JUNE.

This is the month in which the forest is clothed in its greatest beauty. The foliage becomes intensely green,—so that the eye luxuriates as it wanders over such a gorgeous mass of living verdure. We have frequent thunder storms—and heavy rains, and often sultry heat. Musquitoes and black flies appear, but it is July before they become most seriously troublesome, and especially so to new settlers. In open and well cleared parts, these pests are less known and less heeded. It would save much labour in spring, if farmers would endeavour to anticipate it so far, as to have the manure on the ground, and the ploughing partially performed during the autumn. For, in ill drained land especially, we often find it hard and dry in the spring, turning up in lumps, requiring the aid of a heavy roller, or clod crusher, But if well drained land were ploughed in the fall, it would be in good working order in any spring. No doubt under any circumstances—but more especially on ill drained and rough, and ill communited surfaces in a dry season—the grain sprouts unequally, and very probably will not ripen together, and many of the smaller seeds do not come up during the season. The promise is good this season, so far as can be judged of from present appearances. The prospect of war has already operated in enhancing the value of breadstuffs. The European production of grain will necessarily diminish, while the consumption will as certainly increase. Large numbers of the population in the disturbed districts and countries will be taken away from agricultural pursuits—the labours of the field will be exchanged for active service in the field—and agricultural industry will be temporarily suspended. A large additional supply of food will be required from abroad - the price of grain will rise here as elsewhere. We have a good prospect so far as we can judge at present—and a productive harvest, will enrich our farmers—though we can spare little till it be reaped. Our two pasts harvests have not been abundant—but the present may compensate for the past. There will probably, too, be a largely encreased de mand for our lumber both in the Western and transatlantic markets. Our ship builders will be busy—and thus we may certainly anticipate a considerable influx of capital from these sources. But foreign capital will not seek investment here, and many enterprises, both public and private, will languish, or be temporarily discontinued. Many will be thrown out of employment, and may be probably converted into defenders of their country at home and abroad.

We are glad to find such enterprising gentlemen as the Messrs Renaud and Gregory, importing seed wheat of prime quality—on which they assure us our farmers may safely depend. It has been and will be selected with the utmost care Mr. Shepherd, the seedsman of the Board of Agriculture, has likewise made up his mind to have, against another season, an ample supp'y of Alsyke, and some other choice seeds, and he invites the Canadian farmer to make trial of raising the seed in this country, as he is of opinion it may become a valuable article of export. He will himself—if the trial should prove satisfactory—be prepared to repurchase from the experimenters—and if successful, the traffic might come to be of much importance to both him and them. We would strongly recommend to our Lower Canadian Farmers care and activity in collecting manures, and an economical application of them; and if any portion, at any time, should remain over, to compound it with muck, soil, or some suitable absorbent for future use, instead of allowing it to go to waste by washing or scattering about at the mercy of the winds, and every deteriorating influence. One-half, often two-thirds of their whole manure is lost by carelessness and want of thrift.

Top dressing of meadows ought to be done in the fall or very early in spring. Care should be taken that no fructifying substance should on any account be permitted to run to waste. Caterpillars are very often destructive at this season. Sow a ring round the ground about the stems of the bushes, &c., with a mixture of lime, salt, soot and ashes—others syringe with several liquid compounds—down to the familiar soap suds. Some are so industrious as to pass near the bushes—trapping them smartly on the stems and shaking them so as to dislodge the caterpillars—shedding them on the ground, on a canvass spread to receive them—then immediately consigning them to a tub of water at hand. We shall not be able to say much of our harvest prospects for the present, as this is written too early in the month. This we reserve till next Number of the Journal. The hoe must soon be busy. The weeds must on no account get the start of the growing crops. By rooting up the weeds, and loosening the soil to permit the rootlets of the standing crops to permeate with freedom, they will surely and signally triumph over their parasitical enemies. Peeling of bark will go on in the season. Barley, beans, beets, potatoes, &c., &c., &c., will be sown or planted this and next month. Let draining be continued where required, and when any leisure moment will permit.

Whenever leisure permits, be gradually preparing—draw out and throw up to dry a large pile of swamp muck for future use. If not to be had, collect waste earth from road-sides, and scrapings of every useful kind from every quarter.

Where moles are numerous and especially destructive, it is recommended by some to get quit of them by poison in the following manner. Collect a few fresh worms, and put a little strychnine, or carbonate of barytes in powder upon them, keeping in a box for a few hours, when three or four of them may be laid in each hole run as it leaves the fence or hedge for the cultivated field. Let this be repeated till the intruders disappear. Divide your pasture where requisite, and still incompleted. Be getting hay and harvest tools into proper condition in good time. Turnips, Ruta-bagas and Sweeds will be sown this and next month—all in proper season.

In the United States we have the prospect of large crops of all the staple agricultural products, and the reports coincide from nearly every section of the country. Throughout all the western and northwestern States the crop of wheat promises to be ample, and the breadth is reported greater than usual. It is said North-Carolina and Wisconsin have suffered partially from frost, but this will have no important effect on prices.

In the south-west,—Arkansas, Louisiana and Texas,—heavy frosts have occurred during the last few days of April, seriously injuring the corn, and affecting the cotton through a wide range of the country.

On the banks of the Mississippi great injury has been done by crevasses in the levees, and great extents have been submerged, causing severe losses to the planters. But these losses are but partial, and on the whole, will be, as regards the entire harvest produce, inappreciable. In Virginia the peach crop has suffered severely, and our neighbours must look to Ohio for a supply of this delicious fruit. As with ourselves, the entire crop of this year will be looked forward to with unusual interest—trusting that, under the direction of a kind providence, it may in some degree compensate for the disasters and deficencies of the last year or two. We trust the too threatening danger of another financial crisis may be thus providentially averted. J. A.

TESTING OF SEED CORN.

We have ever been strong advocates for the testing of seed corn, and seeds of all descriptions before sowing—select a fair sample from the mass. Sow in a box, in a good situation, and on examination, even before coming up, it will easily appear whether the seeds—and what proportion of them, is sprouting. Surely it is better to do this, than to make the experiment, on hazard, on a large extent, and risk the years crop. J. A.

MANURES, AND THE PRACTIBILITY OF INTRODUCING THE MANUFACTURE INTO CANADA.

(*Continued.*)

The use of fish as a manure has long been known; on the shores of Scotland, Cornwall, Brittany, some parts of the United States, and on our own sea-coasts, the offal from fisheries, as well as certain bony fishes of little value for food, are applied to the soil with great benefit. The idea of converting these materials into a portable manure was however I believe first carrried into effect in France by Mr. Démolon, who seven or eight years since, erected an establishment for this object on the coast of Brittany and in Newfoundland. For the details of this manufacture I am indebted to the *Chimie Industrielle* of Payen. Concarneau, in the department of Finisterre, is a small town whose inhabitants are employed in fishing for sardines, and it is the refuse of this fishery which is employed in the manufacture of manure. The offal is placed in large coppers and heated by steam until thoroughly cooked, after which it is submitted to pressure, which extracts the water and oil. The pressed mass is then rasped, dried in a current of hot air, and ground to powder. 100 parts of the recent offal yield on an average 22 parts of the powder, besides from 2 to 2½ parts of oil. The manufactory of Concarneau employs six men and ten boys, and is able to work up daily eighteen or twenty tons of fish, and produce from four to five tons of the powdered manure.

This manure contains, according to an average of several analyses, 80·0 per cent. of organic matters, and 14·1 per cent. of phosphates of lime and magnesia, besides some common salt, a little carbonate of lime, small portions of sulphate and carbonate of ammonia, and only 1·0 per cent. of water. The nitrogen of this manure, which is almost wholly in the form of organic matters, corresponds to 14·5 per cent of ammonia, and we may estimate the phosporic acid, which is here present in an insoluble form, at 7·0 per cent. If we calculate the value of this manure according to the rules above laid down, we shall have as follows for 100 pounds:—

Ammonia,—14½ pounds, at 14 cents,..............	$2.03
Phosphoric Acid,—7 pounds, at 4½ cents,..........	0.31½
	$2.34½

This is equal to $47 the ton of 3000 pounds; the manufactured product of Concarneau, howev r, according to Payen, is sold in the nearest shipping ports at 20 francs the 100 kilogrammes, (equal to 220 pounds), which, counting the the franc at $0.20, is equivalent only to $1.81 the 100 pounds, or a little over $37 the ton. This however was in 1854, since which time the price of manures has probably increased.

Mr. Démolon in company with his brother, has also according to Payen, erected a large establishment for the manufacture of this manure on the coast of Newfoundland, at Kerpon, near the eastern entrance of the Strait of Bellisle, in a harbor which is greatly resorted to by the vessels engaged in the cod-fishery. This manufactory, now in successful operation, is able to produce 8,000 or 10,000 tons of manure annually. Payen estimates the total yearly produce of the cod-fisheries of the North American coast to be equal to about 1,500,000 tons of fresh fish; of this, one-half is refuse, and is thrown into the sea or left to decay on the shore, while if treated by the process of Démolon, it would yield more than 150,000 tons of a manure nearly equal in value to the guano of the Peruvian islands, which now furnish annually from 300,000 to 400,000 tons. If to the manure which might be obtained from the cod-fisheries of the Lower Provinces, we add that of many other great fisheries, we are surprised at the immense resources for agriculture now neglected, which may be drawn at a litte expense from the sea, and even from the otherwise worthless refuse of another industry. To this may be added vast quantities of other fish, which at certain seasons and on some coasts are so abundant that they are even taken for the express purpose of spreading upon the adjacent lands, and which would greatly extend the resources of this new mannufacture. The oil, whose extractions is made an object of economic importance in the fabrication of manure from sardines in France, exists in but very small quantities in the cod, but in the herring it equals 10 per cent. of the recent fish, and in some other species rises to 3·0 and 4·0 per cent.

Mr. Duncan Bruce of Gaspé has lately been endeavoring to introduce the manufacture of fish-manure into Canada; but he has conceived the idea of combining the fish-offal with a large amount of calcined shale, under the impression that the manure thus prepared will have the effect of driving away insects from the plants to which it is applied. He employs a black bituminous shale from Port Daniel, and distilling this at a red heat, passes the disengaged vapours into a vat containing the fish, which by a gentle and continued heat, have been reduced to a pulpy mass. The calcined shale is then ground to powder and mingled with the fish, and the whole dried. Experiments made with this manure appear to have given very satisfactory results, and it is said to have had the effect of driving away insects when applied to growing crops, a result which may be due to the small amount of bituminous matter in the products of the distillation of the shale, rather than to the admixture of the calcined residue. Coal-tar is known to be an efficient agent for the destruction of insects, and in a recent number of the journal, *Le Cosmos*, it is stated that simply painting the wood-work of the inside of green-houses, with coal-tar has the effect of expelling from them all noxious insects. M. Bruce caused several analyses of this shale to be made by Dr. Reid of New-York, from which it appears that different specimens contain from 3·0 to 26·0 per-cent. of carbonate of lime, besides from 1·4 to 6·7 per cent. of gypsum, 2·0 per cent. of iron pyrites, and from 4·5 to 6·7 per cent. of carbon remaining after distillation, The amount of volatile matter, described by Dr. Reid as consisting of water, naphtha and ammonia, was found by him in two different samples to equal only 3·5 per cent., of which a large proportion is probably water.

I have examined two specimens of manure prepared by M. Bruce from the fish commonly known as the menhadden (*Alosa menhadden*). No. 1 was made with the Port Daniel shale, as before described; while for No. 2, this was replaced by a mixture of clay and saw-dust, which was distilled like the shale, the volatile products being added to the decomposing fish. The oil which rose to the surface of the liquid mass had been separeted from the second preparation, but remained mingled with the first. Both of these specimens were in the form of black granular mass, moist, cohering under pressure, and having a very fishy odour. A proximate analysis of these manures was first effected by exposing a weighed portion to a temperature of 200o F. till it no longer lost weight, and then calcining the residue, from which the carbonaceous residue very readily burned away. The oil in the first specimen was obtained by digesting a second portion, previously dried, with ether, so long as anything was taken up. The solution by evaporation left the oil, whose weight was deducted from the loss by ignition. The portion of oil remaining in the second sample was not determined.

	I.	II.
Animal matters and carbon,	23·7	21·0
Oil,	6.6	
Water,	13·5	21·8
Earthy matters,	56·2	57·2
	100.0	100·0

The residue of the calcination was digested with hydrochloric acid, which dissolved the phosphate of lime from the fish-bones, together with portions of lime, magnesia, alumina, and oxyd of iron, derived from the shale and clay. The solution from No. 1 contained, moreover, a considerable portion of sulphate from the gypsum of the shale. Small quantities of common salt were also removed by water from the calcined residues. The dissolved phosphoric acid, lime, and magnesia were separated by precipitating the phosphoric acid in combination with peroxyd of iron, from a boiling acetic solution, and were determined according to the method pf Fresenius. The nitrogen of the organic matter was estimated by the direct method of burning a portion of the dried substance with soda-lime, and weighing the disengaged ammonia as ammonio-chlorid of platinum. The results were as follows for a hundred parts :—

	I.	II.
Phosphoric acid,	3·40	3·99
Sulphuric acid,	2·16	·15
Lime,	5·90	4·44
Magnesia,	1·20	1·15
Ammonia,	3·76	2·60

If we calculate the value of the first specimen according to the rules already laid down, we have as follows for 100 pounds :—

Phosphoric acid, 3 4-10 pounds at 4½ cents,......	$0·153
Ammonia, 3½ pounds at 14 cents,..............	0·525
	$0·678

At 68 cents the 100 pounds, this manure would be worth $13·60 the ton. The sulphuric acid is of small value, corresponding to 80 pounds of plaster of Paris to the ton, and we do not take it into the calculation. The somewhat larger amount of phosphoric acid in the second specimen, is probably derived in part from the ashes of the saw-dust, and in part the clay. The value of this manure would be $10·88 the ton.

In order to arrive at the real value of the animal portion of this manure after the removal of the oil, we may suppose, since Dr. Reid obtained from the shales from 4·5 to 7·6 per cent. of fixed carbon, that with the 56·2 parts of calcined residue, there were originally 3·7 parts of carbon derived from the shales. This deducted from 23·7 parts leaves 20·0 of nitrogenized animal matter in 100 parts of the manure. yielding 3·76 parts, or 18·8 per cent. of ammonia. This matter consists chiefly of muscular and gelatinous tissues, and Payen obtained from the dried muscle of the cod-fish, 16·8 per cent. of nitrogen, equal to 20·4 of ammonia. The 3·4 parts of phosphoric acid in the manure will correspond to 7·4 of bone-phosphate, and if to this we add for moisture, impurities, etc., 2·6 parts,=30·0 in all, we should have for 100 pounds of the fish when freed from oil and dried, the following quantities of ammonia and phosphoric acid —

Ammonia,—12½ pounds at 14 cents,..............	$1·75
Phosphoric acid,—11½ pounds at 4½ cents,.........	0·51
	$2·26

The matter thus prepared would have a value of $45·20 the ton, agreeing closely with that which we have calculated for the manure manufactured from sardines in France, in which the quantity of ammonia is somewhat greater, and the phosphoric acid less, giving it a value of $47 the ton.

Prof. George H. Cook of New Jersey, in an analysis of the menhadden, obtained from 100 parts of the dried fish, 16·7 parts of oil, besides 61·6 of azotized matters yielding 9·28 parts of ammonia, and 21·7 of inorganic matters, &c., containing 7·78 of phosphoric acid. If we deduct the oil, we shall have for 100 parts of the fish, according to this analysis, 11·2 of ammonia, and 9·3 of phosphoric acid.

By comparing these figures with the results calculated for the animal portion of Mr. Bruce's manures, we find :—

	Ammonia.	Phosphoric acid.
Manure from sardines (Payen),..........	14·5	7·0
Dried menhadden (Cooke),...............	11·2	9·3
Manure by Mr. Bruce,.................	3·75	3·4
" " (excluding shale),....	12·5	11·3

The proportion of phosphates is of course greater in the more bony fishes. In the manure of Mr. Bruce there are doubtless small amounts of phosphoric acid and ammonia, derived from the shale and the products of its distillation ; but these do not however warrant the introduction of an inert material which reduces more than two-thirds the commercial value of the manure. The results which we have given clearly show that by the application of a process similar to that now applied in France and in Newfoundland, which consists in cooking the fish, pressing it to extract the oil and water, drying by artificial heat, and grinding it to powder, it is easy to prepare a concentrated portable manure, whose value, as a source of phosphoric acid and ammonia, will be in round numbers, about $40 the ton.

We can scarcely doubt that by the application of this process a new source of profit may be found in the fisheries of the Gulf, which will not only render us independent of foreign guano, now brought into the Province to some extent, but will enable us to export large quantities of a most valuable concentrated manure, at prices which will be found remunerative.

I have the honor to be,
Sir,
Your most obedient servant,
T. STERRY HUNT.

ATMOSPHERIC INFLUENCES UPON SOIL AND VEGETATION.

Showing the nature of the atmospheric influences upon soil and vegetation, as affecting the amount and value of the produce including the modification of these influences arising from heat and cold, dryness and moisture.—(continued.)

We shall next proceed to a brief analysis of vegetable bodies ; and it will be seen, as we progress, how dependant they are on atmospheric influences. If we pursue the analysis of vegetable substances as far as the state of our chemical knowledge will permit, we find them to be chiefly composed of carbon, or charcoal, hydrogen and oxygen gasses, and, in some cases, nitrogen also in small proportion. The common Earths, the alkaline earths, and the alkalies themselves, iron, and manganese are sometimes detected in very small proportions, and constantly varying in the same individual.

However, in order to obtain the valuable and peculiar economic or useful product or principle of each plant, we must not go so far in our analysis ; otherwise we shall resolve this product or principle itself into the simple constituents we have already named. The methods of obtaining the peculiar valuable product or principle contained in each plant by ingenious and ordinary processes are very various, and it would occupy much time to investigate them, even in part and we shall not therefore go into the subject at present. However, we may perhaps hereafter glance at some of their products, as illustrative of our subject, whenever we can do so conveniently, and to purpose. We shall here content ourselves with stating that the original constituents of vegetables unite together, and are absorbed by growing plants under the influence of light and heat ; and are so blended by the inherent power of the vital principle in the vegetable organization, as to be converted into their tender and proteus-like texture, and constitute the various substances, both solid and liquid, of which plants are composed. By this process, water and carbonaceous matters are resolved into their simple constituents, combined together in certain unions, and these constitute the solid portions. Hydrogen separates from the Oxygen, and enters into union with carbon to form oil, resin, gum, and other matters, and the superabundant oxygen escapes in the gaseous form or in union with caloric.

It has been found by frequent trial, that vegetable substances generally vary much in their properties, according as they contain more or less oxygen. When they contain a large proportion of oxygen for their quantity of Hydrogen, taking water as the standard, they are always acid—when they contain a small proportion they are generally resinous, oily, or alcoholic ; and where the oxygen and hydrogen are in nearly the proportion to form water, they are generally in a state resembling sugar, gum, mucilage or starch, or woody fibre.

We shall now endeavour to discover how the atmosphere acts, and is reacted upon, in the beautiful and secret process of germination and vegetation. When a seed is buried in the ground, care must be taken that it is not buried too deep, otherways, although its vegetative powers may not be destroyed, yet, by placing it at such a depth, it will not germinate. It is thus deprived, at all events, of one of the primary conditions necessary to germination, the presence of oxygen gas, which we have shown to exist as a principal constituent of the atmosphere. Neither will germination take place without the aid of moisture ; and a temperature of 32 Far : is not sufficient for its developement ; as water, the great vehicle of vegetable nourishment, everywhere, at this degree, assumes the solid form, and is thus incapable of supplying nutriment to vegetables. The specific temperature required depends much on the nature of the plant ; as also does the depth at which the seeds will germinate.

The first process towards germination, after the seed has been sown, is the absorption by it of moisture through the hilum, that part, or point, by which the seed was originally attached to the parent, and through which it derived nourishment during the period of its growth,—imbibed the juices of the mother plant. Soon after a quantity of carbonic acid gas is expelled, and replaced by a corresponding volume of oxygen derived from the atmosphere. During this process a considerable degree of heat is produced, and this is an unfailing consequence of the condensation of oxygen. The measures of hydrogen and oxygen,—by the absorption of these two constituents of air and moisture,—are increased, and that of carbon diminished :—and one can easily satisfy himself, by an examination, of the change wrought in the substance of the seed. The farinaceous matter has been converted into starch, gum and sugar,—the solid substances have changed into a sweet mucilaginous fluid, which appears to be the appropriate nourishment for the embryo. The young root is the first part which appears in all cases, but the future process is not uniform in all plants. A seed contains the embryo embedded in one, or between two or more seed lobes, or cotyledones. In plants with one cotyledon, called monocotyledones, as in the cereal grasses, the farinaceous cotyledon, or, as it is sometimes called indeed, albumen, seems merely intended to nourish the embryo with its own proper substance in its early stages. In plants with two cotyledones, decotyledones, as in the Field Bean, it is different. So soon as the root of the embryo is fairly established, the cotyledones swell and expand, ascend out of the soil, and, assuming the green colour and functions of leaves, for a time, until the plumule, seated between them, gains strength and expansion, and can dispense with their offices, take the charge of supplying the nascent germ with nutriment, when they quickly wither away and disappear, the object of their existence being accomplished. Some plants have several cotyledones, but their germination differs in no respect from those we have last been describing.

Now let us consider how far the atmosphere is concerned in, and affected by, the process of germination. We have said that carbonic acid is evolved by the seed, and thus *added* to the atmosphere ; and that its place is supplied by a corresponding quantity of oxygen *derived from* the atmosphere. The indistructibility of seeds is thought to be partially insured by the great natural deposit of carbon contained in them, when well ripened,—its conservative properties being well ascertained. We have seen if cold prevails, so as to cause a fall in the temperature to 32 Fahr, germination cannot proceed. Therefore that heat is required in the process, varying with the species, or individual. We may add that perfect dryness, or absence of moisture, is as fatal to germination as its solidifying into ice ; and it is necessary that the supply of moisture from the atmosphere should constantly increase with the rate of evaporation and increase of temperature. A superabundant supply of moisture in the soil is nevertheless most destructive and inimical to the ultimate perfection of the crops usually cultivated in this country. Soil injuriously wet contracts sourness, and this tends in a cold climate to produce coarse and unprofitable herbage, if not absolute barrenness, and is incapable of affording wholesome nourishment to cultivated vegetables. The whole body of the soil becomes saturated with stale and unwholesome matter, which completely fills up the interstices, (cells and atomical pores) of the soil,—thus excluding the free action of the purifying current of atmospherical air, which is absolutely necessary to the healthful developement of useful vegetation in a cold country—more particularly ; and such surfaces become covered , where not absolutely barren, with aquatic and subaquatic plants, to the exclusion of more profitable vegetation. We find, in cold countries, in such localities, Galium Palustre, white water bedstraw—Pinguicula Vulgaris, common butterwort, Rhinanthus Crista Galli , Common Yell or Battle—Lychnis Flos Caculi, Cardamine Pratensis, Meadow Ladies-smock—Pedicularis Sylvatica, Common Lousewort—and others, besides some species of Juncus and Carex, and such comparatively useless vegetation. We have said that the moisture may, and usually does, encrease with the temperature, except when arid deserts abound and such other extraordinary preventive causes are operating. In such situations we generally find plants furnished with many cortical pores and great powers of absorption, but exhaling little, and they are thus admirably adapted to the locality, bearing striking testimony to the unerring wisdom of omnipotence, which is nowhere in nature more beautifully exhibited than in the delicate structure, the brilliant blossoms, and the endless, inexhaustible and invaluable products of the vegetable creation. The Rice crop so much valued by the aborigines of this country, and which has no doubt, in

China and elsewhere mainly contributed to the early civilization of its numerous population, requires very different treatment from those of the ceralia cultivated in cold countries ;—but this is only another appeal to our gratitude for this other instance of the many invaluable gifts everywhere presented by the profuse and generous bounty of unwearying nature.

Perfect dryness would effectually prevent germination. In proof of this the vitality of seeds may be preserved for an indefinite time, although exposed to a high temperature, if kept dry. But even moisture, if the seed be excluded from the action of air, will not produce fermentation, and this is proved from the observation of what takes place with seed that has been buried deep below the surface, when exposed for sometime to the action of the atmosphere. Even moorland and peaty soils become not unfrequently covered with white clover (Trifolium repens) instead of heath *Erica* and various species often appear that dit not previously occupy the surface. We may conclude this branch of our subject by remarking, that light is prejudicial to germination, although we shall find it to be a powerful agent in perfecting the future growth of vegetables.

We have now the vegetable completely formed, but it is necessary that we should explain its future growth and enlargement. By its roots then, nourishment is imbibed from the soil. The root is composed of two parts, the caudex, or body and the Radicula or Fibre. The extremities of this latter portion, which imbibes its nourishment from the soil, is annual, or produced within the year and universally present. The greater portion of the nutriment of plants is, no doubt, drawn through this source. The soil is composed of several earthy ingredients, mingled with decomposing organic matter, and containing, enclosed in its minute pores, a supply of moisture derived from the atmosphere, and permits through its interstices, to the proper depth for germination, the free permeation of the atmospheric air. The contained moisture enters into union with the organic and inorganic decomposing substances, and presents them, so dissolved and altered, to the absorbents of the radicles, by which, from the action of the light and heat on the parts of the plant, more particularly those exterior to the soil, the irritability of its sap vessels is increased, and its powers of radical absorption proportionally excited. By the force of the vital principle in plants, the chemical affinities of the primitive substances constituting organic bodies are modified, and their action on each other is differently regulated, and restrained by different laws during the presence of that vital principle ; and this modification of action, the result of the temporary suspension of the laws of chemical affinity, determines and preserves the peculiar and distinguishing character of the individual. The substances above described, after absorption by the roots, and digestion and partial alteration in this part, ascend as has been satisfactorily proved by the ingenious labours of Darwin and Knight by the spiral common, or sap vessels encircling the medulla, or pith, to the leaves, blossoms and even fruit and seeds, each part having a separate number, or set, suited to itself ; and they thus reach from the annual root-fibres direct to the termination of every part of each annual shoot of the plant. The ascent of the sap is believed to be caused by the action of light and heat, aided perhaps by the movement in plants caused by the winds. It is well known that in winter when light and heat are less intense, the flow of the sap, or nourrishing juices does not take place. The root and this system of sap vessels we have been describing may be considered, then, as the stomach, lacteats and arteries of vegetables. In the leaves the sap, passing through the minute ramifications of these vessels, distributed over their surface, is exposed to the action of light, air and moisture : and while much useless matter it perspired, exhaled or given off, the juices are changed, and more fully adapted to the wants of the vegetable economy ; and by the action of these three principal agents, various secretions, are formed which, after imbuing the leaf itself with certain qualities, return by another set of vessels or tubes, called the proper vessels, seated in the new, or inner, annual layer of bark, yielding in their course all the juices and properties peculiar to the plant, and also enabling the new layer of bark to secrete matter for a new layer of alburnum in the following year. The leaves would thus appear to act as the lungs do in the animal creation. The spiral, or common, or sap vessels we find mentioned pass into the flower and even the fruit and seeds, which when perfected, a separation of vessels takes place, and they fall ripe to the ground. There are no returning vessels, be it remarked, from these parts ; the nourrishing juices that flow thither being wholly appropriated to the perfecting of their valuable products.

Having described the theory of germination and vegetation, and the action of the atmospherical influences generally, occasionnally glancing at the effects of light, heat and moisture on this process, we now come to consider the effect of these influences as regards the amount and value of the produce.

We have shewn that germination cannot proceed without a certain degree of heat and moisture, and the action of the atmosphere. We have seen that vegetables add carbonic acid gas, to the atmosphere during germination, and take from it a corresponding quantity of oxygen. That necessary moisture is originally drawn from the same source. That when the temperature is reduced to the freezing point, moisture is solidified in the soil, and thus prevented from entering into new combinations, and also from penetrating the hilum of the seed, and of course, in the farther progress of the plants, the pores of the radicles. We must here mention however a curious fact ; that as the plants derive, generally speaking, the greater portion of their natural nourishment from the soil, many of them, as, for instance, the air plant, live, if merely suspended in the atmosphere. Yet even these cannot survive if the air is long very dry,— deprived of moisture. All plants imbibe moisture from the air by their leaves, in the same manner as the air plants do. When the soil has been long parched, nature has endowed vegetables with the power of absorbing by their leaves moisture from the atmosphere ; and, during the night, in very low and warm latitudes particularly, and, indeed, in all, the leaves have yet a still more important power of reducing their temperature by radiation, and, thus becoming colder than the surrounding air, when exposed to the aspect of the sky,— acquire dew, by means of which they continue to preserve the life of the plant long after the moisture in the air has been exhausted. In the transplanting of annuals too, a familiar operation, we find the leaves supply nourishment to the p'ant, till the roots have in some measure recovered the shock of removal.—(*To be continued.*)

J. A.

INFLUENCE OF SOIL ON VEGETATION.

(*Continued.*)

I.—SILICA.

Silica, or more familiary, sand, for it is chiefly composed of silica, is, in nature, never found pure, being generally coloured by some substance, and often in combination with Lime, when it is teimed calcareous. It is the most generally diffused of the Earths, and is therefore entitled to the first place. It is unnecessary to waste time in a minute description of its appearance. It is, when pure, a colourless, hard, sabulous, gritty substance, and very difficult of reduction by attrition. It enters into the composition of much the greater number of rocks and minerals, and is thus of universal occurrence. It is found in large deposits in the beds of Rivers, and the Ocean shores, and in these situations it is abundant from the circumstance that, in the progress of the decomposition of the various Minerals containing it,—being of itself compact and heavy, and difficult of pulverisation, it is usually precipitated, when the more transportable and lighter integrants are borne along to a lower level by the current. This accounts for the comparative sterility of many valleys in high countries, the soil being chiefly composed of Silica, in various states of comminution, the carrying or transporting power of the stream decreasing with the level. It is very insoluble, though several springs hold it in solution, associated with Carbonic Acid Gas; but on exposure to the air, the Carbonic acid escapes, and the silica falls to the bottom of the liquid, a mechanical precipitate. This indeed is one cause of its appearance in some localities. It is rendered much more soluble when associated with an alkali, potassa for an instance; and, when so associated, is soluble to a certain extent in water containing carbonic acid. Rain water contains carbonic acid, and this may be instrumental in reducing the substance we are describing, so associated, to a condition suited to the powers of absorption or extraction with which vegetables are endowed. It was found by Sir Humphry Davy in the Epidermis of the Order Gramineæ. Burnt wheat straw is employed to give the last finishing polish to marble, and its efficacy depends on the highly comminuted silicious matter which it contains; and we may give as another example of this, the Equisetum Hyemale, which contains this substance in such plentiful abundance, that it is used as a natural file in some manufactures. Compact Metals even cannot resist its power. It is the chief component of common flint and Quartz Rock. It enters into the composition of all soils. It does not readily combine with acids. When it abounds, soils are denominated silicious. It is quite destitute of cohesiveness. It is applied to various useful purposes in the arts and manufactures ; but this is beyond the limit of our present investigation. It has very little affinity for moisture—decomposing organic substances adhere to it very loosely. It usually, increases in excess, as soils characterised by it sink in the scale of fertility. It is usually found in nature, coloured brown, or brownish yellow ; and sometimes yellow, approaching to white. The colour is generally communicated by oxide of Iron. Some sands contain carbonate of lime, as that on the seashore in many places, from the decomposition of the shells of various shell fish ; and they are thus denominated calcareous sands. This materially enhances its value in an agricultural point of view ; and it is, when this substance is combined with it, extensively used in practice as a manure and top dressing. The presence of carbonate of lime is easily determined by mixing a proportion of the soil supposed to contain it with an acid, when effervescence will take place,—if lime be present. Its value depends solely on the proportion of carbonate of lime present. Silica is a compound substance, consisting of 48 parts of a base, called silicon, a substance that bears a considerable resemblance in many respects to a metal, although not now classed with metals,—and 52 parts of oxygen gas ; and both these substances are believed to be simple or primary. It is therefore styled, in chemical language, an oxide of silicon.—Soils are termed silicious when they contain from 6 to 7 eights of silica ; and, when mixed with small stones and pebbles of this substance, gravelly. Soils cantaining silica in excess range low in the scale of fertility.

II.—ALUMINA.

Alumina the most diffused substance. This earth differs from silica in being smooth to the feel and not gritty. It is not soluble in water. It also differs in having a great affinity for moisture, and in adhering intimately to all decomposing organic substances. On these properties mainly depends its excellence in an agricultural point of view. It is usually in nature coloured variously by oxide of Iron and other substances. It differs from silica in combining readily with acids, and in forming with these various soluble salts. It differs also from silica in its adhesive and plastic properties ; and, when it prevails too much in soils, they are thereby rendered too retentive of moisture, and consequently wet ; and, often, when they dry up, they become indurated by drought, and so compact and impervious as to prevent the free extension of the roots of vegetables. In excess, therefore, it operates injuriously on vegetation, and in a manner directly opposite to silica. Some of the most fruitful soils contain a large, and all such a considerable proportion of alumina in a state of minute division ; and those containing it in large quantity are familiarly denominated Clay, or wheat soils Alumina resembles silica in being a compound of oxygen and another simple substance or base ; but in alumina that base is a true metal. That metal is denominated aluminum. Alumina is therefore in chemical language an oxide of aluminum,—a metallic oxide. Soils containing a fourth or even a fifth of impalpable powder, and this chiefly composed of alumina, may be classed among clay soils. Alumina is computed to form about a fourth part of the Earth's crust, and it enters into the composition of very many minerals and rocks, and is therefore of frequent occurrence ; but by no means so plentiful as silica. We now come to consider the next most frequent and most important earth, and well known under the familiar appelation of

III.—Lime,

which in soils is generally found in the state of a Carbonate. Such soils are often called calcareous. In this form it is present in all fruitful and valuable soils. Where it is present in quantity, it communicates the character of a loam, and a loam is the most perfect and desirable of all soils. Such soils are admirably adapted for all crops. When a soil contains a large proportional quantity of impalpable and finely divided powder, to the extent of about a half to a third, and the principal part of this powder is composed of carbonate of lime, with soluble organic matter, then it may be classed amongst loams. Lime, or, as it is often called, quick lime, or caustic lime, in contradistinction to mild lime, or carbonate, has a powerful affinity for carbonic acid and moisture, and readily enters into various combinations with acids, and, with them, forms various salts. It effervesces most powerfully while combining with acids, and is thus, as has been stated of calcareous sands, easily detected. Some of these are found in nature. Carbonate of lime is soluble in water containing carbonic acid. Rain water for instance, and is thus so far prepared for recombination and absorption by vegetables. Soda and potassa too, assisted by moisture, constantly operate in soils in reducing the salts of lime, and in restoring this substance to a state of purity, when it is again prepared to act afresh on the organic and inorganic elements with renewed vigour, abstracting from organic substances carbonaceous matter and oxygen, dissolving organic substances, and, at the same time, itself becoming a carbonate. Combined with an equal weight of sulphuric acid it becomes the well known native substance called gypsum, which is extensively used in the United States of America and in other countries as well as in Britain as a manure and top dressing, and it is supposed to be the ingredient in Dutch ashes on which their powers of fertilization mainly depend and it is *peculiarly* beneficial to some crops. Lime is believed to be the most active and important ordinary element in promoting fertility in soils, next to organic substances ; and its importance is enhanced by its cheapness in most districts. In its caustic state, as quicklime, it powerfully facilitates the decomposition of insoluble organic matter, by reducing substances of this description previously insoluble, combining with them in part, but restoring the organic substance, thus temporarily appropriated, in uniform and enduring quantity, and thus, in the end, promoting permanent fertility. It is invaluable in its caustic state in soils replete with insoluble organic matter. It differs from silica in its affinity for carbonic acid and water, and resembles alumina in this latter respect. Even clay soils become more valuable as they approach the state of loam. It will be hereafter shown that soils of the richest and most fruitful description frequently contain carbonate of lime in very great quantity, and, from its affinity for moisture, and constant action with organic substances, both in the way of decomposition and recomposition, or combination, and from the exercise of similar influences on the in organic ingredients of the soil, and some of these ingredients again, as the alkalies, reacting upon the various salts of lime, and setting it free, and thus, as has been said, restoring it to a state of purity and renewed activity, a permanent action promoting separation and transfer, and comminution and recombination of the elements is continued, and constantly kept up ; and this is very friendly to the extension of the roots of plants, and the attracting and permitting also of the free action of the atmospheric influences permeating its body from the surface downwards in every direction ; and these influences operating freely on the components of the soil, a perpetual supply of elaborated nourishment is presented to the root fibres of the various vegetables growing on its surface. Lime, or quicklime, is a compound of equal parts by weight of a metal called calcium and oxygen. It is therefore, in chemical language, a protoxide of calcium. In nature it is most plentiful as has been already said in the state of carbonate. Carbonate of lime is a compound of equal parts by weight of the protoxide of calcium and carbonic acid. Carbonate of lime is found in great masses in nature, and as reduced to a state of powder by expelling the acid, and thus rendered capable of regular distribution and easy application to the soil. These native masses are first displaced by the aid of gunpowder and the lever, and thereafter reduced by pounding to small thin pieces or fragments. These fragments are burnt up with coal in kilns constructed for the purpose, and by a strong heat the carbonic acid is expelled, and the weight of the native carbonate thus considerably reduced. That stone is the best which loses most weight in burning. It is then usually slaked with water, which reduces it to powder, and is distributed over the soil. Sometimes the atmosphere is allowed to slake it in heaps ; but this is considered slovenly management in practice. When slaked, it becomes a hydrate, which is in chemical language, descriptive of a substance in union with water. It is used in this way for preparing wheat soils, and less manure suffices, if lime he applied at the proper time. It is very improper to apply caustic lime when there is a good proportion of *soluble* organic matter in the soil, unless a proportionate quantity of organic manure be supplied at same time. But when judiciously applied, it is of more service in sands and light soils than even in clays, making them, in the long run, tolerably compact and retentive, when combined with the free use of organic manures. After draining, lime is a sure corrective of acidity, or sourness, in soils, arising from the effects of the long previous existence upon them of a coarse and unprofitable vegetation. Nitrate of lime is sometimes found in soils, a salt of lime compounded of equal weights of protoxide of calcium and nitric acid. Phosphate of Lime, composed of equal weights of protoxide of calcium and phosphoric acid, exists in quantity in the straw and seeds of both grain and pulse crops, and may be so far necessary to their successful cultivation ; and is contained and applied in *bones*, for instance ; and indeed all excrementitious manures tend to its production and encrease in soils. Our notice of lime has extended to some length ; but it was quite unavoidable to give anything like a satisfactory account of its influence on vegetables.—(*To be continued.*)

J. A.

SCOUR IN A HEIFER.—Give a good dose of Epsom salts, with one-half oz. ginger on a quart of warm ale, and when its effects are over, give 1 oz. prepared chalk, 1 drachm opium, 5 drachms catechu, and two drachms ginger, morning and evening, on thick gruel.

THE MEAT MANUFACTURE.—"It is true we are enabled to get corn from our neighbors by paying for it, but meat we cannot get.... The more meat you make, the more manure you produce, and the more corn you grow."—MECHI.

Without entering upon the elaborate details of each experiment which are given by Mr. Lawes, it is only necessary that we allude to the general summary of results, which contain some interesting particulars.

PARTICULARS.	Hants. 26 weeks.		Downs. 26 weeks.		Cotswolds 26 weeks.		Leicesters 26 weeks.		Crossbred Wethers. 26 weeks.		Crossbred Ewes. 26 weeks.	
	lbs.	oz	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Average weight per head when put up.......	113	7	88	0	119	13	101	5	95	1	91	4
Average weight per head when fat (including wool)..............	183	1	140	12	183	7	145	14	139	9	133	12
Average total increase per head...........	69	10	52	12	63	10	44	9	44	8	42	8
Average increase per head weekly.......	2	10¾	2	0¼	3	2¾	2	3½	2	3½	2	2
Average increase per 100lbs., live weight.	1	12¼	1	12¼	2	1	1	12¾	1	14¼	1	14

REGISTER OF IRISH SHORT-HORNS.—Having for some time past deferred the issue of the Register, in consequence of a request made by different parties who were anxious to enter their calves of this year, and their purchases at the spring show, in the first issue, we have now to request that application for the necessary forms may be sent to us without further delay. We would further beg, with relation to this subject, to refer our readers to the remarks which we made regarding the nature of the *Register*, and which appeared in our comments on Mr. Luke Christy's letter, in the GAZETTE of April 9th. We can only further say, that the greater the publicity is given to pure-bred stock, or to stock assuming to be such, so much more beneficial will it be found for the owners. Having one's light under a bushel is not the way to get on now-a-days ; and we could instance a certain case which occurred at no very remote date, where several parties who would have been good purchasers did not attend the sale, solely because they had no previous information regarding the herd. That, however, is a matter which is quite in the hands of breeders and owners. We are desirous of giving them every facility for publicity, and it is their own blame if they do not avail themselses of the means afforded them for this purpose.

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

AGRICULTURAL DIPLOMA.

The Highland and Agricultural Society of Scotland have recently brought to a successful issue what may be regarded as the first step in an important improvement on agricultural education. On Friday last the "Council on Education," after receiving the report of the board of examiners, resolved to confer the agricultural diploma to those gentlemen who had successfully passed a searching examination on the previous Wednesday. Several years ago, chiefly, we believe through the representations of Professor Balfour, the Highland Society resolved to take steps to encourage the proper education of young agriculturists, by directing them to a suitable course of study, and by examining and certifying their successful prosecution thereof. To carry out this resolution, however, her Majesty's authority was necessary; and a petition praying her Majesty to grant a supplementary charter empowering the society to appoint a committee, with the requisite powers, was sent to the proper quarter. For reasons, which need not here be entered into, the late Lord Rutherford (then Lord Advocate) declined to support the petition, and it was vain to press it. The project, accordingly, remained in abeyance till 1856, when the supplementary charter was granted, and the society was authorized "to constitute and appoint a committee, to be called 'the Council of the Highland and Agricultural Society on Education,' and which council shall consist of the following members—viz., the President of the said society, the Lord Justice General of Scotland, the Lord Advocate of Scotland, the dean of the Faculty of Advocates, the Professors of Agriculture, Anatomy, Botany, Chemistry, Natural History, and Technology in the University of Edinburg—all for the time being—and seven other members of the said society, to be chosen from time to time by the directors of the said society, and approved of at a general meeting thereof, of which council the president of the said society shall be president, and five of its members shall be a quorum; and her Majesty thereby empowers and requires the said council to appoint a board of examiners and to grant to students in agriculture diplomas bearing the corporate seal of the said society, and certifying their proficiency in the arts and sciences connected with agriculture." This council, after long and anxious deliberation, agreed to require from each candidate two years' co-operation in the practical management ef a farm, under proper superintendance; attendance of two courses of lectures on agriculture, and on one course of chemistry, natural history, botany, and veterinary medicine; whilst, without specifying formal attendance, the candidate is required to be acquainted withthe agricultural applications of technology with field engineering and surveying, with farm mechanics and architecture, and with book-keeping. As this curriculum embraced four years, it was resolved that for a period of two years from and after the 1st January, 1858, the board of examiners should be at liberty to dispense with the required certificates "of attendance, and to recommend for diplomas parties who, on examination *alone*, shall have been found possessed of qualifications and acquirements of a high order, and whose education has been undoubtedly worthy of the honour sought for."

Two examinations of students coming within the scope of this resolution have accordingly been held. At the examination in April last year three candidates offered themselves, and one (Mr. Jacob Wilson, Mannor House, Morpeth) received the diploma. This year eight gentlemen enrolled themselves. Two were prevented from appearing by illness or other causes. Six were examined. One was rejected. One was proficient in all the branches but one—namely, practical agriculture, and was remitted for a year to re-study that - a subject of cardinal importance. One had not reached the statutory age of twenty-one, and accordingly was not formally examined on agriculture, for which he will come up next year. On all the other branches he passed with the highest distinction. Three candidutes received the diploma, the first place in honour being assigned to a Scotchman. The classsified list was as follows:—

1. John Milne, Mains of Laithers, Turriff.
2. William Henry Eley, Cobham, Kent.
3. Thomas Rome, Groundslow, Staffordshire.

4. Hewens Walton, Fenny Compton, Warwickshire, passed in the scientific branches, but, being too young to receive a diploma, comes up next year on agriculture.

The subjects of examination and the several examiners were as follow :—

Science and practice of Agriculture, Mechanics, and Architecture of the Farm —Professor John Wilson, John Finne, Swanston, Robert Russell, Kilwhiss, and John Wilson, Edington Mains.

Botany—Professor Balfour.
Chemistry—Professor Thomas Anderson.
Natural History—Professor Allman.
Technology—Professor George Wilson.
Veterinary Surgery—Professor Dick.

Field Engineering and Surveying—John Miller of Leithen, C. E., and James Stirling, C. E.

Book-keeping and Accounts—Kenneth Mackenzie, accountant, and Peter M'Lagan, jr. of Pumpherston.

The names of the examiners given above are sufficient garantee of their capacity and impartiality, and few, we suppose, will question that a candidate who passes creditably an examination on the subjects required is entitled to an agricultural diploma. Students are left a very wide choice as to the schools or farms they may attend. The examiners are unpaid, and examine in groups, so as to act as assessors to each other. Altogether, we cannot but regard the Highland Society's scheme as an important step in the right direction, and as we are confident that the candidates who have appeared before the board of examiners can testify to the examinations having been conducted in a fair and kindly spirit towards them, we trust that next April, when the formal regulations come into operation, there will be no lack of new applicants. There can be no question that, *ceteris paribus*, agricultural appointments will be given to holders of the diploma in preference to others.—*Scotsman Newspaper*.

WATER PIPES OF HYDRAULIC CEMENT.

A dozen or more inquiries, recently received, will be answered by the following article which we published in the *Agriculturist* for May, 1851. Mr. Henderson, of Bowling-Green, Va., put down in the Spring of 1855, some 600 feet of pipe, 1¼ inches in diameter, for the purpose of conveying water from a spring to the barn-pard. He used for the purpose 10 barrels of cement, which cost $15, or $1 50 per barrel, at the Rockbridge mills.

His method of constructing the pipe is as follows : The dry cement is thoroughly mixed with an equal quantity of sharp sand, and portions of it made into mortar, only as fast as required for use. For a mould, two pieces of two-inch plank are taken, say four inches in width, and six feet in length. These are hollowed out on one side, so that when placed together, a hole would be left through the centre. They are then put down edgewise in the bottom of the ditch where the pipe is to remain, but are set apart three or four inches, so as to leave a suitable space for the mortar between them. They are kept apart by another small end-piece of plank, rounded upon its two edges to fit the hollows in the two side pieces. This forms a kind of open trough or mould, six feet long and four inches deep, having the ground for the bottom ; the hollow plank for the sides, the last piece of pipe formed, for one end, and the small end-piece for the other.

Through the centre of the end-piece a hole is bored, of the size of the internal bore of the pipe. Through this hole a round, smooth, wooden rod is thrust, which is continued along the middle of the mould, and into the hole in the last piece of pipe formed. When thus arranged, the mortar, just prepared, is poured in, and soon becomes hard. As soon as the mortar is set, the rod is drawn out carefully, leaving a smooth round hole.

The side pieces are then taken off, and moved along for another six feet. These may be kept in place by the sides of the ditch, if it be of the proper width ; but it is better to prepare a couple of iron clamps, say like a wide plow clevis, which can be set down over them to keep them from falling outward, and taken up when the side pieces are to be moved.

The whole process is very simple, and can be rapidly performed, and we should judge, quite cheaply. As soon as complete the whole pipe should be allowed to some two weeks or so, before much pressure is added.

The method of making the pipe is quite simple and cheap. Mr. H. states, that in his own town, as well as in Rockbridge, it has been extensively used for several years, and is very highly esteemed. He has seen several instances where water is conveyed from half a mile to a mile, with a heavy pressure.—*American Agriculturist*.

Horticulture.

FRUIT CATOLOGUE OF THE AMERICAN POMOLOGICAL SOCIETY.

For general Cultivation.—Apples.—American Summer Pearmain, Autumn Bough, Baldwin, Benois, Bullock's Pippin, Carolina June, Danver's Winter Sweet, Early Harvest, Early Strawberry. Fall Pippin, Fameuse, Gravenstein, Hawley, High Top Sweeting, Hubbartson Nonesuch, Jonathan, Lady Apple, Ladies' Sweett, Large Yellow Bough, Melon, Minister, Monmouth, Pippin, Porter, Primate, Rambo, Red Astrachan, Rhode Island Greening, Roxburry Russett, Smith's Cider, Summer Rose, Swaar, Vandervere, Waggener, William's Favorite (except for light soils,) Wine Apple or Hays, Winesap.

Pears.—Ananas d'Été, Andrews, Bartlett, Belle Lucrative, Beurre d'Anjou, Beurre d'Aremberg, Beurre Diel, Beurre Bose, Beurre St. Nicholas, Beurre Clairgeau, Beurre Giffare, Beurre Superfin, Brandywine, Bloodgood, Buffum, Cabot, Dearborn's Seedling, Doyennne d'Ete, Doyenne Boussock, Doyenne d'Alencon, Flemish Beauty, Bulton, Golden Beurre of Bilboa, Kingsessing, Howell, Lawrence, Louise Bonne de Jersey, Madeline, Manning's Elizabeth, Onondaga, Osband's Summer, Paradis d'Automne, Rostiezer, Seckel-Shelden, St. Michel Archange, Tyson, Urbaniste, Vicar of Wakefield, Winter Nalis, Uvedale's St. Germain (for baking.)

For cultivation on Quince Stock.—Pears.—Beurre Superfin, Beurre Hardy, Buffum, Belle Lucrative, Belle Reine Lumas, Beurre d'Amadis, Beurre d'Anjou, Beurre Diel, Beurre Langelier, Catillac, Duchesse d'Angouleme, Doyenne d'Alencon, Easter Beurre, Figue d'Alencon, Clos Marceau, Louise Bonne de Jersey, Napoleon, Nouveau Poito, Rostiezer, Soldat Laboureur, St. Michel Archange, Urbaniste, Uvedale's St. Germain (for baking,) Vicar of Wakefield, White Doyenne.

PLUMS.—Bleeker's Gage, Coe's Golden Drop, Green Gage, Jefferson, Lawrence's Favorite, Lombard, Monroe, Purple Favorite, Prince's Yellow Gage Purple Gage, Reine Claude de Savoy, Smith's Orleans, Washington, McLaughlin.

CHERRIES.—Belle d'Orleans, Belle Magnifique, Black Eagle, Black Tartarian, Coe's Transparent, Downer's Lake, Early Purple Guigne, Governor Wood, Elton, Early Richmond (for cooking,) Grafton or Bigarreau, Knight's Early Black, May Duke, Reine Hortense.

APRICOTS.—Breda, Large Early, Moorpark.

NECTARINES.—Downton, Early Violet Elridge.

PEACHES.—Bergen's Yellow, Crawford's Early, Coolidge's Favorite, Crawford's Late, Early York (serrated,) George the fourth, Grosse Mignonne, Morris White, Early York (large,) Hill's Chili, Large White Cling, Madeleine de Courson, Teton de Venus, Old Mixon Free, Old Mixon Cling.

GRAPES.—*Under Glass.*—Black Damascus, Black Hamburg, Black Frontignan, Black Prince, Chasselas de Fontainebleau, Red Chasselas, Cannon Hall Muscat, Grissly Frontignan, White Frontignan, White Muscat of Alexandria, White Nice, West's St. Peter, Zinfindul.

Open Culture.— Catawba, Concord, Delaware, Diana, Isabella.

RASPBERRIES.—Falstaff, Franconia, French, Knevet's Giant, Orange, Red, Antwerp, Yellow Antwerp.

STRAWBERRIES.—Boston Pine, Hovey's Seedling, Burr's New Pine, Longworth's Prolific, Large Early Scarlet, Hooker's Seedling, Wilson's Seedling.

CURRANTS.—Black Naples, May's Victoria, Red Dutch, White Dutch, White Grape.

GOOSEBERRIES.—Crown Bob, Early Sulphur, Green Gage, Green Walnut, Houghton's Seedling, Ironmonger, Laurel, Red Champagne, Warrington, Woodward's White Smith.

BLACKBERRIES.—Lawton's New Rochelle, Dorchester Blackberry.

THE FLOWER GARDEN.

PREPARE TO BED-OUT.—For many weeks the attentive flower gardener has been heaping up his green-house shelves with delicate, soft-wooded plants in little pots, whose destination, when the genial warmth of May begins to be felt, is the flower border and beds. As soon as they can be risked from under the nursing of the glass, they will be consigned to their summer quarters, much to the gratification of all, and the relief of some. Verbenas, Petunias, Heliotropes, Salvias, Gaillardias and Phloxes, are among the more familiar favorites, to all of which families new additions have been made since the last flower season. Though it is rather soon to sound the alarm for the novelties of 1859, yet a hint to be on the look out may be excusable.

PETUNIAS.—We are encouraged to hope that a few of the boasted double Petunias, may be more generally displayed the coming season. Much has been said of their attractions ; hitherto they have been sparely distributed. The IMPERIALIS, (double white,) has enjoyed its brief season of popularity. We want something more decided to be popular. "Dr. Lindley" is said to be a decided acquisition. The beautifully striped and mottled single Petunias, have been very attractive, and with a few high colored double varieties, a great improvement will be secured.

VERBENAS.—As the list of Verbenas is almost interminable, we may as well commence in time. A few novelties every week, will be more acceptable than to monopolize the entire space for several weeks. ATTRACTION is one of the late acquisitions—a good colour with a distinct eye. *Emperor*—a very large truss; novel color. *Lady Albina Foster*, very distinct and peculiar. As well as we could judge from the flowers of these three sorts, they will become very popular. Among those noted last season, *Rosy Gem*, a bright rose color, is still a favorite. Also *Sir Joseph Paxton*, a shaded purple, and *Prince Edward*, a dark purple. Several new scarlets are on the list for promotion.

HELIOTROPE.—*Beauty* is a great improvement on the many varieties already in cultivation. The habit of the plant is vigourous, and the truss very large, and of a rich dark blue.

SUMMER FLOWERING BULBS.—The garden, during the summer, is greatly enriched by showy GLADIOLUS or Sweet Flag, of which we can now boast an endless variety. Upwards of fifty choice sorts are in cultivation, varying from purple and white to scarlet and crimson, with spots and workings. They are easy of cultivation, much more so than spring blooming bulbs ; they require an open, sandy loam, rich and deep, and full exposure to the sun. The bulbs, which are more properly termed *corms*, as the crocus, are kept in a dry place, during winter, on a shelf in the cellar, or, as a correspondent recommended, "hanging up in the cellar." Plant them out in the latter part of April or beginning of May, and take them up again before frost.

The TIDIGRIAS, or Tiger Flower, require somewhat similar treatment ; they are, however, more delicate bulbs than the Gladiolus, being *bulbs*, truly so called. Nothing in the way of a flower can be more gaudy than the TIGRIDIA PAVONIA or red Tiger flower.

The TUBEROSE (Polianthes) is so well known that we need scarcely say a word in its behalf, only to remind its friends that its season is approaching,

---

ANNUAL FLOWERS.—There is a great number of flower seeds offered for sale by the seedsmen in our large cities, but there are really very few which are very desirable. although in large gardens it is well to have variety as well as quality. For small gardens the number can be easily reduced to a dozen.

For growing in masses, or in beds by themselves, we consider the Portulacca eminently beautiful and deserving. There are about six distinct colors, and although the flowers are only open during the sunshine, yet from the brilliancy of their colors, the closeness of its growth, (completely covering the ground,) and the fact that it blooms from July until frost comes, we deem it well worthy of cultivation. It is not necessary to sow the seed yearly, as plants come up in the spring in great profusion, from self-sown seeds.

The Phlox Drummondii is *the* most beautiful annual grown. This should also be planted in masses ; and nothing can exceed the beauty of a bed composed exclusively of this plant, as there is every shade of color from white to crimson.

The double Paris Balsams are very beautiful, not ressembling, and infinitely superior to, the single balsams, commonly known as "lady slippers." These should be planted in groups of three or four plants, about 12 inches apart.

The German double Dwarf Asters, are remarkably beautiful. These look best planted in groups of five or six.

The Rockett Larkspur, planted in rows in the spring, will flower handsomely in June or July, but do much better if sown in September, and the young plants covered lightly with straw or leaves during the winter.

But we must content ourselves with making a brief list of a few other annuals well worth cultivating. Four o'clocks, German Zinnias, Coreopsis, and the improved varieties of Marigolds, are large plants, and desirable in a large garden.

Candytuft, Sweet Aiyssum and Mignonette, should be found in every garden.

The spotted Love Grove is a modest and beautiful little plant. The Eschscholtzia is a free blooming and very pretty annual.

One great mistake in planting flower seeds is, that they are planted too early. For this latitude we have found less disappointment in putting in seeds from the 15th of May to the 1st of June, than by earlier planting. In our next we will treat of biennials. G. B. H.

A BEAUTIFUL CLIMBER.—No one who has a place for climbing plants, should be without the beautiful and fragrant "Clematis flamula." It is a rapid grower, making 15 or 20 feet in a season. The foliage is delicate, and the flowers, which are produced in profusion for three months, are of a pure white and delightfully fragrant. I do not know a more desirable vine for a partial screen for a window or a piazza. It can be trained to strings or wires without any trouble, as it throws out delicate tendrils from the base of the leaves, which cling to the nearest object. G. B. H.

Ladies Department.

RAISING CHICORY IN THIS COUNTRY.—In our February issue, we described chicory and its use as a substitute for, and an adulteration in coffee. Large quantities of prepared chicory are annually imported into this country, but we were not aware until recently that any attempt had been made to grow the plant here. We have before us the card of "Floto & Reinhard : Chicory Manufactory," Williamsburg, L. I., and on February 15th these gentlemen called together a company of farmers at Flushing, to listen to some remarks by Mr. Ronge, on the value of Chicory as a farm product, and to receive proposals for growing it on contract. We attended the meeting and heard the remarks and proposals. It was stated that in Newton, and elsewhere, several persons last season tried small plots with favorable results ; that the product per acre was quite as large as that of carrots on similar soil, and with very similar culture ; that the roots were sweeter, more aromatic, and better than the imported, and that the crop would be highly remunerative. They proposed to deliver to farmers necessary seed, charging the cost of transportation (or $1 per lb) and contract to pay $20 per ton (1 cent per lb) for all roots delivered at their factory in the months of September and October, the roots to be cleaned by washing them, and none to be taken weighing less than 2 ounces each. The agreed price of the seed to be deducted from the returns for the roots.

The terms proposed appear to be fair, and we presume some farmers will be induced to make the trial of an acre or so. It was recommended to use about four pounds of seed to the acre, to sow about the middle of April and to cultivate in all respects like carrots. Specific printed directions are to be furnished to those who take the seed. This will be wholly an experiment, as it is yet to be determined whether this plant will flourish well, one year with another, and whether its quality will enable it to compete with that imported. It is cultivated somewhat largely in England, in the Counties of Surrey, Bedford and York, but that grown there is of inferior market value to that imported from Prussia, Belgium and France, where it is a staple crop in some localities. If the experiments of the coming season, which we shall watch with some interest, shall prove successful, its culture here will be rapidly extended, though this must be mainly confined to the vicinity of manufactories, as the roots cannot be transported to great distances. For the reasons stated in our former article, we should deprecate its culture and extended use ; though it is no worse than tobacco, and if to be used, as is already largely done, we may as well produce it here as to import it, provided we can do so advantageously. We shall probably try a small plot this year as an experiment, and if so, report the result.—*American Agriculturist*.

RECEIPTS FOR MAKING GOOSEBERRY WINE AND SPRUCE BEER.—"A Lady" writes—" 1. Please let me have a receipt for making green gooseberry wine. 2. Also another for making spruce beer."—1. Have ready a tub that will hold 15 to 20 gallons ; for every gallon take 5 lbs. green gooseberries, bruise them well, put into the tub, and add 4 to 5 gallons cold spring water ; mix and mash the whole well together, cover the tub, and let it stand for 24 hours, strain through a coarse canvas bag, and squeeze the fruit quite dry ; pour a gallon of water on the solid matter, mash it up, and strain so as to get any soluble matter that may remain, and add it to the liquor in the tub; put into a tub 30 lbs. loaf sugar, pour the liquor on it, and add as much water as will make the whole to about 10½ gallons, and mix till the sugar is dissolved ; put into a cask, which should be kept full to the bunghole, and inclined a little to one side to let the scum run off: about half a gallon of liquor should be kept for this purpose. When done working, the bung may be fastened down, and a small hole made at one side into which a peg must be put, which should be drawn out every day or two to let the fixed air escape. When all fermentation is over drive the peg in tight. In six or seven months it may be drawn off into a fresh vessel, and let stand about three months before bottling. 2. Put in a barrel or other vessel 8 gallons of cold water, to which add 8 gallons of boiling water, 16 oz. molasses, and 4 to 6 tablespoonfuls of the essence of spruce (to be had at the druggists), and stir the whole well together, then add half a pint of yeast, keep in a temperate place, with the bunghole open, for two days, till the fermentation be abated, when it may be closed up or bottled. This query, with many others, from want of space, was pressed out last week, which, we hope, will be sufficient apology to our fair correspondents for its non-appearance.

MONTHLY METEOROLOGICAL REPORT FOR FEBRUARY 1859.

FROM OBSERVATIONS TAKEN AT ST. MARTIN, ILE JESUS, C. E., LATITUDE 45 DEGREES 32 MINUTES, NORTH LONGITUDE, 73 DEGREES, 36 MINUTES WEST, HEIGHT ABOVE THE LEVEL OF THE SEA 118 FEET.

BY CHS. SMALLWOOD, M. D. L. L. D.

BAROMETER.

	Inches.
Highest reading of the barometer the 11th day	30.460
Lowest reading of the barrometer the 20th day	28.072
Monthly mean	29.057
Range	1.978

THERMOMETER.

Highest reading the 20th day	F. 40.1
Lowest reading the 13th day below zero	23° 6
Monthly mean	15° 62
Range	66° 7
Greatest intensity of the suns rays	58° 7
Lowest point of terrestrial radiation below zero	23° 9
Mean of humidity	776

Rain fell on 2 days, amounting to 0,512 inches, it was raining 9 hours 15 minutes and was accompanied by thunder on the 20th day.......

Snow fell in 10 days, amounting to 23, 58 inches itwas snowing 92 hours 45 minutes....................

Most prevalent wind N. E. by E...

Least prevalent wind N..........

Most windy day the 21st, mean miles per hour.................28 14

Least do.do, the 32nd day 0 00.

Aurora borealis visible on 5 nights

Lunar Pole visible on 2 nights.....

Zodiacal Light visible..........

The electrical state of the atmosphere has indicated moderate intensity.

Ozone was in moderate quantity..

MONTREAL RETAIL MARKETS.

TUESDAY, May 31st 1859.

	BONSECOURS.					ST. ANN'S.				
FLOUR.	s.	d.		s.	d.	s.	d.		s.	d.
Country Flour, per quintal	18	9	a	19	0	0	0	a	0	0
Oatmeal. per quintal	17	9	a	18	0	0	0	a	0	0
ndian Meal, per quintal	0	0	a	0	0	0	0	a	0	0
GRAIN.										
Wheat, per minot	0	0	a	0	0	0	0	a	0	0
Oats, per minot	2	9	a	3	0	2	3	a	2	6
Barley, per minot	3	9	a	4	0	0	0	a	0	0
Pease, per minot	4	3	a	4	6	0	0	a	0	0
Buckwheat, per minot	3	6	a	3	9	0	0	a	0	0
Indian Corn, yellow	4	6	a	5	0	0	0	a	0	0
Rye, per minot	0	0	a	0	0	0	0	a	0	0
Flax Seed, per minot	7	0	a	7	3	0	0	a	0	0
Timothy, per minot	9	0	a	9	6	0	0	a	0	0
FOWLS AND GAME.										
Turkeys, (old) per couple	5	0	a	7	6	10	0	a	12	0
Turkeys, (young) per couple	0	0	a	0	0	6	0	a	8	0
Geese, (young) per couple	4	0	a	6	0	3	6	a	4	6
Ducks, per couple	2	6	a	4	0	2	6	a	3	0
Ducks, (wild) per couple	3	0	a	3	6	0	0	a	2	6
Fowls, per couple	2	6	a	3	0	2	0	a	3	0
Chickens, per couple	0	0	a	0	0	1	3	a	1	6
Pigeons, (tame) per couple	1	0	a	1	3	0	0	a	0	0
Pigeons, (wild) per dozen	2	6	a	3	0	3	6	a	4	0
Partridges, per couple	0	0	a	0	0	0	0	a	0	0
Woodcock, per brace	0	0	a	0	0	0	0	a	0	0
Hares, per couple	0	0	a	0	0	0	0	a	0	0
MEATS.										
Beef, per lb	0	4	a	0	9	0	4	a	0	8
Pork, per lb	0	5	a	0	7	0	6	a	0	6½
Mutton, per quarter	5	0	a	7	0	7	0	a	12	0
Lamb, per quarter	3	6	a	0	0	2	0	a	3	9
Veal, per quarter	5	0	a	12	3	5	0	a	15	0
Beef, per 100 lbs	35	0	a	40	0	30	0	a	40	0
Pork, (fresh) per 100 lbs	35	0	a	45	0	27	6	a	30	0
DAIRY PRODUCE.										
Butter, (fresh) per lb	1	3	a	1	6	0	11	a	1	0
Butter, (salt) per lb	0	11	a	1	0	0	8	a	0	9
Cheese, per lb, skim milk	0	0	a	0	0	0	0	a	0	0
Cheese, per lb, sweet do	0	0	a	0	0	0	0	a	0	0
VEGETABLES.										
Beans, (American,) per minot	0	0	a	0	0	0	0	a	0	0
Beans, (Canadian) per minot	7	6	a	10	0	0	0	a	0	0
Potatoes, (new) per bag	4	0	a	4	9	4	0	a	5	0
Turnips, per bag	0	0	a	0	0	0	0	a	0	0
Onions, per bushel	0	0	a	0	0	0	0	a	0	0
SUGAR AND HONEY.										
Sugar, Maple, per lb, (new)	0	4½	a	0	5	0	4	a	0	4½
Maple Syrup per gallon	0	0	a	0	0	0	7½	a	0	8
MISCELLANEOUS.										
Lard, per lb.	0	8	a	0	9	0	8	a	0	9
Eggs, per dozen	0	8	a	0	9	0	8	a	0	9
Halibut, per lb.	0	0	a	0	0	0	0	a	0	0
Haddock, per lb	0	3	a	0	0	0	0	a	0	0
Apples, per barrel	25	0	a	30	0	15	0	a	20	0
Oranges, per box	20	0	a	22	6	0	0	a	0	0
Hides, per 100 lbs	0	0	a	0	0	0	0	a	0	0
Tallow, per lb	0	4½	a	0	5	0	0	a	0	0
BREAD.										
Brown Loaf	0	11	a	0	0	0	9	a	1	0
White Loaf	0	0	a	0	0	0	9	a	0	