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THE

CANADIAN AGRICULTURAL JOURNAL.

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No. 9.

There never was a greater mistake than that of attributing the destitution of the poor of the British Isles to the operation of the Corn Laws of England, or to expect that by the repeal of these laws alone their condition will be much improved. We have no doubt that were all restrictions on trade completely removed, the general condition of the working classes would soon be improved, but not by any partial measure short of free trade, in every article of consumption both for rich and poor. This would give full scope for employment of capital and labour, without any check or hindrance. We do not see how it will be possible to establish this free trade, and find sufficient revenue to meet the demands that must ever be for it, but we are perfectly certain that when agricultural protection is at an end, nothing short of complete free trade will be just towards all classes, and interests. It is the greatest absurdity that can be imagined, to attempt to discuss the circumstances of the English and Irish poor, or the means of improving their condition, by persons who never were in those countries, and in fact, know no more about what they pretend to understand perfectly, than they do of the inhabitants of the most unknown parts of the earth. The people of this continent who never saw the old world, will understand their own affairs much better than it is possible for them to understand the circumstances of the old countries or their inhabitants, and it will be their wisdom to let these matters alone, if they wish to be considered as possessing common sense.

The general requisite for improving the condition of the poor of the British Isles, is to give them constant employment, at fair wages, and we have never known a free trader who was not an advocate for employing machinery instead of manual labour. This would be all very well provided those thrown out of employ by machinery, were supported on the profits that are derived from the use of machinery. But were we to discuss this subject in all its bearings, it would fill a large volume, and therefore we shall simply state again, that all advocates for the abrogation of the Corn Laws, should also advocate as honest men, free trade in every other article as

well as the productions of agriculture. Every article which we think necessary for our use and comfort, should be as free from restrictive duties as the products of agriculture. The poorest labourer in the country would think himself most unjustly treated were he restricted from buying tea sugar, coffee, wine, spirits, beer, &c., and yet all these articles are highly taxed, while the direct products of agriculture have no protection. In like manner, every article we require for clothing is taxed indirectly. Let all restrictions be done away, or retain all. The allotment system is another of the remedies proposed by theorists, as a cure for all the evils the poor are subjected to in the British Isles. We have no objection to the allotment system, but it would be impossible to carry it beyond a certain extent, and that not a large one. We might as well propose to the proprietors of land in the old countries to give out all these lands in small allotments, and the next move will be to make these allotments, the property of the occupiers. In Ireland the small farm system has been carried so far, that, for several years, past it has been a principal object of the proprietors of estates to enlarge the farms as the only means to insure the payment of rents. There is a certain proportion of mankind throughout the world, that must be always employed in producing for themselves, and for the other portion, and if the small allotment system was carried too far we might as well parcel out the whole of every country into small allotments and let every man cultivate what he may require for himself. We are not of the number of those who would wish to see the world turned upside down. Necessary and expedient improvements may be introduced, but it is not necessary to upset every thing. It is easy to make changes, but these changes may not be improvements. We wish to see every one who is dependent on his labour, have full employment, at wages sufficient for his support, and this we conceive to be the true and best means, to improve the condition of the working classes. The world is so constituted that labour is necessary to our very existence, and in fact there is scarcely an individual who has not to work in some way, with his

hands, or in directing the labour of others. Theorists write as if the abolition of the English Corn Laws was to give comfort and abundance to all the working classes, and to the poor of the British Isles. It is however, a great mistake. If all restrictions on trade were done away, and revenue raised by direct taxation this would benefit the labouring classes and poor, certainly, because the payment of this revenue would fall upon the possessors of property and wealth. We see no possibility of a proper and equitable adjustment of this question of free trade, unless it is carried out to the full extent, and it will be for those who introduced the principle, first, to propose means of raising revenue in a way not objectionable. It is absurd to say that the duties on certain articles are merely nominal, and produce no revenue. If they produce no revenue why subject them to the payment of duties? We should never have proposed the recent changes in the Custom House-laws; but now that they have been adopted, we demand in justice that they be still further changed so as to do them away altogether, and allow agriculturists to purchase in as free a market as that in which they have to sell their own products. This is the principle for agriculturists to advocate. It may be thought that the state of the poor in the British Isles is a subject we have nothing to do with. We conceive, however, that as a province of the British Empire, we are deeply interested in the matter, particularly as this country is the great outlet for the reception of the surplus population and the poor of the British Isles.

ON THE NECESSITY OF AN IMPROVED SYSTEM OF AGRICULTURAL EDUCATION

TO THE EDITOR OF THE MARK LANE EXPRESS.

Sir,—In the present posture of agricultural affairs in this country, a few observations on the necessity of a more extended education for the agriculturist may not be out of place.

Leaving to your talented and powerful pen, the advocacy of those social rights of the farmer, included under the comprehensive head of "TENANT RIGHTS," I shall endeavour in this letter to shew that the general education of the farmer is not adapted to the present times; and that it is deficient in all those elements of power, which alone can enable the agriculturist fully to cope with the competition to which he will inevitably be exposed.

Though there are many honourable exceptions, yet the generality of farmers are contented if the education of their children enable them, simply to read, write, and cypher; these *operctious* having constituted the staple of the education of the parents themselves. Not one in a hundred thinks that these very studies, though good enough to begin with, are only the means whereby we may acquire an education, and that they do not constitute the education itself. Read-

ing and writing enable us to extend our knowledge; they are new senses given to us. But what would be the use of reading, if not to obtain knowledge? what the use of writing, if not to convey truths, information and advice; these means therefore, to an end, ought not to be taken at more than their proper value, but ought to be estimated in proportion as they give us the opportunity to extend further our researches into the nature of these objects which exist around us. But when do we, in general, find in the education of the agriculturist one particle of information respecting the nature of the soils he works upon, its composition, its chemical and mechanical properties? Where do we find that the nature and constitution of the vegetable kingdom, occupy the agricultural mind? How often and when is inculcated, the necessary conditions for insuring health in domestic animals, or the effects of different kinds of food on the animal frame and constitution?

While, however, it is a matter of lamentation that neither in the education of the young farmer, nor in the practice of the old, is a systematic knowledge of nature brought to bear for the production of his crops, let us turn to the manufacturers, and see if they have been equally remiss, or whether a great lesson may not be learnt from the mode in which the manufacturers have conducted their business, and the vast results they have obtained. Have they been equally with the farmer neglectors of scientific improvements?

On referring to the history of the arts and manufactures of this country for the last half century, we find that there is scarcely a single business which has not received transcendent benefits from the application of mechanical science and chemistry. Irrespective of the discoveries of Watt and Arkwright, the application of chemistry to many operations in the arts is the foundation of the great superiority possessed by the manufacturers of this country over those of her neighbours. In the process of bleaching, for example, the application of a simple chemical discovery, produced the greatest revolution that can well be imagined. It was discovered that a substance called chlorine (contained in chloride of lime) possessed the property of bleaching vegetable colours in a few minutes. The celebrated Professor Copland of Aberdeen, proposed to us chlorine for the bleaching of linen and cotton goods; after meeting with the amount of opposition which new discoveries usually encounter, the new process was universally adopted. By the old method, the goods required from eight to ten months to bleach: they are now bleached in a day. This discovery lies at the foundation of the prosperity of the calico-printing and manufacturers of this country. If the old method had yet to be pursued, it would be impossible to print one hundredth part of the calico now printed, and the price would be indefinitely augmented. The advantages of these improved processes are no doubt well estimated by the ladies, who can obtain printed dresses *far cheaper* and better now than even twenty years since.

In the metallurgic art the use of chemistry has also been great. New ores of metals have been discovered, old *slags* have been remelted, and made to furnish an additional quantity of metal; and methods have been discovered of obtaining metal from ores, which previously had resisted all the old processes.

Dyeing, tanning, sugar refining, and a thousand other operations have received immense aid from chemistry, and shew by their present prosperous condition the value of the assistance so rendered.

How many there are now living who remember the ridicule which was at first excited by the proposal to

light the streets and shops by the chemists' "philosophical couple?" and yet now the lighting by gas has extended from one extremity of the civilised world to the other, and poor indeed is the town, or even large village, which has not its gas manufactory. And shall the farmer be the only one who shall refuse to avail himself of benefits open to all? Is it possible that he will any longer refrain from making himself acquainted with the truths of science, that he may apply these truths with success to the cultivation of the soil? I think not, for even the few improvements introduced into the art of farming, have already been productive of immense benefit, and sufficiently show what we might expect from their more extended application.

It has been well observed by Liebig, "that from science some further improvements in agriculture are to be expected." And indeed to those who compare the present state of agriculture with that of our ancestors, the aid given by chemical and mechanical means to the amelioration and better cultivation of the soil, will be readily apparent. These improvements, and the practical skill of the British farmer, have placed him far in advance of the cultivators of the soil in any part of the world. But if he would retain the proud position he has gained, he must not in our days of railway progression, rest satisfied with his present superiority. He must continue to avail himself of all that science can suggest, and prudence can perform; and above all, he must see that his youthful successors are well and early instructed in the principles of science and of chemistry.

Agriculture is a science as well as an art, and must depend for its successful pursuit, not only upon the information acquired by a practical pursuit of the subject but likewise upon the knowledge of the structure, functions, and properties of vegetables; upon the knowledge of the different geological strata of different districts, of the various mineral ingredients of each of these strata, together with a thorough acquaintance with the substances required, cannot be obtained without the study of botany, geology, and chemistry.

It might be objected that the farmer has no time, engaged as he is on his farm, to study these sciences. Though these observations may have some little force, yet, even with the farmer, time might easily be found for mental improvement. If less time were spent upon noisy dogs, and dangerous guns, mental opportunities would speedily increase.

But my object is chiefly to show the necessity of educating the young agriculturist in a suitable manner, and to prove that all the objections to a study of science are equally futile.

In the education of youth destined for agriculture, botany, geology, and chemistry ought to form a prominent part; a thorough knowledge should be given of the nature of all the chemical elements which occur in the soil, in the air, in water, and in the animal and vegetable kingdoms in general; practical instructions should be given in properly and conveniently constructed laboratories, in the various methods of analyzing minerals, soils and manures; and the methods of detecting and weighing every thing removed by the crop should be perfectly known.

We often hear persons unacquainted with the proper mode of teaching chemical science, object that it is impossible to cause young persons to acquire that practical knowledge of analyses, which shall enable to ascertain by weight the various ingredients in crops, manures, guanos, &c. We wholly differ with these persons because we have in our laboratories practically proved the contrary. Many of our youths have performed analyses of various substances with an accu-

cy that would not disgrace men double their age. Many of these analyses have been already published in various journals, and give the best evidence of the advancement of these young chemical students. In confirmation of these remarks, I subjoin the following original analyses, selected from many others performed by one or two of our pupils in the Session from January to June, 1845. It must be observed, that these youths had likewise to attend to their studies of the mathematics, classics, and modern languages.

I.—Analysis of the inorganic matter of farm-yard manure.

	Farm Yard Manure from Kent.	Farm Yard Manure from Surrey.
Per centage of Ash.....	9.2	7.6
Silica.....	72.79	71.32
Potash.....	3.32	5.14
Soda.....	0.92	1.68
Lime.....	6.90	12.22
Magnesia.....	0.56	0.82
Common Salt.....	1.43	1.22
Phosphate of Iron.....	2.04	2.03
Phosphate of Alumina.....	1.53	2.54
Sulphuric Acid.....	1.89	1.57
Phosphoric Acid.....	1.58	1.27
Manganese.....	a trace.	
ALLEN AND GREENHILL.	99.96	99.91

II.—Analysis of two samples of Guano.

	Peruvian Guano.	Ichaboe Guano.
Moisture.....	15.50	25.50
Ammonia.....	12.85	9.60
Organic Matter.....	39.95	32.40
INORGANIC MATTER.		
Silica.....	1.30	.44
Potash.....	3.21	4.19
Soda.....	.48	.34
Chloride of Sodium.....	2.03	1.61
Lime.....	17.51	11.55
Magnesia.....	.39	.83
Phosphate of Iron.....	.65	.48
Sulphuric Acid.....	.42	1.06
Phosphoric Acid.....	6.38	11.83
ALLEN.	99.97	99.83

III.—Analysis of peat and wood ashes from Farnham.

	Peat Ashes.	Wood Ashes.
Silica.....	5.50	4.25
Sand.....	46.10	10.00
Charcoal.....	16.85	.35
Lime.....	5.35	29.05
Magnesia.....	.10	6.65
Potash.....	...	7.55
Soda.....	...	4.89
Chloride of Sodium.....	.40	.80
Chloride of Potassium.....	.60	...
Sulphuric Acid.....	3.25	3.25
Phosphoric Acid.....	.60	4.70
Carbonic Acid.....	2.50	25.00
Phosphate of Iron.....	...	2.50
Oxide of Iron.....	13.50	...
Phosphate of Alumina.....50
Alumina.....	4.40	...
Manganese.....	...	a trace.
ALLEN.	99.15	99.40

The proof of the possibility, therefore, of giving chemical knowledge to boys is perfect; and in addition

I have always observed that the effect on youth of an early inculcation of scientific truths, is to enlarge their minds and quicken their perceptive faculties.

No one, I think, will be rash enough to deny that if a youth, thus prepared by a scientific education, be set to learn farming with a first-rate practical man, he will, when he has to commence the world for himself, be far more likely to succeed in the good management of his farm, the preparation of his manures, and the fattening of his cattle, than the *merely practical* man who cannot give a reason for a single operation which takes place on his farm.

I have been induced to trouble you with these observations from having remarked that many persons really have a most indistinct idea of what chemistry, if acquired, is capable of performing; while others really believe it is an almost superhuman task for either man or boy to master the hard words, and obtain even a smattering of science. I trust I have shown to unprejudiced minds the fallacy of both these suppositions, and I feel assured that by means of a good scientific education the great cause of agricultural improvement will best be supported and enforced.

In conclusion allow me to recommend to agriculturists desirous of self improvement, the perusal of "Liebig's Letters on Chemistry;" Professor Low's "Practical Agriculture;" Professor Johnstone's "Lectures on Agriculture," Chemistry and Geology;" Thiers' "Principles of Agriculture," translated by Shaw and Johnson; and, as a book for the hands of young children, Johnson's "English Rural Spelling Book."

I am, Sir, your obedient servant,

J. C. NESBITT.

Agricultural and Scientific Academy.
Kennington Eane, London, July 1st, 1846.

The Bee-keeper's Manual, or Practical Hints on the Management and Complete Preservation of the Honey-Bee, by Henry Taylor. Third Edition, corrected, improved, and additionally illustrated. London: R. Groombridge and sons, Paternoster Row, London.

We have several times been called upon to afford information to our readers upon subjects connected with that delightful and profitable employment, "*Bee-keeping*," but we have hitherto been unable, from a pressure of other matter, to reply to their queries. Here, however in an exceedingly neat and well got up pocket volume, Messrs. Groombridge and Sons present us with the result of much observation, on the part of Mr. Taylor, who, as an amateur apiarian, gossips pleasantly on the habits and mode of feeding and keeping those especially useful and interesting insects, Bees—interesting not merely because of the important industrial lessons which, in common with the ant, they teach, but because their economical arrangements are so highly instinctive. To shew our author's mode of handling his subject we take the following on the various members of the Bee family or commonwealth:

To those who may be acquainted with the natural history of the domestic honey bee, it may be well as a preliminary remark to say that in every family there are three kinds; a queen or mother bee, the common or working bees, and (during a part of the year,) the male or drone bees.

In a community thus constituted, they dwell together in great harmony, working for the general good, recognising one another, but permitting the intrusion of no stranger.

THE QUEEN OR MOTHER BEE is very rarely to be seen: she is larger, longer, and more taper than the

common bees, has shorter wings, and is of a yellowish brown colour underneath. She is armed with a sting, and reigns supreme in the hive, admitting no rival or equal. Where she goes the other bees follow; and where she is not the others will not long remain. A queen has been known to live four or five years; she is the mother of the colony, laying the eggs from which all proceed, whether future queens, drones, or workers. Separate her from her subjects, and she speedily resents the injury, refuses food, pines, and dies. Without a queen, or the prospect of one, labour is suspended, and a dispersion of the colony ensues. To provide for death or incapacity, preparation is made for a successor, and at the proper season young queens are to be found in various stages of maturity. They are not bred in the hexagonal cells of the common bees, but in much larger ones, which when complete, present the appearance of an oblong spheroid, generally appended to the sides of the combs, the bottom being downwards. They vary in number from five or six to a dozen, and sometimes more. The eggs intended to produce future queens are laid after those of common bees and drones, the young princesses arriving at maturity on the sixteenth day. These are successively cast out of the hive if not required; but it is a well-established fact, that in case of an emergency the bees have the power (provided there is a broodcomb in the hive at the time) of creating a queen. They select one of the grubs in a certain stage, enlarge the cell that contains it, and by a *different kind of nurture* a sovereign is reared, and all goes on as usual.

THE COMMON OR WORKING BEES are the least in size, and in point of numbers are variously calculated at twelve to twenty thousand, according to the bulk of the swarm; though at certain times they are much more numerous. As regards sex, from the observations of naturalists, there is every reason to believe they are undeveloped females; and, like the queen or mother bee, each has the power of stinging.

Workers' eggs are deposited in the cells in the centre of the hive, being those first laid by the queen; and are about the size of such as are produced by a butterfly. In four or five days they are hatched, remaining in the larva or grub state four to six days more, during which time they are assiduously fed by the nurse bees. They then assume the nymph or pupa form, and spin themselves a film or cocoon, the nurses immediately after closing them up with wax. On the twenty-first day from the laying of the egg a perfect bee bursts its confinement. It is speedily cleaned by its companions, and in a few hours has been known to be gathering honey in the fields.*

The working bees have their respective occupations some in secreting and elaborating wax, and constructing the cells in the hive; others in warming the eggs, and rearing the young brood; in attending on their queen, to whom they are devotedly attached; in guarding and giving notice of attacks or annoyance from without; and the rest in searching the fields and woods for the purpose of collecting honey and farina for present and future store. The working bees are short-lived; there being no reason for believing that they survive a year; but, on the contrary, it is shewn pretty clearly by Dr. Bevan and others that six or seven months is the limit of their duration.

* As soon as the young bee comes forth, the others clear the cell from all impurity, and it again receives an egg; this being often repeated four or five times in the season. Afterwards the cell becomes a receptacle for honey; but with all their attention, the cells are found in time to become thickened by this rapid succession of tenants. When this takes place it is best to remove the combs, which will soon be replaced with new ones, by the bees.

THE DRONE OR MALE BEES are computed in the spring at one or two thousand and upwards, in every good stock hive. They are larger than common bees; have no sting and are easily distinguishable by their louder humming or *droning*. The drones take no part in the collection of honey, nor in any other operation of the hive.

Drones eggs are laid by the queen in cells larger and stronger than those intended for common bees, and further removed from the centre of the hive. They pass through their various stages in about twenty-five or twenty-six days, the drones being seldom seen till about the beginning of May, and then only in warm weather, in the middle of the day.

Of all theories on the subject of the part allotted to the drones in the constitution of a hive of bees, (and some of these have been sufficiently absurd,) that of Huber is undoubtedly the true one,—the impregnation of the young queens. Perhaps the annual destruction of the drones by the workers is the operation most likely to throw light on the design of their creation. This process varies in point of time according to circumstances. Deprive a hive forcibly of the young queens, and, according to Bonner and Huber no expulsion of drones takes place. They are retained in case of need, for other queens may yet be produced. Where swarming has become unnecessary, as in ventilating hives with abundant space, the young queens are cast out voluntarily by the bees. Then frequently commences an early expulsion of the drones: they are rendered useless, become merely consumers of the wealth of the community, and as such are driven ignominiously from the hive, to perish miserably, not one surviving; not even those in embryo allowed to escape. This warfare often commences in such hives in the middle, or at any rate towards the end of May, as I have witnessed.† On the contrary, in the common swarming hives this process does not take place till July or even August. The circumstances differ in the two cases; and the bees in this, as in other parts of their practice, are sufficiently utilitarians to modify their proceedings accordingly. In one instance the service of the drones are probably not required at all, and a speedy sacrifice follows; in the other, young queens are left successively to come to maturity. These, once impregnated, become fruitful, perhaps ever after, as in the case with some other insects; at all events for a year, for eggs are laid by them, and young produced, without the presence of a single drone, except during a few weeks in that period. The destruction of the drones, therefore, may generally be considered an indication that no swarming is meditated by the bees. Dr. Bevan, in his work entitled the "Honey Bee," observes, that "the number of drones may be considered as in accordance, in some degree, with the general profusion of nature: we find them abounding with supernumeraries in a great variety of instances, in the blossoms of trees and flowers, as well as in the relative number of one sex to the other among animals. Huber conceives that it was necessary there

† Bagster, in his work on the "Management of Bees," says, "I counted, as early as the 16th of May, 1732, one hundred and seventy five slaughtered drones under the new ventilating method."

Mr. Nutt, the author of "Humanity to Honey Bees," in a note to his last edition, says, "My friend the Rev. T. Clarke informs me that he has two fine stocks of bees that last year (1836) killed and cast out a great quantity of drones early in May; that both were afterwards prosperous; and that they again killed drones in August, just as if they had destroyed none before. The cause of this curious fact is a problem for the naturalist to solve."

I think I have given the true explanation.

should be a great number of drones, that the queen should be sure of finding one in her excursion through the expanse of the atmosphere, and no risk of sterility."

Conflicting opinions have been formed as to the desirableness of assisting the working bees in the task of expelling the drones; often a protracted and irritating process. If it can be done at once, without annoyance to the workers, I think much fighting and valuable time may be saved by it; but not otherwise. When attacked, the drones to avoid persecution, will congregate together in a remote part of the hive. Observation led me to think they would at such a time be glad to retreat for still greater safety into a separate box, so placed as to be accessible to them. Accordingly, on the 14th of June, in one of my collateral stock hives, where the drones for a day or two had been hard pushed by the others, I opened a communication on the ground floor into an empty side box. My theory was completely realized, for the poor drones gladly made their way into this, where they remained clustered at the top like a swarm, not a single bee accompanying them, and would probably have been starved. The following morning I took away the box of drones and destroyed them, counting rather more than 2,200, besides some few that had escaped. I did not find among them a solitary working bee; nor could I afterwards discover in the parent stock hive one remaining drone. The bees peaceably at once recommenced work, and did well; as if glad of this wholesome way to be rid of their late unprofitable inmates. What was the cost of their daily maintenance? And what proportion to the entire population did they bear? After this apparently large abstraction, no sensible difference was observable in the crowding of the hive.

HODDESTON AGRICULTURAL TRAINING SCHOOL.

The public distribution of prizes at this important Agricultural School, took place in the spacious lecture room attached to the institution, on Thursday last. Sir Charles Napier, M. P., presided on the occasion, and amongst the visitors we noticed G. J. Bosanquet Esq. Capt. O'Brien, Capt. Wormly, R. N.; Messrs. Robinson, Wilks, Stokes, Bridge, Clarke, De Porquet, &c.; Rev. R. W. Morice and — Blanc; there were also present Professors Cooper, Donaldson, Jackson, and Symonds, who are connected with the establishment.

Hitherto the education of agriculturists has been sadly neglected. The sons of opulent farmers have, indeed, in some cases, received what is termed "a liberal education," but the education which is understood to be meant by that descriptive appellation, is not of the kind which fits a man to become a cultivator of the soil, because it does not comprise the peculiar information, the practical training and the habits of mind, which are congenial to, and which tend to promote skill in agricultural pursuits. The education of a farmer, more than that of any other manufacturer, required to be based upon an intimate acquaintance with the laws of organic matter, with chemistry, and with a host of subsidiary facts relative to natural phenomena.

About half past one, the students assembled in the spacious lecture room attached to the School, which was well filled. Shortly after the company had assembled, Sir Charles Napier, M. P., entered, accompanied by Mr. Haselwood, (the head master), the professor, and several of the principal visitors. The entrance of the gallant commander was the signal for a burst of enthusiastic cheering. When this had subsided,

Mr. HASELWOOD (the head master), rose and read the report, and on proceeding to call over the prizes, remarked that a prize had been selected for each branch of study in the school, but it had been subsequently thought advisable that two medals, one of gold, and the other of silver, should be given to those who had exhibited the most proficiency in all the branches of study, collectively.

The gallant CHAIRMAN then proceeded to distribute the prizes, forty in number. We regret we have not space to record the names of all the successful candidates, but the first prize, for general proficiency, gold medal, was awarded to — Rayne (Surrey); and the second prize, for general proficiency, silver medal, to — Galway, senior (Ireland).

When the distribution of all the prizes had been concluded, Sir C. NAPIER rose and said—During the course of a pretty long life, he had been placed in a variety of situations, but, certainly, never in a position so peculiar as that in which he was now at present placed, to distribute prizes to the successful students in an agricultural school (*hear, hear*). He regarded agriculture as one of the most important pursuits, so far as the country was concerned, and as one of the most interesting to those who were engaged in it; and he believed that we had now arrived at the period when it was essential that all classes should turn their attention to the better cultivation of the soil. All persons were pretty well aware that what was termed “protection” was dying, and he believed that Monday would decide the fate of the corn laws. He agreed with Lord John Russell, “that protection was the bane of Agriculture,” and he was satisfied, that when the trade was thrown open, it would be found that there was energy and spirit sufficient in this country to enable us to rival all the nations of the earth. He felt certain that through the agency of schools like this, where scientific knowledge was added to practical experience, agriculture would yet flourish to an extent that we did not now even dream of (*cheers*). It might seem strange that he (Sir C. Napier)—an old sailor—should be a farmer; but he was a practical farmer, without any knowledge of science, but he believed that science added to practical knowledge would do wonders in farming. He (Sir C. Napier) some time back took a small farm which had never produced a crop. The farmers in his neighbourhood had gone on in the old way, employing two or three men and horses, and a few old ploughs—only *scraping* and not *ploughing* the land, and were surprised that with these inadequate means they could not get a crop (*hear*). Near his (Sir C. Napier's) farm, there was an old man—lame, blind, and deaf, (*laughter*); but of an independent character, which enabled him to overcome his infirmities, and he cultivated his land in a superior manner to his neighbours; and he had some conversation with this old man, relative to the state of the farms in the district. He asked him how it was that he, who had only a pony cart, got on so much better at farming than his neighbours. The old man replied, “If you follow my advice, which the farmers here won't follow, you will find your land get on well.” He followed the old man's advice, and by so doing had produced the best crops in that part of the country (*cheers*). He had now a young man to manage his farm, which on the improved system, was producing excellent crops. No other land in the neighbourhood had produced so much; and his wheat now was he believed among the finest in the country. When told that the farmers of this country could not compete with those of foreign countries, his answer had been “Plough deep; clear out your weeds, and your produce will be as fine and abundant as that of any

country in the world. But there was a disinclination among many farmers to improve; they went on in the old way, saying, “My father did well this way, and I shall do the same.” But they must go on improving, now, if they would compete with others; and if they did go on improving, he, for one, had no doubt that the result would be that in a few years, instead of being as now an importing country, we should be an exporting country, (*cheers*). When he went to Scotland he was struck by the results of good cultivation there, and he said to himself, “Why can't we, with our fine climate, equal these men?” Why they could not grow vetches in Scotland, and the effect was seen in their cattle; yet, although possessing such inferior resources, as compared with us, they had by means of improvements, produced large and good crops. We had hedges and ditches,—the former throwing weeds all over the crops, and the latter having frequently to be cleaned out at a considerable cost; but in Scotland it was not unusual to see twenty acres of arable land on a stretch, without hedges and ditches intervening (*cheers*). Turnips there were sown two feet apart, instead of being broadcast, and the result was frequently a crop of 20 tons to the acre. We however went on the old system of broad-casting, and if we got a turnip as big as our fist, were contented (*laughter and cheers*). One of the chief evils in farming, was men engaging in it without sufficient capital (*hear, hear*). Now he (Sir C. Napier) looked upon a farm as an agricultural mill, and he believed that if this were generally done, and the requisite capital and skill were invested in it, agriculture would be found to produce a good living for those who engaged in it. The agriculturist had the healthiest and the happiest trade in the country; his labours were almost all performed under the canopy of heaven, and not in close, unwholesome workshops. The nature of his pursuits were altogether calculated to promote his comfort and health. He was sure that all the young gentleman studying here would derive the utmost satisfaction and help from their studies, and when they went to the practical part of their pursuits, they would find no difficulty in making the earth produce its fruits. Like a child, the land would, if treated well, grow up in strength, and produce abundantly; but if not treated well, it would never prosper. Treat it as they would bring up a child, with care and attention, and it would assuredly produce them a most grateful return. (The gallant commodore concluded amidst loud applause, and on leaving the chair he was greeted with three hearty cheers).

Mr. HASELWOOD announced that the school would reopen on the 24th July, and the company then separated.

We were much gratified to find that the school-buildings had been improved and enlarged since our last visit to this excellent institution....*Abridged from the Hertford Mercury.*

THE DAIRY AT BLENHEIM.—One gets a tolerable idea of the almost extravagant opulence which is here displayed, when I say, that in a large vaulted hall for preserving milk, cream and butter, a splendid fountain has been erected, to throw up the clearest spring water, which falls down along several basins, growing gradually larger, until it comes to a large basin at the bottom, which is so arranged as to have upon its brink vessels and basins for containing the cream and butter, which thus in the warmest weather are kept at the degree of coolness so necessary to these useful kinds of food. In any other place this fountain would be used as the entrance of an avenue, while here it merely serve to cool a dairy!—*England in 1844, by Dr. Carns.*

HINTS TO TUTORS ON CLASSICAL TUITION.

By DR. THOMAS COX, Head Master of Queen Elizabeth's Grammar School, Barnet.

An exceedingly useful and valuable treatise, calculated to facilitate the acquisition of the Latin and Greek languages. No classical tutor should be without it: it will save him much labour, greatly advance his pupils, and, in consequence, satisfy and gratify their parents. It is astonishing that this method of tuition—which appears to us exceedingly simple—should not have been adopted before. It is a mere adaptation of things known to things unknown; so that whatever a child already knows, serves as a base on which any intellectual superstructure may be built:—

"It is necessary to understand the tools we are using as well as the mode of using them. Our tools are the minds and memories of children, and those tools are infinitely varied by previous circumstances. Nature has here much to do; but associatious more. No child is totally incapable of education, and no child naturally indisposed to it. The indisposition which we observe, in ninety-nine cases out of a hundred, arises from previous circumstances or arbitrary and child-displeasing systems. It is my wish to show how these arbitrary and unloveable systems may be moulded into freedom and liking, and how previous association may be made to induce children to learn, and to love learning. In a word, I wish to unswaddle and teach it to use its own feet; to make its own creeping lead to its own walking, and its own walking to afterwards running the mighty race of intellectual glory.

"Bacon, in his encyclopædical tree of knowledge, has pointed out the trunks, the fruits, and the flowers, of which mental cultivation is capable. Nothing is more true, more just, more beautiful, or more sublime than the view this immortal philosopher has taken. One great branch leads to another, and another, in an almost endless succession. So may one acquirement be made to lead to another, and that which is as yet unknown be more easily taught by connecting it with something that is already known and more familiar. In teaching, therefore, it is necessary to follow nature, rather than rules of art, in thoroughly, substantially, and permanently cultivating the youthful mind."

It has always been a source of regret to us, that practical farmers cannot be induced to put their opinions and sentiments to paper more frequently, and thereby supersede the crude notions of theorists, or half-practised individuals, with whose lucubrations the columns of our agricultural publications abound. Were the Committee of the House of Lords "on the burdens affecting real property," productive of no other benefit, it will have effected good by eliciting the opinions of some of our best farmers upon several questions of general interest to the agricultural body. Mr. Hudson of Castle Acre, Norfolk; Mr. Baker, of Writtle, Essex; and Mr. Wm. Bennet, of Lewsey, Beds; were all examined on the employment of labourers and the use of agricultural machinery.

Mr. Hudson is asked—

"If there was no such a thing as a poor-law in this country, should you employ as much labour and the same description of labour as you do now, supposing it were your principle to sell in the dearest market and buy in the cheapest?—We must endeavour to cultivate our land in that case *with as few hands as we could get on with.*"

In order to elicit the mode whereby he would cultivate the land "with as few hands as he could get on with," he is thus examined:—

"Would you employ machinery?—I do employ machinery.

"Could you employ it to a greater extent?—Yes. *The employment of a great part of our machinery I consider as the means of our employing more hands.* I know that twenty years ago, under the system we then had of feeding our sheep, my amount of labour was very much less in feeding the sheep than it is now. Two shepherds and two boys would move the hurdles during the winter in feeding the sheep, and pull the turnips. But of late years, and more especially since the establishment of the Royal Agricultural Society, we have introduced machinery, and that enables me to employ a great many more hands. I think I am now paying between £6 and £7 per week for the cutting of my turnips and the feeding of 100 sheep; whereas it would have cost me twenty years ago only 30s. a week.

"These are hand machines?—Yes.

"Suppose there were no poor-rates, and you were to sell in the dearest and buy in the cheapest market, and you were able to do as you pleased, would you think of using steam-engines?—*I have one.*

"Does that decrease the number of hands that you employ?—*I do not employ less in consequence.*

"What does this steam-engine do?—It thrashes my corn, and makes my oil cake.

"Do you mean to say that you still employ as many men with the steam-engine as you did with the flail?—I did not use flails but horse power machines. I have shortened my horse labour very materially by using the steam-engine.

"You have not diminished your amount of labour as regards your men?—I have not, because I have an oil-mill attached to my farm, which keeps them in work, and I employ the team to bring home coals. I have put the horse work to other purposes."

* * * * *

"Then, upon the whole, you are of opinion that, so far from machinery having reduced the number of labourers upon your farm, it has increased their number?—*Yes, altogether, decidedly.*"

On looking to Mr. Baker's examination, we find the following:—

"From your experience, can you state what particular burdens you imagine weigh solely upon the land?—I think the most particular burden we have to contend with in competing with the foreign producer is, that we have not the free use of machinery. Having the poor attached to the land, and being compelled to find them labour or find them maintenance, we are deprived of the use of machinery. Machinery might be substituted to a very great extent to put us on a footing with the foreign producer; but as we cannot avail ourselves of that, and are obliged to employ labour at a high rate, we cannot compete with the foreign producer.

"You consider that the operation of the poor-law is one of the chief burdens upon the farmer, inasmuch as it very much restricts you in the choice of labourers of the choice of machinery that you can employ. You have to employ more labourers, and, in addition, you are obliged to pay poor rates if you do not employ them?—Yes. I have an opinion that the amount or expenses of cultivation might be reduced fifty per cent. if we could avail ourselves of machinery and other facilities."

In Mr. Bennett's examination we find the subjoined questions and answers:

"In the present case, if you were under no obligat-

tion to take care of those (labourers) who were out of employment, you would not employ so many as you now do?—Certainly not. If we were to go strictly upon the system of buying in the cheapest and selling in the dearest market, and husbanding our resources, and if we are driven to it by further reduction of price of corn, there would be no alternative but establishing horse and steam thrashing-machines, and doing the work at the cheapest possible rate; and that would be resorted to if it were not hemmed in by the poor-rate.

"Can you form any idea what the difference of expense would be if you were able to carry on your business in that manner?—In conversation with my brother, who is a larger farmer than myself, he stated this: 'If the government would take the poor upon the consolidated fund, and let the farmers do their work as the manufacturers do, without reference to any burthens, in the cheapest possible way, I would have a steam-engine instantly upon my farm, and I could have no hesitation in saying it that would be generally so.'

All agree in the importance of machinery. Mr. Hudson says, "I use machinery, and that enables me to employ a great many more hands." Mr. Baker and Mr. Bennet feel themselves restricted from the use of machinery, because, in their opinion it would dispense with human labour. These statements appear at the first view contradictory; but we think they are reconcilable. It is a question of some importance against experience. Mr. Baker and Mr. Bennett not having tried it, think the use of machinery would supersede human labour. Mr. Hudson, now using machinery upon a very extensive occupation, finds that "*it enables him to employ a great many more hands.*" We hope Mr. Baker and Mr. Bennett will put the question to the test, and try Mr. Hudson's system.

The Canadian Agricultural Journal.

MONTREAL, SEPTEMBER 1, 1846.

ATLANTIC RAIL-ROAD.

We consider that the completion of this Rail-road would be of great advantage to the Agriculturists of Canada, as it would be likely to cheapen the means of communication between this country and the British Isles, both for exports and imports. In fact, if freights are not to be greatly lowered, we may give up all idea of exporting any of our agricultural products to advantage, if the prices of these products are to be as low as expected. If wheat is to be reduced in price in the British Market, to four or five shillings the bushel, and other grain in proportion, the price must be very low here. It will be the same with regard to other articles of export. It will therefore be our only chance of successful trade that the rate of transport should be as low as it reasonably can be. The navigation by St. Lawrence has long been a most injurious monopoly, and acted as a great drawback to the products of Canada, swallowing up

all the profits of the trade. A change is now absolutely necessary, or we shall have to lose the trade altogether. A Rail-road to Halifax might certainly be preferable, as more directly connecting this country with the British Isles, but we believe this would be impracticable, unless constructed by British funds, as the cost would be a very large amount, and altogether beyond our means. We should therefore use every exertion to construct the proposed line through the Townships, to meet the Portland road, and also the Boston road, if carried forward from that City to the neighbourhood of Missisquoi on the Province line. The more enlarged our means of transport for our produce, the better for us, and the more valuable will our produce become. The inhabitants of Montreal appear to think they have nothing more to do than build houses, and that the means of supporting them will flow into them as naturally as the air of heaven. They will discover their mistake when they find that the city is altogether dependent upon the country, and must prosper or decay as the country improves or retrogrades. When all other consideration fail to influence people to promote the improvement of Agriculture, the powerful motive of self interest may have the effect to stir them up. It is as impossible for Montreal to be improving and prosperous, unless the country generally is so, as it would be for a mill to go on working constantly after its chief supply of water, that worked the machinery, was cut off. It would require a large and prosperous trade to support Montreal in prosperity, in its present extent and expenditure. No doubt the country is able to yield this support, if her resources and capabilities are improved to the uttermost, and the freights of her exports and imports are reduced to a reasonable charge. There is not much danger in such a fine country as this, that is capable of yielding so large a production, that we shall extend our means of communication too much, or incur any risk by expending money in their construction. Rail-roads and canals will be great encouragement to improvement and production, because without them the difficulty and expense of transport would in many sections of this country, consume all, or nearly all, the value of produce. The proposed Rail-road to meet that to Portland, is a work we wish to prosper, and we have no doubt it will prove of great benefit to Montreal, and to the whole Province.

The inhabitants of the District of Quebec may

not be favorable to this line of Rail-road, but though it might not directly benefit them, this would not be reasonable cause that they should oppose the construction of the road. If a line of Rail-road could connect Quebec with the road to Portland, we think it would be very desirable and suppose this would be practicable. Should the Rail-road from Quebec to Halifax be constructed, —and we hope it will, Quebec will have no cause to complain. At all events it will be clearly for the interests of Western Canada, and the three Districts of Eastern Canada, Montreal, St. Francis, and Three Rivers, that the Rail-road to Portland should be constructed, and also a Road to meet the Boston Rail-road. If free trade is to be the order of the day, the United States may be induced to reduce their high tariff, and if they did, Boston might yet be found a good market for our Agricultural produce. Rail-roads are necessary appendages to the free-trade system, and to the movement party in all parts of the world. There is no other description of road suitable to those who wish to introduce changes in every thing, at Rail-road speed, and therefore if we have the changes, let us by all means have the Road also, or we cannot go on with the movement advantageously.

A NEW SPECIES OF WHEAT.

We have seen lately, growing in the garden of the Receiver General, the Hon. William Morris, a new and extraordinary species of wheat. The ear was very large, of a dark brown colour, flat in shape, having three rows of grains on each side, with strong and hard chaff, and very long awns or beard, and the ear containing from seventy to eighty grains of wheat, of the same colour as ordinary wheat, but rather longer. On dividing a grain the inside appears perfectly white but of course we cannot yet judge of its quality for making bread. The Hon. Mr. Morris in his letter, favoured us with the following history of this wheat, which he termed, "Wild-goose wheat" having been produced from grain found in the stomach of a wild goose shot by an Indian at the Narrows of Lake Simcoe, in October, 1843, and the gentleman who first found the wheat has been kind enough to hand samples to several individuals. Judging from the season of the year when the bird was shot, there can be no doubt but it was flying to the south, and that consequently the wheat upon which it had fed was picked up far north of the settlements of Lake

Simcoe." From the history of the wheat, we are convinced it is a different species from any known in the old world and may be indigenous to the North American Continent. From the great perfection and healthy appearance of the wheat when growing in the Hon. Mr. Morris's garden, in Montreal, we are satisfied it can be propagated with great success, and we are almost certain it will be proof against the ravages of the fly, and will not be liable to rust. If the grain should prove suitable for flour and bread, it will be a most fortunate circumstance for this country that such a species of the wheat plant has been discovered. Mr. Morris has been so good as to send us a few ears, and we shall take particular care to give it a fair chance next year of producing largely. This accidental discovery may be of much more consequence to us than we can at present imagine, as careful cultivation may improve, its quantity if improvement is necessary. A natural production if capable of improvement may be brought to much greater perfection than a foreign plant, because the climate and soil is sure to be suitable for it, having produced it naturally. This wheat was sown by Mr. Morris on the 13th September last, so that it must be a fall wheat, and so much the better, as it is proof against rust, to which the ordinary fall wheat is so very liable. We wish it was in our power to state the opinion of a botanist respecting this plant, but we hope to be able to do so in our next.

In this number, we give the report of an English Horticulturist of his hybridized wheat. The wild goose wheat, may perhaps be crossed in the same way with some other wheat, and both wheats improved. The reported success of this mode of changing varieties of wheat is a great advantage but we are not sufficiently acquainted with horticulture to be able to describe the exact process or mode adopted.

At the sale of short-horned cattle belonging to Mr. Thomas Crofton, of Holy-well, near Durham, England, on the 13th July last, five of the cows sold at from 76 to 135 guineas each; four heifers under two years old sold for 50 to 66 guineas each; a young bull 15 months old for 100 guineas, and one 13 months old for 78 guineas. These prices would pay for the expense of breeding, however great that expense might be. In Canada there is not much encouragement for raising high-bred stock.

At the last great annual meeting of the Royal English Agricultural Society, held at Newcastle in July last, Professor Johnston delivered a lecture on manure, and Mr. Parkes on draining, which we shall endeavour to copy in future numbers. The meeting was well attended; and at the great dinner several noblemen and gentlemen and gentlemen delivered interesting speeches on the subject of agricultural improvement, and the best means to promote the prosperity of the country generally.

AGRICULTURAL REPORT FOR AUGUST.

The month of August has been as favorable for harvesting, as farmers could desire, there being scarcely any rain throughout the month, and the temperature very high. The latter circumstance was the only disagreeable feature, as it made it difficult for the men to work in such great heat. It was fortunate for farmers that the weather was dry, or much of the crops would have been injured and lost, in consequence of the difficulty of procuring men to save them. As it is, there,—has been hay wasted and injured in colour from too long exposure to heavy dews, and hot sun, and much of the meadows not well raked. There has been a considerable quantity of early sown wheat cut and secured, and the late sown is also coming fast to maturity, and much already cut. The late sown appears very good, generally not injured by fly or rust. The early sown has suffered from the fly, but to what extent we cannot exactly state. We hope, however, should the season continue fine for two or three weeks, that the wheat will all be secured, and most of it turn out an abundant crop. We have some complaints that the excessive warm weather has ripened the grain prematurely, and that the sample will not be so good in consequence. We fear that this is the case, but we hope not to any great extent of injury. Oats we have no doubt will suffer greatly from this cause, as it requires more moisture than wheat or barley. It is also remarkable circumstance that late sown oats is almost totally destroyed by rust, particularly where the crop was luxuriant. In the latter end of July, there was considerable rain, and the oat crop came rapidly forward in rich land. The great heat of August succeeding, we believe produced the rust. There is not any crop of grain that will succeed better by early sowing than oats, and we would recommend that it should always be sown when

the land is fit to harrow in spring. It is remarkable that the weather in England this year partakes very much of the character of the season, in this country, and that the same difficulty is experienced with regard to labourers for the harvest. The public works in this neighbourhood commencing at the moment the harvest began, accounts for the scarcity of labourers, near Montreal. The Montreal Agricultural Society have imported two Reaping Machines from the United States, that are reported to succeed well, when the crop is all standing, and the management of the machine properly conducted. It will not of course be any use when the crops are lodged, and not standing fairly upright, which is difficult to find this year on rich lands, as they were considerably beaten down, and twisted about by the rain, in the latter end of July. A labour-saving machine, if not perfect in construction, simple, and easy to manage, so as to execute its work well, and without waste, will be found a money-losing machine by the farmer, and we confess, from the general imperfection of these kind of implements, we have seldom seen one that did not waste more than was saved in labour by its use. We do not, however, pretend to say that the Reaping Machine cannot be used to advantage, in standing grain, where the land is level, and the management understood, but without the latter being carefully attended to it must waste the grain. Improvement and use may greatly lessen the defects, and make it a more valuable implement to the farmer. The potatoes in many places have the vines or stalks decayed, and there is no doubt that the disease has already destroyed some of the fibres. Whether it will go on increasing as it did last year is impossible to say, but we fear it will, as the symptoms of disease have appeared much sooner this year than last. The quantity of potatoes planted is much less this year than usual. Some persons have removed the stalks already, in the hope of checking the progress of the disease. The great difficulty in finding a remedy for such a disease, is that we do not understand the cause which has produced it, or why it should effect the crop now, any more than at any former period. The only way we can pretend to account for it is, that we have changed the nature of the potato by our cultivation of it, and rendered it more soft and liable to disease, by overstimulating it with manure. The disease is coming on for the last twelve or fifteen years, first attacking the seed, and then the crop.

We see by the last mail, that the disease has appeared throughout the British Isles in the new crop of potatoes, so there is no chance of its being only a temporary affair. The hay crop has been so abundant this year that it offers every encouragement to farmers to feed cattle at least to the extent of a full supply for our own markets. Unless a part of the crops are applied to this purpose, the prices in market will be low indeed. If a part of our extra crop of hay, and inferior grain is converted into beef and mutton it may pay the farmer. At all events, it will pay better than selling their raw produce, and incurring the cost of taking to market. The pastures have suffered by the late dry weather, and dairy produce has advanced in price. Butchers' meat has maintained a fair price for the last twelve months. There is something manifestly wrong in our system of husbandry, because the price of meat and dairy produce is much higher in proportion than the food upon which neat cattle and sheep are fed, and this ought not to be so under a well regulated system of farming, particularly when our cattle and sheep have not been diminished by disease. The sooner this disproportion is remedied the better.

The Apple crop is very deficient this year, principally caused by ravages of the caterpillars in spring. There is, however, a large quantity of foreign apples in the market. In conclusion, should the season continue as favorable as it promises to the middle of September there will be ample time to harvest all the crops, as the wheat is generally ready now. The season, on the whole, has been one of the most favorable we have ever seen, and we will now have to look out how we shall be able to dispose of our crops to the most advantage.

Côte St. Paul, August 29, 1846.

HYBRIDIZED WHEAT.

The Hon. R. H. Clive, M. P., laid before the Council a communication with which he had been favoured by Dr. Lindley, in reference to a decisive result obtained by Mr. Maund, of Brooms Grove, Worcestershire (the well-known editor of a periodical work entitled the *Botanic Garden*), by crossing Egyptian corn with an English red wheat, and thus producing a beardless wheat: for "although," as Dr. Lindley observes, "there is not at present any proof of what the quality of this cross may be, yet it shows that corn is as open to improvement as any other plant; and that I take to be a highly important fact. All such attempts deserve encouragement; and if the Royal Agricultural Society were to take up this matter in good earnest, and to offer such prizes as will induce intelligent men with the necessary leisure and oppor-

tunity to give it their serious attention, important results might be obtained."

Mr. Clive then introduced Mr. Maund to the President and Council, when that gentleman exhibited the various specimens of wheat connected with his experiments, and detailed the progress of his operations in effecting the cross in question, between different kinds of wheat, for the purpose of producing the artificial fertilization required. Those specimens exhibited the varieties between the Oxford red and the Donna Maria white wheat; as well as those between the Egyptian corn and the Oxford red. In the produce of the latter cross some of the ears had awns, while others were without them. Mr. Maund stated that the new varieties thus obtained in his experiments appeared to possess great luxuriance and promise of fertility. He thought it not unlikely that eventually not only any given external character intermediate between those of the wheats selected for the occasion may be obtained, but that the chemical nature of the grain may be favourably influenced for any given pure purpose required.

The President, on the part of the Council, having then expressed to Mr. Maund the thanks which the Council, on the motion of the Duke of Richmond, seconded by Sir Robert Price, had voted to him for his attention in submitting to them his interesting and valuable results, requested that he would prepare for the Journal Committee, in the course of the autumn, a detailed statement of his experiments and their results, including not only a reference to the scientific circumstances of the fact as connected with the laws of vegetable physiology, or the changes produced in the chemical constitution of the plant, but also to the more homely, but not less important result of the practical value of his products as obtained by the miller and the baker.

WATER-ELEVATOR.

Dr. Spurgin, of Guilford-street, Russell-square, presented to the Council a working model of a machine invented for the purpose of raising water out of shallow cavities in land, and applying it in a continuous stream for any required object. Dr. Spurgin, in submitting this invention to the notice of the members, remarks:—"I have long thought it to be very desirable to have a cheap, simple, and efficient machine for raising water *only a few feet*, for the purposes of irrigation: it is to be expected that in those countries where irrigation has been practised from time immemorial, such contrivances would be resorted to as are most suitable; and, accordingly, we find the circular woollen belt among the number. A few weeks back I heard of the plan which the model I have submitted to you is intended to represent, and which is in use in some private gardens at the Cape of Good Hope. I had this model constructed accordingly for the use of the Polytechnic Institution; and, in order to make the plan more generally known, I thought, by submitting it to the inspection of the members of the Royal Agricultural Society, its value for farming and other purposes might be soon ascertained. One of the objections to the revolving belt has been the necessity for its being made to travel around a wheel or cylinder at the bottom as well as at the top; whereas, it is now proved that the lower wheel can be dispensed with altogether. The velocity also requisite to impart sufficient momentum to the water for carrying it over the wheel, and shooting it off from thence into a trough or pipe, is by this plan greatly reduced, whilst the momentum is unnecessary, for the little wheel which rolls and presses upon the ascending side of the belt

checks the upward progress of the water, and causes it to fly off into the trough at the required height; and further, the necessary velocity may be obtained either by a multiplying wheels, or by having the belt traversing on a single wheel of a large diameter, say from 5 to 7 feet or more, whilst the width and length of the belt may vary according to circumstances. For my own part I am certain that large quantities of water may be raised from ponds, streams, or reservoirs, for divers agricultural processes, at a very small cost; and that the produce of our meadow-lands may be increased by the employment of this simple but effective apparatus." Dr. Spurgin's machine consists of a woollen belt, dipping below into the liquid, and compressed or wrung out above by means of a small wheel pressing it closely to the rim of the greater wheel on which it revolves: while the water so intercepted and pressed out is received by an open conduit, and flows along in a continued stream.

THE BLIGHT AMONGST FRUIT TREES, VEGETABLES, &c.—(Our Retford correspondent, in a letter of yesterday's date, observes as follows:—"In a communication inserted in your paper, bearing date the 13th of May, I stated that the wind was then located in the north, and north-east, and which, if continued in that quarter, would bring or produce a blight, in the shape of aphides or lice, but little did I then imagine that it would be so severe and extensive as it has proved to be within the last few days; and as it is still progressing at an immense rate, we cannot say what the result may ultimately be. The edges are in many places covered with insects, whilst fruit-trees, plants and vegetables teem with life, and are being devoured by the innumerable swarms of insects, which completely cover and encrust them. The gooseberry bushes, as well as those of the currant, are nearly losing thier foliage, whilst the rose-trees, the sycamore, and several other descriptions of trees and plants, are exuding their sap from every pore. It has not been our lot to witness such a destruction of vegetable life in so short a time for many years; indeed we do not recollect any parallel to the present disastrous state of our fields and gardens in this locality; and it may now safely be predicted that the crop of fruit, thin as it was known to be a fortnight back, is now in many places nearly, if not altogether, annihilated. Within the last few days also, the increase in the fly, as well as in its concomitant filth upon the hop plant, has been gradually increasing, whilst in almost every plantation the honey dew, (as it is usually called,) is spreading its baleful influence in every direction. Every account which reaches us speaks of its universality, although most of these concur that, during the last few days, the vine has grown immensely, and still looks vigorous, but that ultimately it is feared the stamina of the plant must give way to the fearful infliction under which it is universally labouring. Any change in the weather would be beneficial, but electricity combined with rain if it would but come soon, might yet partially avert the calamity which so fearfully threatens the crop, and it is not unlikely but that the present hot and dry weather will terminate in that desirable manner.—*Douglas's Gazette.*

AN AUSTRALIAN SHEEP STATION.—I shall now proceed to offer a few observations upon sheep, and sheep stations. A sheep station is, probably, the most desolate place at which a man could be sent to pass his time. Fancy three men in charge of one thousand sheep, which range over five square miles of country, of which five miles those three outcasts are literally the only inhabitants, and, strange as it may seem, scing

but little of each other. One is the watchman who remains by the hut all day, shifts the folds, and sleeps between them at night, to protect their occupants from the prowling native dog; the other two are shepherds, who start every morning at daylight, in different directions, each in charge of his flock; they do not return to the hut until sun down, when they are tired and weary, and eager for supper and bed. Thus day after day, and month after month, pass in solitary wretchedness, relieved only on a Saturday for a couple of hours, when a man with the week's rations arrive at the station. These men live all the year round on salt beef and bread, the latter baked by themselves. They have no change either of diet, of employment, or of any think else; for, be it known, a really good sheep station in Australia yields nothing but grass and gum-trees, the soil being dry and poor. A shepherd on the hills of Scotland, who returns every night to his bothie, and finds a warm supper cooked for him by some kind female hand, is a prince compared with the exile of Australia, who comes home tired and sleepy at sun-down and may then either chop wood to cook his meal, or go supperless to bed, as suits his fancy.—*Trade and travels in the Far East.*

The following are interesting extracts from letters received by Keeling and Hunt, dated Cork, 8th July, 1845:—"Our native potatoes have already shown the disease in many localities, and, singular to state, none of the foreign has succeeded. Yesterday I was shown a garden where all were diseased excepting the 'Azores,' which shows a strong contrast from their extraordinary luxuriance." Another party writes to the same firm:—"I have much pleasure in letting you know that the Azores potatoes I got from you, are coming on as luxuriantly as our most sanguine expectations can desire, and I look forward confidently to an abundant crop, and sincerely hope that if those planted this year succeed, you will be encouraged to import into this country a new and useful kind of potato to replace those kinds which, I am sorry to say degenerated some years back."

AMERICAN AGRICULTURE.—Agricultural pursuits are, nevertheless, the most unsuited to the taste and general habits of an American citizen, particularly of the Northern and Eastern States: it is an employment of all others the most opposed to his notions of respectability and ideas of worldly comfort, and, in his interpretation, a mere waste of his time, an utter abasement of his mental and physical capabilities. In an extreme climate, such as the United States, it is considered the most ungrateful of all occupations; one wherein the strength and faculties of man are exhausted, the mind restricted in its native energy and freedom, without yielding any fair or adequate remuneration in return: as such, it is avoided by the youth as well as the aged of every class, whose better fortunes may enable them to escape from its severe restrictions; who seek the towns, the throng and tumult of crowded cities, the desk and counter of the merchant, or indeed any other business occupation, rather than the quiet, peaceful, and industrious pursuits, with its assumed or countervailing disadvantages, of an American country life. The fact is simply this, that agriculture, with any attendant good it may possess—its unrestricted freedom and comparative exemption from worldly care, together with its steady remunerating profits—is too tedious in its movements, too slow in its operation, and far too circumscribed in its range, to accord with the speculative turn of the American citizen, or keep pace with its unceasing and active industry.—*Wyse's "America."*

AGE OF PLANTS.—Some plants, such as the minute funguses termed mould, only live a few hours, or, at most only a few days. Mosses, for the most part, live only one season, as do the garden plants called annuals, which die of old age as soon as they ripen their seeds. Some, again as the fox-glove and the hollyhock, live for two years, occasionally prolonged to three if their flowering be prevented. Trees, again, planted in a suitable soil and situation live for centuries. Thus, the olive may live 300 years, the oak double that number; the chestnut is said to have lasted 950 years; the dragon's blood tree of Teneriffe may be 2000 years old, and Adamson mentions banians 6000 years old. When the wood of the interior ceases to afford room by the closeness of its texture, for the passage of sap, or pulp, or the formation of new vessels, it dies, and by all its moisture passing of into the younger wood the fibres shrink and are ultimately reduced to dust. The centre of the tree thus becomes dead, while the outer portion continues to live, and in this way trees may exist for many years before they perish. The singular elephant plant has been said to attain, at the Cape of Good Hope, the age of 200 years, reckoning by the rings of the bark of the crown. De Candolle gives the following table of very old trees.

Elm.....	of 335 years.
Cypress.....	about 350
Cheirostemon.....	about 400
Ivy.....	450
Larch.....	576
Orange.....	630
Olive.....	700
Oriental plane.....	720 and upwards.
Cedar of Lebanon, almost	800
Oak.....	870, 1080, 1500.
Lime.....	1076, 1147.
Yew.....	1214, 1458, 2588, 2880
Taxod'um.....	about 4000. to 6000.
Baobab.....	5150 (in the year 1775)

AGRICULTURAL COLLEGE, CIRENCESTER.—His Royal Highness the Duke of Cambridge, attended by Baron Knesebeck, left town on Tuesday last, for the purpose of inspecting the Royal Agricultural College at Cirencester. He was received at the seat of Earl Bathurst by a party consisting of Lord and Lady Wharnclyff, Lord De Mauley, the Earl and Countess St. Germaus Lady Georgina Bathurst, Lord Melton, the Hon W. Bathurst, &c. Shortly after his arrival, he visited the College, accompanied by his noble host and party, when he was received at the entrance hall by the officers of the institution, and was conducted through the ample dining hall and kitchen, the laboratory, council rooms, and dormitories, with which, as well as with the commanding site and architecture of the building, he expressed himself highly gratified. His Royal highness was one of the earliest promoters of this truly rational undertaking. On leaving the college, he was greeted with three cheers by the students.

SUMMARY OF THE WEATHER AND THE DISEASES FOR THE MONTH OF JUNE, 1846. FROM DR. BAILEY, OF THETFORD. OF GREAT INTEREST TO AGRICULTURISTS, &c.—Since the year 1826 we have not experienced such a continued high temperature in this month. From the 2nd to the 22nd the temperature was considerably higher than summer heat; reaching on Saturday, the 6th, in the shade to 89°, and in the sun to 111°. The heat was felt most oppressive from the cloudless sky, and there being no wind. The barometer was high at the commencement of the month; after the third day it daily fell to the eighth, when we had some thunder and lightning but no rain. On the 10th some heat-drops fell, but only for a few minutes; after which the glass rose again, and continued high to the 21st, reaching its highest points on the 16th

and 17th days: the weather during this period was very hot and remarkably fine and dry. Vegetation drooped from the excessive heat, and the grasses were burnt. The artificial grasses were never known got up in better order. In this locality of light soil the barleys, oats, and peas have suffered exceedingly, almost past recovery. From the 22nd day an extraordinary change of temperature took place; a fall of nearly 20°, accompanied by the long wished for and invigorating showers of rain, amounting in four successive days to a little more than half an inch. The barometer fell from the 27th to the 25th, and rose again to the end of the month: such a sudden change had a great effect upon the human constitution, and produced those diseases as stated below. The difference of temperature has been remarkable; the highest, in the sun, was 111°, and the lowest on the grass plot, in the night, 40°, making a difference of 71°; while the highest in the shade was 89°, and that at midnight in the same place was 45°. The mean of the heat in the sun for the month was 90½°, and the mean on the grass plot was 47½°. The mean of midnight temperature in the shade was 55½°.

Diseases.—The very great heat experienced this month has occasioned more diseases than generally; diarrhœa has been particularly prevalent, attacking all ages, and producing much debility. Inflammatory attacks of the stomach and bowels, arising from drinking large quantities of cold liquids while in a state of profuse perspiration and fatigue, have been more general among the working classes than I ever remembered; in one or two cases nearly proving fatal, these requiring the most active means of treatment. Violent verigo has in several cases come under observation, I have no doubt arising from the excessive heat and exposure to the sun; and also great pains in the feet, and swellings of the legs of an anasarous kind in the working men. Fevers of the common kind have also been prevalent, terminating with a most distressing cough, putting on pneumonic form. From imprudent exposure sore throats have been frequent, and rheumatic affections, such as lumbago, &c. Some few cases of influenza still remain with us. The diseases amongst children have been numerous, attacking the chest, with considerable fever and diarrhœa, &c. The latter complaints have come on more particularly within the last ten days, caused probably by the sudden low temperature; some deaths have occurred with them.

POPULATION, TAXATION, &c.—It appears from returns just issued by order of the House of Commons that in 1801 the population of Great Britain was 10,942,646; in 1845, being 19,572,574. In 1796, the national debt amounted to 301,861,306*l.*; and in 1815, 816,311,940*l.*, at which time it was at its highest. It is now 768,789,241*l.*; the interest on the debt, funded and unfunded, being 27,827,265*l.* In 1796 it was 11,841,208*l.*, and at its highest in 1816, when it amounted to 32,938,751*l.* The poor-rates in England were, in 1803, 5,348,205*l.*; in 1818, at their highest, being 9,320,000*l.*; while, in 1844, they amounted to 6,848,716*l.* In 1838 they were only 5,186,389*l.* The number of paupers in England was, in 1813, 1,426,065; in 1843 they were 1,539,490 in number (some 110,000 more than 1842.) In 1796 the official value of exports from Great Britain to all parts, except Ireland, was 25,130,624*l.*; in 1845, it was 150,645,019*l.* The official value of imports into Great Britain from all parts except Ireland, was, in 1796, 29,422,446*l.*; in 1845, it was 83,330,609*l.*

A "DIGNITARY'S" IDEAL OF A WORKING MAN'S DINNER.—Wholesome food (he says) according to my definition, ought to consist of a diet of which bread, made of the ground seeds of the more generous cerealia, ought to constitute a large element; and this bread might, to a great extent, be partially displaced by preparations of the seeds of leguminous plants. But along with this farinaceous food, there ought to be consumed a fair proportion of animal substances, whether in the form of milk, butter, cheese, flesh, fowl, or fish. I have no hesitation in adding, that there should also, in the case of hard-work men, be a due allowance of fermented liquor, the soul of the seeds of the cerealia, or of fruit-trees, in the shape of cider, wine, beer, porter, ale. This will be recognized all over Europe as the Englishman's bill of fare. Such was the food of the patriarchs—the kid, the calf, the lamb taken from the fold, milk in its various forms, and especially bread, without which Jacob and his children could not live comfortably, with all their numerous flocks and herds. Such was the food which Melchisedec brought forth to refresh the wearied servants of Abraham. He refreshed them with bread and wine, God's best earthly gifts to his creatures. The priests of the old world, under every dispensation, approached the altars of their gods with similar offerings. Old Homer allowed no other food to his warriors before Troy but the generous diet of bread, what we call butchers' meat, and wine. And the riotous suitors in the Odyssey revel in the same substantial course. The harvest food of even his reapers was the roasted ox, and newly baked scones; and his very ploughmen received, at regular intervals, a refreshing draught of wine. Herodotus states as an historical fact, that the warriors of Egypt received, among other perquisites, a daily allowance of bread, butchers' meat, and wine: even her very bondsmen, when taxed hardest to their work, were allowed to revel in the luxuries of the flesh-pots.—*From a Letter to the Archbishop of Canterbury, by a Dignitary of the English Church.*

NUTRIMENT IN SUGAR.—The nutritive properties of sugar are much underrated in this country. As an aliment, Dr. Rush, of Philadelphia, maintains that sugar affords the greatest quantity of nourishment, in a given quantity of matter, of any subject in nature. Horses and cattle were fed wholly on it at St. Domingo for some months, when the exportation of sugar and importation of grain were prevented from want of ships. During the crop time in the West Indies all appear fat and flourishing. The cattle fed on the cane-tops become sleek, and in a fine condition. The negroes drink freely of the juice, and become fat and healthy. Sir George Staunton observes, that many of the slaves and idle persons in China hide themselves among the canes, and live entirely on them for a time. In that kingdom the emperor compels his body-guard to eat a certain quantity of sugar every day, that they may become fat, and look portly. Sugar and rice constitute the common food of the people, and every kind of domestic animal is fed on sugar. Plagues, malignant fevers, and disorders in the breast, are unknown in the countries where sugar is abundantly eaten as food. The celebrated Dr. Franklin used to drink syrup every night before he went to bed, to alleviate the agonies of the stone. In short, Dutrone, with all the vivacity of a Frenchman, burst into a rhapsody on the excellence of sugar. He not only panegyrises it as the triumpher over seasons and climates, in enabling us to assemble at our tables the fruits of every season and country; as the softener of asperities; the *delice* of confectionary; the seductive

charm of liquours; but he would exalt it as the panacea of life, the invigorator of infancy, the restorer of sickness, the renovator of old age. He invites the brewer, the baker, the vintner, to prove its beneficial influence in their several arts. He calls upon the apothecary to acknowledge its aid in compounding medicine; and he recommends the surgeon to lay aside his unctuous plasters, and to apply saccharine lenitives.—*Popular Errors Explained.*

THE MOON IN LORD ROSSE'S TELESCOPE.—With the moon, every object on its surface, of the height of one hundred feet, was now distinctly to be seen, and he had no doubt that under very favourable circumstances it would be so with objects sixty feet in height. On its surface were craters of extinct volcanoes, rocks, and masses of stones almost innumerable. He had no doubt whatever that if such a building as he was then in were upon the surface of the moon, it would be rendered distinctly visible by these instruments. But there were no signs of habitations such as ours—no vestiges of architectural remains to show that the moon is or ever was inhabited by a race of mortals similar to ourselves. It presented no appearances which would lead to the supposition that it contained any thing like the green fields and lovely verdure of this beautiful world of ours. There was no water visible—not a sea, or a river, or even the measure of a reservoir for supplying town or factory; all seemed desolate. Hence would arise the reflection in the mind of the Christian philosopher—Why had this devastation been? It might be further inquired—Was it a lost world? Had it suffered for its transgression? Analogy might suggest the question—Had it met the fate which Scripture told us was reserved for our world? It was obvious that all this was mysterious conjecture.—*Dr. Scoresby's Letter on Astronomy.*

We are glad to find, from the following portion of a gratifying letter from Mr. J. D. Gilbert, dated July 29th, 1845, that the schools are still progressing so well.

"I have to day seen Harris, the Master of one of the self-supporting agricultural schools, established by the late Mrs. David, in the parish of East Dean. He informs me that he occupies 5 acres of land, for which, with a house) he pays £8 15s. a year rent. His school has been opened 3½ years; he has, at present 16 scholars who each pay him 1d. a week, and work for him on his land from 2 to 5 o'clock every afternoon, in return for the instruction he gives them in the morning between the hours of 9 and 12. The ages of his scholars vary from 4½ to 12 years, and the numbers who have attended his school, daily have averaged about 17 and 18. Harris has paid his rent regularly and has repaid £2 15s. out of a sum lent him to purchase a cow. He is perfectly satisfied with his situation, and the school, is, I believe, well conducted and flourishing. James Sherwood's school, at Pevensey, has been established 2 years. He occupies a house and 3½ acres of land at a rent of £9 18s. He has, at present only five scholars, this being the season of the year at which children are employed in weeding for the farmers. He keeps his school on the same principle as Harris, and is perfectly satisfied with his situation. He has never had so small a school as at the present time; generally 20, and at one time 37, children attended his school daily."

It behoves us always to bear in mind, that while actions are always to be judged by the immutable standard of right and wrong, the judgments which we pass upon men must be qualified by considerations of age, country, situation, and other accidental circumstances, and it will then be found that he who is most charitable in his judgment is generally the least unjust.—*Southey.*

THE DEADLY FOE OF THE SNAKE.—Attack and defence call forth, perhaps, some of the most beautiful combinations of effect and passion which can be conceived, as, for instance in the secretary bird and the snake. In an instant the former circumvents its intended prey; its escape is hopeless; it instinctively feels itself in the presence of its deadly enemy, and for the preservation of life prepares itself for the fearful encounter. Half erect, with gleaming eye and its body coiled or straightened to meet the exigency of the moment, it faces its ever active foe; it writhes and sweeps the ground with the convulsive movements of his tail, and, like the skilful fencer, acts on the defensive till the opening for the fatal lunge presents itself, but the wary bird allows no such advantage; for dropping its wing shield-like before it, it repels every attack by prostrating the serpent by the powerful action of its pinion, and leaping rapidly behind it secures the victory and its prey by a well-directed blow on the skull. This is a beautiful picture; the issue of life is in the struggle, of which nature is the prompter, and in which the energies and passions of both are worked up to the highest pitch. Dreaded by every other living creature, the snake here encounters its mortal enemy, ordained by the hand of providence to keep its race within due limits.—*E. P. Thompson's Note Book of a Naturalist.*

A CURIOUS CONTRIVANCE.—On Thursday morning the lives of several of the letter carriers employed in the General Post-Office in St. Martin's-le-Grand were placed in great jeopardy by the sudden disarrangement of part of the new machinery recently erected in the establishment, used for the purpose of hoisting up the newspapers and men, and lowering them from the newly-finished rooms over the inland and letter-carriers' offices. The machine—which is worked by means of a powerful engine placed on the centre of the basement—is fitted at each end of the letter carriers' office north and south. It consists of a series of flaps, about six feet apart, chiefly of wood on a framework of iron, which are so constructed as to pass with facility underneath and over the top of the framework, thus rendering any reverse motion unnecessary. As the flaps reached the level of the ground-floor, baskets filled with newspapers, and men with trays filled with letters are placed upon the flaps, which, while the machine strapping is in gear, is constantly moving round at a moderate pace. Great care is required by the men in placing on the baskets, and in stepping on and off the several platforms even when the machine is regularly worked, but when any accident occurs by which the smallest particle of the minute wheels in connection with the motive power become disarranged, the shelves are whirled round with fearful velocity, and the men placed in eminent peril from the fact that if they do not jump off or are dragged out, or the engine momentarily stopped, nothing can save them from being crushed to death. Just before the despatch of the letter carriers on Thursday morning at half past eight o'clock, several of the men were travelling from the upper rooms (where 14 divisions of them assort, and prepare their letters for delivery) to the floor by the machine, a sudden disarrangement of the apparatus took place, and the shelves are lowered with frightful force. Some of the men succeeded in jumping off, others were dragged out as they reached the floor by their brother officers: one letter carrier fell with considerable violence upon his head, and one of them named William Pretty, had the greatest difficulty in escaping from being crushed by the flap above him. Happily none of the men are injured except slightly.

Their terror at the machine, however, caused them to dread that part of the official duty. In consideration for the safety of the officers thus employed, a notice was yesterday afternoon posted in the office prohibiting any one of them from going up or down the machine, except when the baskets or bags of a heavy kind are conveyed by it during the greatest pressure of the duty.

THE OFFICE OF FORST-MEISTER.—The duties of the office of forst-meister are not of a very onerous nature. He has the absolute command of all the game on the principality where he resides; no one can shoot a single head without his permission; and if he keeps a good day's shooting for his royal master, when he pays his annual visit, no questions are ever asked as to what he does with the remainder. And when any one considers that in Germany a good deer fetches nearly the same price as a bullock; that partridges sell at a florin a brace; black game, similar to the black cock of Scotland, at three; and pheasants and capercazies for about as much more; the profits he derives from the sale of game, added to his official salary; which is about 5,000 guildens per annum, must make the forst-meister's berth a very profitable one indeed. He has finer and more varied shooting, besides, than the best preserves England or Scotland can boast of; he is supplied with the choicest wines by the neighbouring vine-growers, who have an interest in preventing their vineyards from being beat by his chasseurs until the grapes are pulled; his residence is always in some ancient castle, which is perched upon a romantic eminence overlooking a wide extent of magnificent forest scenery, and the only troublesome duty which appertains to his office is the looking after the woods and taking care that too much is not cut. All the forests, not only those which belong to the grand duke, but those also which are the property of his subjects, are placed under the surveillance of the forst-meister, and he has the power of preventing even the owners themselves from cutting more wood than he thinks expedient. It is the main article of firing, and the policy of the German states being to keep themselves as independent of each other as possible in regard of the necessaries of life, the proprietors of the forests are, therefore, not permitted to make away with even their own property to an extent which might militate against the common weal; and such extraordinary vigilance is exercised by the wood-police, that scarcely a stick can be cut without their knowledge.—*Dublin University Magazine.*

ON ENVY.—The envious man is in pain upon all occasions which ought to give him pleasure. The relish of his life is inverted and the objects which administer the highest satisfaction to those who are exempt from this passion, give the quickest pangs to persons subject to it. All the perfections of their fellow creatures are odious. Youth, beauty, valour, and wisdom, are provocations of their displeasure. What a wretched and apostate state is this; to be offended with excellence, and to hate a man because we approve him! The condition of the envious man is the most emphatically miserable; he is not only incapable of rejoicing in another man's merit or success, but lives in a world wherein all mankind are in a plot against his quiet, by studying their own happiness or advantage.

From a Parliamentary return it appears that the commission to inquire into the potato disease costs 19,000l.

JONES PATENT FLOUR.—We agree with Doctor Herapath in considering that Jones' patent flour is one of the most valuable inventions of the age; that is, if we are to estimate its worth by the influence that it is likely to exercise on the health and daily comfort of immense masses of persons. Provided with the patent flour and water, and the means of making a fire, new and beautiful bread may, within two hours, be in the hands of the sailor on the ocean, or of the traveller on the mountain or in the wilderness. The general introduction of Jones's patent flour into use must lead to a complete revolution in the present system of baking bread and biscuits. We repeat, that, judging of the utility of Mr. Jones' invention by the numbers whom it is calculated to gratify and benefit, its value could hardly be estimated.

THE REVENUES OF THE MIND.—The ear and the eye are the mind's receivers; but the tongue is only busy in expending the treasure received. If, therefore, the revenues of the mind be uttered as fast or faster than they are received, it cannot be but it must needs be bare, and can never lay up for purchase. But if the receivers take in still with no utterance, the mind may soon grow a burden to itself, and unprofitable to others. I will not lay up too much and utter nothing, lest I be covetous; nor spend much and store up little, lest I be prodigal and poor.—*Bishop Hall.*

HIRING SERVANTS.—In hiring servants, all will desire to have those who have spent most of their years of service, and especially their earliest, in families whose principles, habits, and general bearing in their rank of life, are of the best and most respectable description. It would signify little, whether such families were of high or inferior standing in society, provided their habits of life enforced on all around them the love and practice of neatness, order, regularity and cleanliness, and the still more essential qualities of integrity and sobriety. In hiring servants it is also desirable to have those whose immediate relatives and connexions are respectable, however poor they may be. Those who hold their relatives and friends in respect, will not be indifferent to their own characters; they will desire to do credit, and not to disgrace an honest parentage, and thus the pride of respectability will be turned to its right use.

In regulating the conduct of servants, it is requisite that the legal points in the business should be known. Indeed, the servant, equally with the master, should understand the rights which are mutually possessed, and in what respect the infringements of these rights on either part would affect their contract: in some cases they would find themselves amenable to legal process. Each party should know that servants may be legally punished for insulance, and for assaulting master or mistress; that they may be fined for drunkenness, gaming, cursing and swearing; that if by their misdemeanour they are legally detained from their master's house, the contract between them is void. On the other hand, if not chargeable with misdemeanour, the master cannot discharge them from his service without paying them that portion of the year's wages which was agreed upon between them on hiring, or allowing them to remain in his service for a stated time after giving them warning, unless the separation takes place by mutual consent.

On this head the usual agreement between principals and household servants is to allow on each side a month's notice to be given, or a month's wages to be paid.

There have been fifty kings, two protectors, and six queens of England; and the regular succession to the throne has been changed ten times since the kingdom of England was founded by Egbert, 1012 years ago.

PURCHASING AND MENDING CHINA.—In purchasing china, it is well to deal with shops that are supplied from known and respectable sources; for a great deal of badly manufactured goods is sold in this kingdom at low prices, frequently hawked about by pedlars, in which the glaze is so slight as to crack after being cleaned a few times in hot water.

When holes are required to be drilled in china or earthenware, for the purpose of riveting it when broken, the usual method is to use a drill made of a splinter of diamond set into a handle, and this is an effectual mode; but as a diamond may not always be at hand for this purpose, it is useful to know that holes may be made in these materials without it. Procure a three cornered file and harden it completely by making the end red hot, and plunging it into cold water; then grind the point quite sharp on a grindstone, and afterwards on an oil stone. Then with the point of this tool, pick repeatedly on the spot to be bored, taking care not to use too much violence lest the object should break. In a short time or in a few minutes, by a continuance of the operation, a small conical piece will be forced out, not bigger than a pin's head, and the hole may afterwards be widened by introducing the point, and working the file round.

The best cement for broken china or glass is that sold under the name of the diamond cement, which is colourless and resists moisture. This is made by soaking isinglass in water till it is soft, and then dissolving it in proof spirit. Add to this a little gum ammoniac, or galbanum and mastic, both dissolved in as little alcohol as possible. When the cement is to be used, it must be gently liquified by placing the phial containing it in boiling water. The phial must be well closed by a good cork, not by a glass stopper, as this may become fixed. It is applied to the broken edges with a camel's hair pencil.

When the objects are not to be exposed to moisture, white of egg alone, or mixed with finely sifted quick lime will answer pretty well. Shell-lac, dissolved in spirits of wine, is better.

A very strong cement for earthenware is made by boiling slices of skimmed milk cheese with water into a paste and then grinding it with quick lime in a marble mortar, or on a slab with a mallet.

Magnesia slightly calcined or what is still better, in a gelatinous state, is an antidote to arsenic, as it rapidly absorbs that poison when administered within a proper period.

The eruption of Mount Hecla ceased on the 5th of April last, having been in uninterrupted action since the 2nd of September in the previous year—a period of seven months and three days.

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