to bring equality, considering our community as a continuing one. Thus, property comes and goes, in this country, as fast as any one can reasonably desire to have it. The changes which are seen, as to the ownership of it, are regulated by authority far wiser than any of man's institution.

ON FORMING OPINIONS.

Opinion signifies belief. There are good and bad opinions. It is our duty as rational beings to cultivate good or correct opinions upon every subject, and to eschew those which are of a contrary description. There is nothing more easy than to form hasty, inaccurate opinions, but it is very difficult to form a correct belief on many topics. Opinion is found to be more or less dependent on times, circumstances, and bodily temperaments. It frequently arises out of prejudice, and is often influenced by impulse. When we form an opinion upon any subject, we are inclined to believe that all opinions

of an opposite character have been, and are, erroneous. We are apt to laugh at everybody's opinion but our own. All this betrays a deficiency of sober reflection, an ignorance of the history and faculties of mankind, and a want of knowledge of the world. The people of every country possess opinions favourable to their own fashions, customs, laws, and religion, and unfavourable to those of other nations. A love of one's own country is certainly a commendable feeling, but it should be a love arising from examination and conviction, not from prejudice. The Hindoo worships the river Ganges. *We*, by our education, know that this is nonsense. The bigoted but conscientious Turk will go to death upon it, that Mohammed was a true prophet. *We*, by our superior intelligence and reading, know that Mohammed was a vile impostor. The people who lived in our own country a hundred years ago were of belief that certain old women, whom they termed witches, could, by supernatural powers, raise tempests at sea and land, and malevolently interrupt the course of human affairs. The people who possessed this belief were perfectly conscientious in their opinion; yet *we* know that this opinion was a gross absurdity. *We* know that our ancestors believed in an impossibility. Opinion is therefore, as we see, a thing of time and place. The opinion that is supposed to be right in one century, is wrong in the next. What is considered to be a right opinion in Asia, is thought wrong in Europe. What is deemed a correct and praiseworthy belief in Britain, is reckoned an absurdity in France. Indeed, it is often seen that the opinion which is held good in one district of a country, is looked upon with contempt in other districts—so that the whole world is found to be covered, as it were, with a variety of opinions and shades of opinions, like the diversified colours by which countries are depicted in a map. Opinion, we have said, is also dependent on temperament of the body. This is a melancholy truth. A fat and choleric man does not think in exactly the same way as a lean man. A man who enjoys all the comforts which opulence can purchase, has a tendency to think differently in some things from a man who is suffering under misfortunes or poverty. So strangely constituted is the principle which governs opinion, that most men have reason to alter their opinions on many points in their progress through life. They form an opinion in youth from which in manhood they depart, and form another; and this other they modify into something else as old age comes upon them.

What does all this wonderful contrariety of opinion teach us? Since we see that opinion is dependent on the locality of our birth, on the age in which we live, the condition in which we may chance to be placed, and on the physical qualities of our bodies, have we then no power over opinion? Must we be its slave? These are questions of a solemn character, and we must answer them soberly. The contrariety of opinion existing in times and places teaches us, in the first place, *humility*, which is the foundation of many heavenly virtues. It shows us that the opinions which we may form, particularly on abstract subjects, may possibly neither be the most correct nor the most enduring. Perhaps what we have taken up and cherished as our opinion may after all be a delusion. In learning a lesson of humility and distrust of our own style of thinking, we are impressed with a tender regard for the opinions of others—opinions which, most likely, have been taken up on grounds equally conscientious with our own.

Although opinion is commonly dependent on those contingent circumstances which we have noticed, it cannot be allowed that we have no power over it. We have a power over the formation of opinion to a certain extent, and it is our present object to show how this power can be exerted in order to enable us the better to fulfil the duties of life. The reason why opinion is so illusory in its nature, is, that mankind have ever been excessively careless in the adoption of their opinions. They are in the habit of picking up random ideas, which they mould into an opinion; and after having made up their minds, as they call it, on what *they think* is their opinion, they will listen to no explanation of the opinions of others. Their obstinacy, their self-conceit, their self-interest, their wish to please the party to which they have attached themselves, induce them to hold fast to their original opinion, until time or experience, in all likelihood, wear it down, and its absurdity is secretly pressed upon their notice. But even after its absurdity is disclosed, they are sometimes ashamed to say they have altered it; and so, perhaps, they have one opinion which they keep locked up in their bosom, and another which they bring into daily use, and flourish before company. In the apposite language of Scripture, these men war against the Truth.

It is our duty as good members of society, and with a view to self-respect, to be very cautious in the formation, and, most of all, in the display of our opinions. Many excellent men, on arriving at middle life, have deeply regretted that they should have heedlessly published their early and hastily-formed opinions in youth. They had reasoned, as they thought, soundly, but it was without a knowledge of the world, or of its history. Speaking to the young, we would say—while yet under the training of parents, guardians, and teachers, it is your duty to receive with confidence the instructions by which it is attempted to enlighten your minds, and to put you in the way of well-doing. But these friends of your youth will probably tell you that when you pass from under their guardianship into the active scenes of life, you become a responsible being—responsible alike to human and divine laws; and that you must now think for yourself. At this critical period of your existence, you have every chance of coming in contact with the idle, the dissipated, the frivolous, who will try to make you embrace erroneous opinions, and who will possibly put the most mischievous books into your hands for perusal. Do not be led away by such machinations; neither be dismayed by the number of wits or profane jesters who may assail you. Do your duty manfully. In order that you may attain a correct opinion on the most debatable subjects that you will hear rung in your ears through life, begin a course of reading those good authoritative works which intelligent friends will recommend to your notice. Take every opportunity of cultivating your understanding, of enlarging your ideas, of removing prejudices. Look always at the different sides of a question; for you must remember that there are many ways of telling a story. In proportion as you advance in your private studies, and acquire a knowledge of the passions and conduct of mankind, you will be more and more able to form a correct opinion. There is one thing which you will learn with surprise from this kind of experience, and that is, that many, though holding different opinions, are driving towards the same end in the main. They have only differed upon trifles, and perhaps fought about mere words. This is one of the strange weaknesses of the human race, into which you will find it difficult to avoid falling. The more that you learn, the more will you see cause to entertain a liberal view of the opinions of others. It is the exercise of this liberality of mind which forms a distinguishing trait in the manners of our country. By the British constitution, every one is allowed perfect freedom of opinion, a gift above all price, which it is our duty not to prostitute or abuse. Let us form our opinions on solid grounds of conviction—let us cherish these opinions to the adornment of our lives—and let us so maintain a due regard for the opinion of others that we show forth, in our feelings and actions, that most excellent of all virtues—Charity.

These observations apply indifferently to various subjects upon which opinions may be formed; and we would, in conclusion, beg to say a few words, in particular, on opinions of a political nature, which are the most difficult of all to be correctly formed. Political opinions are applied to the theory and practice of national government. The policy of national government is not an exact science to be learned, as some would imagine. It is more a fashion than a science. It is a thing dependent on time, place, and other circumstances. The form of government which suits one age or country would not suit another age and country. Some nations are best governed by a despotism, others by a mixture of monarchy and democracy, others by a pure republicanism; but, as we say, what is best at one time is not best at another. The genius and necessities of every people are subject to change, and consequently their governments change with them. If we feel the force of these facts, we will be cautious how we assume an unalterable opinion upon any mode of administering government. The young are particularly liable to take up notions on this subject which they afterwards feel inclined to fall from. We would admonish them to read and digest the history of their country, and reflect well upon the genius of the nation, before they come to a determinate opinion in politics. They will learn, as they advance to maturity, that in nothing is there such a mass of duplicity and affectation as in political matters. They are therefore called upon, by duty, to examine extensively, and probe deeply, the grounds upon which they form their opinion. They will find it much the safest course, as already expressed, to think lightly in the matter till they have had some experience of the world, and been convinced by the evidence of their senses. National exigencies sometimes call upon us to engage more deeply in politics at one time than another. Discretion must here be our guide; yet there is generally greater danger in our wasting much precious time on political disquisition, than in falling into an apathy upon public affairs. He is a wise man who knows how so to guide his steps as to preserve himself from falling into either extreme. Every one who has been for a long series of years politically busy, will acknowledge, that though he thinks he was right in the main (in which opinion he may be right or wrong), yet, that he has spent many busy hours and anxious thoughts on subjects, which, looked back upon, are seen to have been profitless and insignificant.

DUTIES WHICH THE PEOPLE OF ONE COUNTRY OWE TO THOSE OF ANOTHER.

It is seen that all the people of the earth belong to some one of the many nations with which it is covered. It is also seen that nations are generally separated from each other, not only by language, manners, customs, religion, and forms of civil government, but also by geographical boundaries. The division of mankind into nations is natural, and possesses obvious advantages. There is a limit beyond which the government of a nation cannot well be administered. By being confined within certain limited bounds, the national institutions may be improved, security and prosperity promoted, and the interests of the people advanced. We frequently find that the people of one nation live at enmity with those of another nation. We find many at open war with their neighbours—that is, they are resorting to brutal physical force to settle a dispute. These are evils deeply to be deplored. Nations have mutual wants, which a mutual intercourse and trade will obviate. They have similar interests at stake. Their inhabitants all alike belong to the great human family, and should live at peace with each other. But ambition, and many evil passions—strife, malice, and uncharitableness—are constantly in operation to retard their advancement towards a universal philanthropy. National war is the heaviest curse which afflicts humanity. It leads to enormous debts and taxations, and in reality is the beginning of all kinds of distresses among the people. Yet the people have been frequently very clamorous for war. We say *have been*, for we hope that this sentiment will in future be otherwise regulated. We ought to impress upon our minds a suspassing horror of war. Let us think of it as the scourge of the human race, and as one more destructive, physically and morally, than the most virulent epidemic. Were the inhabitants of countries duly impressed with these feelings, did they reflect upon the blessings which are showered upon nations during a lasting peace, they would henceforth resolve to oppose, by every constitutional means, the commencement of wars by their governments. Besides the actual loss of lives and of property to a nation during war, it is incalculable the injury sustained by society by such an infliction. A war of a few years' duration may retard intellectual improvement for a century. We hold, therefore, that it is the duty of every man to discountenance such a system of folly. He cannot be a lover of his country, he cannot be the friend of moral cultivation, who would countenance such an idiotic process of settling quarrels between intelligent nations. According to a rational view of men's condition in separate nations, war can in no case be reconcilable with social happiness, unless on the obvious principle of self-defence. So long as there remain such masses of ignorance over the earth, so long, we are afraid, force must be employed to preserve the little spots of civilization from the flood of barbarism which might overrun them. May it be anticipated however, that this urgent necessity will not exist much longer! How glorious would be the prospect, if universal peace were permanently established! We should find one nation instructing another in all the arts and sciences of which it was itself master; we should find an honourable spirit of emulation running through the whole; and all shaping their policy so as to promote the most beneficial intercourse in commerce, literature, and refinements. In the present state of things, as far as it can be accomplished, a kind and friendly international communion is a high and moral duty. It is our duty to look with an eye of charity on national peculiarities. We have no right to insult the feelings of the people of any nation, however strange their language, their fashions, or their customs may appear to us. We have, likewise, no right to taunt them with any apparently improper characteristics in their forms of government. It is our duty to consider them as entitled to live and act according to their own fancy, as independent, responsible beings. To write, print, and disseminate any scurrilous jests, tending to lower them in general estimation, is not only immoral, but inconsistent with the principles of honour, which do not permit any one to be struck who cannot defend himself. When we therefore insult a foreign nation by our obloquy, we commit the mean and cowardly action of injuring a party which has no means of redressing the grievance.

RECREATIONS AND AMUSEMENTS.

We have often had occasion to show, that this state of being is one of alternate action and repose. There must be serious action, and there must be amusements. It was intended that mortals should be pleased and happy, if they deserve to be so. Those who maintain that life is to be an uninterrupted scene of labour and gravity, are, we hope and believe, entirely mistaken. We discern nothing in the natural world, or in man's peculiar constitution or relations, which gives the least countenance to such an opinion. Amusement, like every thing else in which free agency is concerned, may be innocent and grateful, or improper, pernicious, and introductory of the worst of evils. Young persons must have the former, or they will seek out the latter. It is the duty and the

interest of parents to lead children to take pleasure in such things as can be approved of, and to divert children from such as must be injurious to them, and afflictive to those who are deeply interested in them. We apprehend that there may be persons, and classes of persons, who will disagree with us on this subject, as they may have done on some which have been already touched upon. We should deeply regret to displease any one; but on a matter so important as the making good citizens and good moral agents out of children, one should not hesitate to speak frankly and sincerely. If wrong, persons better able to judge will take care that no evil visits them in consequence of such error.

Amusements are physical or mental. It may be more proper to say, that there may be, first, amusements which are intellectual, and, second, such as consist of some bodily motion, in which the mind is more or less interested. If there be such distinctions, athletic sports may be of the second sort. The simple use of the eye, of the ear, and of the imagination, may be of the first sort. It is believed that all amusements must have some contemplated end or result, whether that be defined and certain, or contingent. We believe so, because every thing in this world seems to be moving on to some purpose. One who is acting without knowing for what, is neither labouring nor amusing himself, but is trying to get rid of himself, and of time. The most captivating sports are those which are contingent; that is sports or occupations wherein the result may be highly favourable or otherwise. No one engages in them without expecting to come out on the successful side. Hence, hunting, fishing, horse-racing, and gaming, are of this order. The hope of success is a very high excitement, but the mortification and distress of failure ever far exceed the pleasures of success. There is a tendency to discourage out-of-door sports. This is certainly wrong. If not carried to excess, they are among the most salutary and pleasing amusements in fine weather.

Every one admits that the mind and moral faculties are to be developed, and strengthened, and made to do the best, by exercise. This is equally true of physical power. Every action which it can be proper to do at all, ought to be done in the best way, otherwise we do not answer the end of our being. In the vegetable and animal departments, all proper care and cultivation tend to use and beauty. Is there any reason why the physical powers of man should not have care and cultivation to the same ends? Those who prefer a stooping, lounging, awkward, graceless figure and motion, may be on one side of the question; those who think it was intended that man should be an upright, easy, frank, comely, and convenient being to himself, and pleasant to all within whose observation he may come, will be on the other.

Although the frame of man is so made as to permit him to assume an endless variety of positions, and to apply his strength in all of them, he does, or should, return always to an upright position. No essential deviation from this position can possibly be a natural one, but for a temporary purpose. This is proved by the framing of the human bones. This framing shows, that, when one walks, it was intended that he should be perpendicular; if he walk in an inclined position, he has not only to move himself, but to resist the power of gravitation at the same time. The muscles, in such case, have a strained and unnatural duty to perform. It seems to have been intended, by the same sort of proof, that human beings should walk with the lower limbs, that is, from the hips downward, and not with an unmeaning and ungraceful action of the whole person, as is often seen to be done.

Dancing.—As to the best modes of acquiring strength, ease, and grace, there may be very different opinions. There are many who think the discipline of *dancing* a proper mode, and others who think this highly improper. We would not run against any opinions, whether well or ill founded. But as to dancing, just like every thing else, it may be misused and perverted, or be made to be an innocent, healthy, and commendable accomplishment. There is no mode so much within the reach of the community, in general, as this. Properly taught, it brings out the power of the muscles, and gives them their natural action: all natural motion is graceful. Why should not man conform to this general law of nature? Dancing well is one mode of conforming. Possibly it is considered frivolous and corrupting. Nothing is frivolous in this system of being which is innocent, pleasing, and adapted to promote healthy action. Persons who are capable of being corrupted by dancing, will certainly find some much more effective mode to become so, if this be denied to them. Dancing among the very young is usually conducted under the eye of discreet seniors, and well-educated adults need no supervision in dancing, but that of good sense and their own self-respect. But suppose dancing could in any case be perverted, so may every thing else be. If we are not to do any thing till it is impossible to err in doing it, what will there be for any one to do?

Music.—It is one of the most convincing proofs of the benevolence of the Deity, that he has so formed the human ear as to make it capable of finding a rational and elevated pleasure from the action of sound. There might have been organs of speech, and ears to hear, without imparting to the ear the power of knowing and delighting in music. It must have been intended that this gracious gift should be used, and (most probably) as one mode of praise and thanksgiving as well as for innocent pleasure. Music is action; it is action to some end; the end is innocent and delightful. The enjoyment has the double advantage of being solitary and social. Music may be made to produce a sense of high moral feeling, and it may be made to produce a feeling of very opposite character. The same rules must be applied to this subject as to all others, that every thing was created, and for some good and wise purpose; and that every thing must act, and will act, to some useful end, if human ignorance or error do not interfere. We therefore contend that the power to make music is to be cultivated, and its benefits to be thankfully enjoyed.

It is consistent that man, as he is so superior to all other animals, should be alike superior in the making and enjoying of musical sounds. He undoubtedly is so. His voice (it would be more proper to say woman's voice) includes all the sweet sounds which can be made by all other animals. He has, by cultivating this power, by applying the atmosphere through the human lungs, and by delicacy of touch, end by bringing substances in contact with each other, and by sending the wind through that wonderful work of his own hand the organ, found the means of rendering tribute to the Most High, and of softening and purifying his own heart. No doubt, music was given to mortals for their amusement, and that it is their duty to take it in that light, and be thankful for it.

Games.—Games at cards are a very common amusement. They may be innocent, but there is nothing to recommend them. They give no action to the body; they are a very humble occupation for an intelligent mind. Whether the chances in distributing fifty-two pieces of spotted pasteboard fifty successive times in three or four hours, shall possess some of the engaged with fortunate pieces, and others with unfortunate ones, can hardly be said to be doing any thing to any useful end. When the sport is over, the thing proved or arrived at is, that in this use of three or four hours of a short life, A. counted so much, and B. so much. This, however, is not the end usually proposed in playing cards. The cards are only the machinery which, with more or less skill, submits to the laws of chance the result of emptying one

man's pocket and filling another's. A passion for this kind of gaming extinguishes, or converts into a withering curse, every fine feeling of the human heart. Time, health, property, the proper use of the tongue, character, self-respect, and peace of mind, are the sacrifices made at the gaming-table. Unnoticed by the miserable victim, the shackles of habit are put on, which no earthly power can unrivet. When the gambler's last shilling is gone, he starts, as from a dream, into a full sense of the complicated misery and ruin in which he has involved himself. He must then devote himself to infamy, and submit himself to the power of a gravitation which will bring him inevitably to the bottom of its abyss. The evils of gaming may be judged by the number of suicidal deaths which it occasions, especially in the great cities of Europe.

All gaming for property leads, in proportion to its character, to such results. The means of gaming, and especially with cards (as they are the easy and most common implements in use), are regarded with the abhorrence which is associated with them by all persons who feel an interest in the young. The young and the middle-aged have no need of cards for amusement. They may have many amusing occupations which are innocent and improving. There may be persons in an advanced time of life, who are beyond the seduction of gaming, to whom the interest of a game of cards may be an innocent and welcome amusement. Undoubtedly, friends who are met for social purposes, and who have nothing better to do with their time, hands, and minds, may play cards in a manner to give no offence to themselves or others. But it is pleasing to know that the state of improvement is such, that in most social meetings there are higher entertainments than that which cards afford, and which are justly in higher esteem.

There might be games, one would think, adapted to amuse children, and to be at the same time innocent and useful ones. Whatever they are, they must be consistent with the principle which requires a beginning, an interesting succession of circumstances, and a result worth attaining. Children must be busy. To require of them to be still, is to require what nature has forbidden. To place a child on a hard bench, and tell him to sit still there two or three hours, without any employment for his hands or mind, is as great a violation of natural law as to require of him to stand on his head for the same length of time. There is an obvious want in the means of amusing children; and we apprehend that it arises from disregarding the principles on which the construction of physical and intellectual being rests. If there were an extensive workshop, provided with every variety of tools, with a proper superintendent, to which boys might resort on some proper arrangement, and where they could make articles for themselves, there can be little doubt that it would be diligently frequented. The reason is, that their little efforts would be to some end, and by natural means. On the other hand, the gymnastic machinery is fallen into disrepute. These exercises are uninteresting repetitions to no end, except with those who know that bodily motion must be had to secure health. In such case they endure the labour for the end in view. But the amusements of the young must be of a nature to secure action to an innocent and useful end, and health will take care of itself. Perhaps there may be some persons who can follow out this matter, and invent rational amusements. They would deserve to be regarded as benefactors, and would probably find a substantial reward. We cannot but remark that there is one game, which is one of the most interesting and healthful that can be played—that of tennis, or handball. There are many things to recommend it; and among others, it is one sufficiently interesting to be played for itself, without adding to it the zest of winning or losing any thing but the game. We incline to think that it is the game, of all others, which deserves the patronage of colleges and seminaries, and is well adapted to develope the physical force.

Conversation.—The principal amusement of rational people is the interchange of thoughts by speech or conversation, which word is made out of the Latin words *con* and *versor*, and means literally *to be turned to* or *with*. The principle of this amusement is found in the law of association of thought. Intelligent persons can always make a conversation. The only difficult step is the first; that ought not to be so considered. Persons who are skilled in the art of talking can always give it a direction. The purposes of conversation are to put one's self in the way of learning something; to impart something that others want to hear; to form opinions on interesting subjects; to settle the merits or demerits of public action; to recount amusing or extraordinary facts, &c. &c. Every human being knows something which he is willing to tell, and which any other that he is in company with wishes to know; or which, if known to him, would be amusing or useful. To be a skilful conversationist, one's eyes and ears should be busy; nothing should escape his observation. His memory should be a good one, and he should have a good-natured willingness to please, and to be pleased. It follows that all matter of offence in conversation should be avoided. The self-love of others is to be respected. Therefore, no one is tolerated who makes himself the subject of his own commendation, nor who disregards the feelings of those whom he addresses. There is as much demand for politeness and civility in conversation as in any other department of social intercourse. One who rudely interrupts another, does much the same thing as though he should, when walking with another, impertinently thrust himself before his companion, and stop his progress. Under favourable circumstances, and among persons who know how to train a conversation, there are few if any amusements more grateful to the human mind. We need not say any thing of the amusement derived from reading. It is very properly one of the standard amusements of persons of all ages. The influence of the press on the character of a country is not to be measured or calculated. It is strikingly true of this admirable invention, as it is of so many other things in natural and moral agency, that, *well used*, it is an inestimable blessing; ill used, the corrupting demon of social life. Happily, attention to the proper wants of the young has required of the press its action for their benefit; not as to books of study only, but sheets of amusement.

RELIGIOUS OBLIGATIONS.

Religion signifies a system of faith and worship. Religion arises from man's perception of his relation to the system of being of which he is a necessary part. The presence and influence of religion is to be felt and manifested throughout the duration of human life, in all that is thought and done, with a view to a happier and more perfect state of existence after death. Just conceptions of the character and attributes of the Deity are of the utmost importance, especially to the young, whose minds require to be led aright in all that pertains to the great truths of religion. The religion professed in this country is Christianity—the most cheering, the most noble of all faiths. The books to which we point for instruction in the religion of Christ are those of the Old and New Testament. To them the instructors of the young will direct the religious studies of those under their charge, as may best seem fit. Besides inculcating religious obligations, these works furnish us with the most perfect system of moral duty ever promulgated. The sum of the earliest delivered moral law is comprehended in the Ten Commandments, which are as follows:—1. Thou shalt have no other gods before me.—2. Thou shalt not make unto thee any graven image, or any likeness of any thing that

in heaven above, or that is in the earth beneath, or that is in the water under the earth: Thou shalt not bow down thyself to them, nor serve them: for I the LORD thy God am a jealous God, visiting the iniquity of the fathers upon the children unto the third and fourth generation of them that hate me, and showing mercy unto thousands of them that love me, and keep my commandments.—3. Thou shalt not take the name of the LORD thy God in vain; for the LORD will not hold him guiltless that taketh his name in vain.—4. Remember the Sabbath-day, to keep it holy. Six days shalt thou labour, and do all thy work: But the seventh day is the Sabbath of the LORD thy God; in it thou shalt not do any work, thou, nor thy son, nor thy daughter, thy man-servant, nor thy maid-servant, nor thy cattle, nor the stranger that is within thy gates: For in six days the LORD made heaven and earth, the sea, and all that in them is, and rested the seventh day: wherefore the LORD blessed the Sabbath day, and hallowed it.—[By the practice of Christians, the Sabbath has been transferred to the first day of the week.]—5. Honour thy father and thy mother, that thy days may be long upon the land which the LORD thy God giveth thee.—6. Thou shalt not kill.—7. Thou shalt not commit adultery.—8. Thou shalt not steal.—9. Thou shalt not bear false witness against thy neighbour.—10. Thou shalt not covet thy neighbour's house, thou shalt not covet thy neighbour's wife, nor his man-servant, nor his maid-servant, nor his ox, nor his ass, nor any thing that is thy neighbour's."

Such was the sum of the moral law, until Christ added to it a number of the most transcendently excellent admonitions, and which are found scattered throughout the history of his ministrations in the four gospels in the New Testament. The chief moral which he inculcated was, "Whatsoever ye would that men should do unto you, even so do unto them; for this is the law and the prophets." But the whole of his sayings breathe a similar spirit of benevolence and gentleness. He preached for the first time that it had been done on earth, the doctrine of "peace and good-will towards men;" that is, universal love and peace among all mankind. "Ye have heard," said he, "that it hath been said, Thou shalt love thy neighbour, and hate thine enemy: but I say unto you, Love your enemies: bless them that curse you: do good to them that hate you: and pray for them which despitefully use you and persecute you." Again, he said, "Blessed are the poor in spirit, for theirs is the kingdom of heaven: blessed are they that mourn, for they shall be comforted: blessed are the meek, for they shall inherit the earth: blessed are they which do hunger and thirst after righteousness, for they shall be filled: blessed are the merciful, for they shall obtain mercy: blessed are the pure in heart, for they shall see God: blessed are the peacemakers, for they shall be called the children of God: blessed are they which are persecuted for righteousness' sake, for theirs is the kingdom of heaven: blessed are ye when men shall revile you, and persecute you, and shall say all manner of evil against you falsely for my sake." In this manner he taught the great necessity for being humble and lowly in spirit as the basis of all virtue and social happiness. He likewise inculcated, at different times, the necessity of putting away every thing like ostentation in doing good actions. He tells us not to give our alms before men, but to bestow them in secret; not to pray ostentatiously in public, but in a private place. No one, until he appeared, ever pointed out that there was no difference betwixt actual transgression and the wish to transgress. He tells us that sins of the heart are equally punishable with the commission of an offence. He likewise taught that men "cannot serve two masters," that is, do evil actions, however apparently trivial, and at the same time be good men. To break "the least of the commandments" is to be reckoned equivalent to breaking the whole; and it is further said, it is impossible that our oblations to God can be accepted of so long as we live in enmity with a brother; that is, having a quarrel with any one. "Leave thine offering before the altar, and go thy way; first be reconciled to thy brother, and then come and offer thy gift. Agree with thine adversary quickly whilst thou art in the way with him." Who among us, may we ask, keeps this saying in remembrance? Do all who attend the public worship of God hold it in mind?

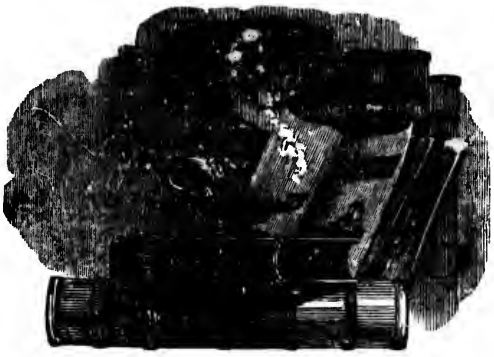
Again, he says that we are equally to avoid hypocrisy, or a pretence of self-righteousness and ability to show our neighbours their faults, before we have put away the same or other faults from ourselves. "Hypocrite, first cast the beam out of thine own eye, and then thou shalt see clearly to cast out the mote out of thy brother's eye. Judge not, that ye be not judged." How valuable are these reproofs! Continuing to admonish us of the danger of hypocrisy, he says that we shall know men by their fruits; that is, we shall know them by their actions, not their words. "A good tree cannot bring forth evil fruit, neither can a corrupt tree bring forth good fruit: therefore by their fruits ye shall know them. Not every one that sayeth unto me, Lord, Lord, shall enter into the kingdom of heaven; but he that doeth the will of my Father which is in heaven." We are likewise told that there must be no stop to the extent of our forgiving of injuries. Being asked if we should forgive an injury for seven times, he said to those about him, "I say not unto thee, until seven times, but until seventy times seven;" by which we are to understand that there is to be no limit to our forgiveness. Three things, we are told by St. Paul, are essential—Faith, Hope, and Charity, but that the greatest of these is Charity, or a disposition to think well of our neighbours whatever may be their actions. It is also variously inculcated that charity is the first of the Christian virtues. Personifying it, it is said, "Charity suffereth long, and is kind; charity envieth not; charity vaunteth not itself, is not puffed up, doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil; rejoiceth not in iniquity, but rejoiceth in the truth; beareth all things, believeth all things, hopeth all things, endureth all things."

CONCLUSION.

We have now given an elucidation of what we consider to be the principal duties we are called upon to perform during life, both to ourselves and to others. The subject is by no means exhausted, yet enough has been said to afford human beings a view of what line they ought to follow in the pursuit of individual and social happiness. The object we held in view has been accomplished. We have, to the best of our ability, put young and old, high and low, rich and poor, *in the way* of executing their temporal duties. We hope we have shown that if man be not a happy, a grateful, a satisfied being, he must accuse himself, and not complain that the system of being to which he belongs is wrong and malevolent. We have attempted to prove that man, individually and socially, is capable of improvement; that he has removed himself from his original condition, and has advanced far in disclosing his own powers, and in applying them in the promotion of his own happiness. But it has to be added, that he has still much farther to go in the same course, that the way is known to him, and that there are no obstacles in it which he may not remove. We do not believe in the perfectibility of mankind. The crimes and follies which affect even the most cultivated of our race, tell us too plainly that there is a natural bias towards evil, which it requires the utmost skill on the part of religion and reason to counteract. The passions ever seem to stand as a barrier against human perfection, and it is only by their due regulation that we can gain so much as comparatively worldly happiness. Yet it is incalculable to what extent the exaltation of the mental faculties may be carried by systems of education, an

to what extent the community may be purified of its vices. Let us hope that nothing may occur to interrupt the physical, the intellectual, and moral improvement of society, which is now so happily in the way of advancement.

NOTE.—The former article was an abstract from the Moral Class-Book of Mr. William Sullivan, a work published at Boston, in the United States. The present is partly original, and partly selected from the same production. The heads in the present article, Duties as Subjects, as Electors, as Jurors, as Masters and Servants, Conduct at Public Meetings, Making a Will, Misfortunes and Evils, Inequality of Rank, Duties which the People of one Country owe to those of another, Duty of Trusting to Ourselves, Religious Obligations, and Conclusion, are the composition of one of the Editors, as also a number of passages in other places. It is humbly trusted that both numbers will be found to form the most complete as well as the most applicable body of admonition on the moral duties ever given to the public; and that parents and teachers of youth will find it available in their purposes of intellectual cultivation.



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