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AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 5. MONTREAL, FEBRUARY, 1852. No. 2.

It would be a great advantage to agriculturalists if they were to meet together more frequently, and have regular discussions on particular subjects connected with agriculture, as they have in Britain, and in the neighboring state of New-York. The Royal English Agricultural Society, the London Farmer's Club, the Highland and Agricultural Society of Scotland, and many Local Societies, have regular discussions on various branches of husbandry, that are productive of the greatest benefit to agriculturalists. When a subject is discussed, there is generally a resolution adopted as to what conclusion the meeting have come to on the question before them, and this will, of course, be a great encouragement for farmers to adopt the plans recommended. The discussion shows upon what grounds the meeting have passed the resolution, so that farmers will be able to judge for themselves the probable advantage of the course recommended. These discussions are also connected with Exhibitions, Cattle Shows, Premiums for well-managed farms, &c., &c., but for this country at the present moment, we should give the preference to the discussions, provided they were published, as the best means of general instruction. The subjects might be: The general management of a farm. The various rotations best suited to soils, and particular localities. The making and management of manure. The cultivation of any particular crop, from the first preparation of the land, until it is harvested. The selection and management of horses, ditto of neat cattle, ditto of sheep, ditto of swine, ditto of poultry. The dairy and its management. There are some other subjects that might be added to the foregoing enumeration, such as the best modes of draining, ploughing, summer fallow, management of meadows and pasture lands, preserving and planting trees, orchards, &c. We beg to say that however superior individual knowledge and experience may be on these subjects, it would be a great advantage, that the best modes, and most successful practice should be made more generally known as they would by these discussions. All who are engaged in husbandry are not good farmers, and there is no better mode of instructing them, than by publishing the discussions, and the conclusions arrived at at these agricultural meetings. The publication of an agricultural periodical that is well conducted, and carefully excludes every subject that would give offence to political parties, or show any bias upon any party questions, is calculated to produce the greatest benefit to agriculture, by the general circulation of useful information on farming. When the periodical comes regularly to the farmer and he reads and studies the information and suggestions submitted to him, he cannot fail to try some of the experiments proposed to him, if they are brought before him in a proper way. Whatever prejudice may exist against "Book Farming," reason and truth will prevail sooner or later, and we know that prejudice has given way in very many instances. It acts very prejudicial to the character of agricultural publications, if any glaring mistakes should appear in them occasionally, as this will at once put an end to confidence in their information or sugges-

tions, and it is these mistakes that has produced such distrust in "Book Farming."

AGRICULTURAL CLASS BOOK.

Q. What do farmers understand by the word earth?

A. The soil we till.

Q. Of what is this soil composed?

A. Of different earths, of which the chief are alumina, silica, lime, and magnesia. There are also minerals (of which iron is the most common) and what are called *alkalies* found in it, besides the decayed remains of plants and animals.

Q. What is alumina?

A. A pure clay; it is named alumina, because it forms the principal part of alum. It is generally combined with other earths, of which silex is the most frequent. It is also combined with a great deal of water. From such clay as this, pottery ware, bricks, &c., are made.

Q. What is silica?

A. In its pure state it is flint stone, sand, or fine gravel. It is abundant in some form in all soils. It cannot be dissolved by water. From silica, together with either of the alkalies, soda, or potash, in certain proportions, glass is made. The silica and alkalies are heated and run together into one mass, which is called glass.

Q. What is lime?

A. The substance of marble, limestone rock, chalk, and gypsum. It also forms a great part of marl, and of shells and bones of animals. When naturally mixed with the soil it is in the form of gravel, or a kind of sand, but not quite so loose as sand. It is slightly soluble in water.

Q. What do you mean by soluble?

A. Capable of being dissolved or melted.

Q. What is magnesia?

A. An earth resembling lime, but neither found in such large quantities, nor so often. It is sometimes found with lime, which is then called magnesian lime.

Q. What is the name given to the dark-colored substance formed of the remains of decayed plants and animals?

A. Humus, or vegetable mould: it contains all the principal food of plants in the most perfect state for their immediate use.

Q. Where is it found most abundantly?

A. In old garden soil, burial grounds, old dung-hills, and hedges.

Q. What is meant by the word alkali?

A. It is an Arabian word, which means the ashes of sea plants which have a saltish and bourish taste. The word alkali is now applied as a name for potash, soda, and ammonia, which are very abundant in the soil, and form a greater or less part of the food of all plants.

Q. What is potash?

A. It is a powdery substance of a light gray color, and most easily obtained from wood ashes, or the ashes of any land vegetables. It is seldom found pure, but for the farmer's purpose it may be considered as being so.

Q. What is soda?

A. A substance similar to potash: it is solid, and white, and, like potash, seldom, or never found pure, that is, by itself alone, but in combination with something else. It is chiefly obtained from bay and rock salts, and by burning sea-weed, in which it exists in large quantities. Bay salt is that which is made from sea water, and rock salt is that which is found under ground. Like potash and its compounds, soda and its compounds are found generally in all soils in greater or less degree.

Q. What is ammonia?

A. It is a gas which (being without color) cannot be seen; but we are made sensible of its presence by its smell, which resembles that of hartshorn. It is neither found so often nor in such large quantities as potash and soda. It is given out from decaying animals and vegetables, and also from the urine of animals. It is seldom found except in combination with other substances.

Q. Are all soils alike?

A. No; they differ much in their qualities.

Q. Tell me some of the different kinds of soils, and the names by which they are known?

A. The chief are, sandy, gravelly, clayey, loamy, peaty, and alluvial soils.

Q. What is a sandy soil?

A. A sandy soil is one in which sand, or silex, is in a greater quantity than other earths; and thus the sand marks or gives character to the soil. Sandy soils are mostly poor and barren; water runs too quickly through them. A sandy soil is also called a light soil.

Q. What is a gravelly soil?

A. It consists chiefly of small stones; and unless the gravel be limestone, it is a very poor, hungry, light soil; and, like a sandy soil, it parts too quickly with water.

Q. What is a clay soil?

A. A close hard soil, in which alumina is in the greatest proportion. From the great affinity or liking which alumina has for water, a clay or aluminous soil takes in and holds a great deal of water.

Q. What is a calcareous soil?

A. One in which lime, in the form of limestone, limestone gravel, chalk, marl, or shells, forms the chief ingredient.

Q. What is a loamy soil?

A. A mellow soil, not so stiff and greasy as a clay, but closer than a sandy soil. A loamy soil is naturally very good. There are varieties of loams, but they all contain lime, more or less.

Q. What causes the varieties of loams?

A. The different proportions of sand, and lime, and clay: according to their proportions, loams are light, heavy, middling, or calcareous.

Q. What is a peat, or bog soil?

A. One composed of the remains of the roots, and other parts of trees, grasses, and other plants in a partly decomposed state. This, in its natural condition, is the most unproductive of all soils.

Q. What do you mean by a partly decomposed state?

A. Partly rotted or decayed.

Q. Why is an unreclaimed peat soil so unproductive?

A. Because the substances of which it is formed, while they are in a partly decomposed state, are not able to nourish the better order of plants.

Q. How does this arise?

A. The great quantity of water which all bogs contain, prevents the process of decomposition from being completed.

Q. Does this entirely depend upon the presence of water?

A. Chiefly so; for the water prevents the air, which is necessary to rot or decompose any thing, from having its effect; and bog water contains an acid called *tannic*, which preserves vegetables from decaying. For instance, there are found in bogs sound pieces of trees, unrusted metals, and even the bodies of animals in a perfect state, which is owing to the effects of tannic and other acids and the want of air.

Q. What is an alluvial soil?

A. An alluvial soil is that of which the banks of rivers are mostly composed: it is brought by the sea, and deposited, or lodged, by rivers in their course, and by floods. It is the richest of all soils, when deep and dry, and owes much of its goodness to its having been thoroughly mixed by the action of water.

Q. What is the subsoil or undersoil?

A. The soil which is under that which we till.

Q. Is the subsoil everywhere the same?

A. No; there are varieties of subsoils. Some subsoils are of such stiff, hard, and close clay, that they will not let water pass through them; and others are gravelly or sandy: sometimes the undersoil is a rock.

Q. Does the quality of the subsoil affect that of the upper soil in any way?

A. Yes; the fertility of the upper soil depends in a great measure on the nature of the undersoil.

Q. Mention some instances?

A. A subsoil of limestone gravel makes the upper soil of greater value, because water does not rest upon it, and the gravel underneath can be mixed with the surface soil at will. Besides, the roots of plants can strike down into such subsoil, in which they will find moisture and food. A subsoil of hard clay is the worst, because water rests there as it would on an earthen plate. When the undersoil is rock, the upper is generally poor, dry, hungry, and easily exhausted.

Q. What is the use of the soil?

A. To give food and fixity to plants.

Q. What is a plant?

A. A thing that grows in the ground, and has roots, stems, and leaves, possessing life, and living by nourishment.

Q. What is the use of the roots?

A. To give the plant a firm hold in the earth, and to take up moisture, gases, and very small particles of earth, which they distribute through the body of the plant.

Q. What is the use of the stem?

A. To support the different parts of the plant. It is through the stem also, by means of a great number of tubes in it, that the sap (that is, the liquid food which the roots have taken up) is conducted to all parts of the plant, the branches, leaves, &c.

Q. What is the uses of the leaves?

A. The leaves are to a plant what lungs and stomach are to animals; that is to say, they take in and give out air, they breathe as animals do, and they digest the food taken up by the roots.

Q. How is it, then, that the leaves of so many plants die in winter?

A. Because the plant is then in a motionless state, resembling death. The sap ceases to rise, and the appointed office of the leaves is at an end; but when the sap recommences to rise in the spring, leaves appear again to perform their wonted duty.

THE HOME-FARM OF MR. THORNHILL, OF STANTON, NEAR BAKEWELL.

On this farm great improvements have been effected, and, as they illustrate the advantage of such improvements, and show by contrast how much may yet be done by well-directed enterprise to increase the produce of our fields and the employment of our laborers, we shall describe them somewhat in detail. The farm extends to 400 acres, 200 of which are grass and 200 arable. Mr. Thornhill took it into his own hands in 1840. The farm then kept 16 cows, producing 2¼ cwt. each. There were about six young cattle sold off the farm annually, and 50 to 60 sheep. Four farm horses were employed in working it, and, besides an annual produce of 60 quarters of oats, there might be once in three years or so a field of five or six acres of the best land in wheat, which, after a clean summer fallow, yielded 27 bushels an acre. Such was the whole produce of the farm in stock and corn. It now maintains a regular stock of 43 milch cows, 30 of the produce of which are sold fat every year at three-years-old. Each cow, besides rearing the calves, produces equal to 4 cwt. of new milk cheese. 200 sheep, old and young, are now kept on the farm, and £160 worth of pigs were last year sold off it. The average yield of wheat is now 40 bushels an acre, and of oats 60 bushels.

The land lies on the gritstone, and is all on a considerable slope, the lowest part being 220 feet above sea level, from which it rises over the top of the hill to an elevation of 900 feet. It is well sheltered by plantations and good stone walls, and the fields have been laid out in convenient enclosures. The soil is dry and friable, and the field operations can be conducted without impediment. To render it so a very large

expenditure has been incurred, the land having been full of great blocks of stones, all of which have been removed, either by being broken and placed in drains, or by being carried bodily from the field, or by breaking them to pieces, and then covering them with trenched earth to a depth beyond the reach of the plough. This latter operation is at present being carried into effect on a corner of a field for the purpose of making the fence straight. The ground is literally paved with huge blocks of gritstone, which are blown to pieces by gunpowder, or split by wedges, and then, after being spread along the face of a trench, are covered to a considerable depth by fine friable soil, got by the workmen in great abundance under the bed of the different massive blocks as they are removed. The cost of this operation is £50 an acre, and can only be justified on the score of convenience in laying out the adjoining better land. But the reclamation of the whole farm has been an expensive operation, 200 acres of it having cost £15 an acre for drainage, trenching, and fences.

The arable land is managed on the four-course system, with this peculiarity, that on the upper land oats are the only corn crop taken, and on the lower and richer land wheat only. On the upper land the turnips and clover are both eaten on the land, the sheep getting also cake or corn. On the lower land the turnips draw for consumption in the stalls, and the clover is cut for soiling or for hay. The general style of management is as follows:—1st, the "seeds," which are a mixture of 14 lbs. of red clover and 2 pecks of Italian ryegrass per acre, are watered with liquid manure from the tank in April. The first cut is made into hay, and the ground is then watered a second time with the best effect. The second cut is given to the horses, and to the cows when the grass on the pastures begins to fail, in August, at which time the gritstone land gives way, and the cows fall off in produce a-half cwt. of cheese as compared with those fed on limestone land. The cut grass more than counterbalances this natural defect of the soil, the increase of produce in consequence of this additional food being from a ½ to 1 cwt. of cheese each. The whole of this land is ploughed up for wheat in October, the worst of it being first dressed with 10 tons of farm-yard dung per acre. The land is then sown with (second) wheat, 8 to 10 pecks of Spalding's Prolific being drilled across it, in rows of 7 to 8 inches apart. The wheat crop is never hoed. Last year the average yield was 48 bushels an acre. When the crop has been harvested the stubble is gone over by men with forks, who fork out all the twitch. This, after being exposed to the weather, is gathered into heaps and mixed with lime. The land is then ploughed and prepared in spring for (third) Swedes, mangel, and yellow bullock turnips. The Swedes are sown in the end of May, 20 tons of dung being previously spread in the ridges. The crop averages 20 tons. It is in all cases drawn in autumn and pitted. The other green crops are treated in the same way. On the most distant and elevated fields 16 bushels of bones and 1 cwt. of guano per acre are used without dung, which cannot be conveniently taken so far; but the crop is there consumed on the field by sheep, the turnips having been previously taken up and pitted in little heaps, to preserve them from frost or other injury. The turnips are taken out of the little pits as required, and given, cut to the sheep in troughs, with ½ lb. to 1 lb. of cake each daily. The green crop is followed by wheat on the best land, by oats on the inferior land.

The cattle being all fed in stalls, and the buildings spouted to carry off rain water, a large quantity of liquid manure is collected in an underground tank, which is found most valuable as an application to young grass. The dairy produce chiefly consists of cheese, which weigh from 27 lbs. to 30 lbs. each. They are colored, and salted by being placed in brine in a trough for two days. The calves are fed for the first fortnight on four quarts of new milk a-day each, for the second fortnight on six quarts, and after that on scalded whey and 1 lb. of oilcake, steeped over night in boiling water and hay tea.

The accounts on this farm are kept minutely and accurately, and for last year they show a charge in addition to the old rent of 7 per cent. interest on expenditure on buildings, 5 per cent. on other permanent improvements, 10 per cent. on implements, 10 per cent. on live stock, amounting altogether to £885 against the farm for rent and interest of capital. After deducting an abatement of 10 per cent. on the rent for "present prices," and adding the usual expenses of cultivation, the produce of the farm in stock and crop last year leave a balance over to the credit of the farm. Mr. Thornhill has, therefore, the satisfaction of having furnished remunerative employment to a large extent by his enterprise, besides ameliorating the face of the country and engaging himself in an occupation most useful to the neighborhood, and which not only does not interfere with, but adds zest and interest to the other occupations of a resident landlord.

The Journal of Agriculture and Transactions of the Highland and Agricultural Society of Scotland. William Blackwood and Sons, Edinburgh and London.

Dr. Voelcker, in the present number, contributes an able and well-digested paper "*On the Effects of Burnt Clay as a Manure,*" and gives some carefully managed experiments in confirmation of his views on the subject and concludes by recapitulating the principal and most practical facts, as follows:—

1. The mechanical changes produced on clay upon burning, which by no means are unimportant, nevertheless do not sufficiently explain the fertilizing effects of burnt clay.

2. These are dependent upon the chemical, as well as on the mechanical changes, both produced upon burning clay.

3. Clay after burning becomes more soluble in dilute acids.

4. The temperature used in burning clay regulates the solubility of clay; too intense a heat renders clay, again, less soluble.

5. A temperature whereby the organic matter in clay soils is merely changed, but not destroyed altogether, should be employed in burning clay in the field.

6. On overburning clay becomes less soluble than it is in its natural state.

7. Burnt clay contains more soluble potash and soda than unburnt.

8. Properly burnt clay furnishes a larger proportion of soluble potash and soda than clay burnt at too high a temperature.

9. In burning clay the same effects are produced as in bare-fallow.

10. The fertilizing effects of burnt clay are mainly dependent on the larger amount of potash and soda, particularly of potash, which is liberated from the insoluble silicates in the process of burning.

11. Clays originally containing much undecomposed silicates of potash and soda are best suited for burning.

12. On the contrary, those resembling in composition pure pipe and porcelain clays, and all those which contain mere traces of undecomposed alkaline silicates, are unfit for burning.

13. It is desirable that clay which is intended to be burnt should contain lime.

14. The application of quicklime to newly burnt clay land, or the mixing of clay with lime before burning, is likely to be attended with much benefit.

15. Burnt clay absorbs ammonia from the atmosphere.

16. Clay in its natural state furnishes more ammonia than properly burnt clay.

17. Overburnt clay does not absorb so much ammonia as properly burnt clay.

18. The cause of the failures attending overburning clay are due:—

1. To the mechanical changes which clay experiences in overburning, whereby it is rendered hard like stone.

2. To the chemical changes whereby the constituents of clay are rendered less soluble.

3. To the diminished porosity, and consequently reduced absorbtive power of such clays.

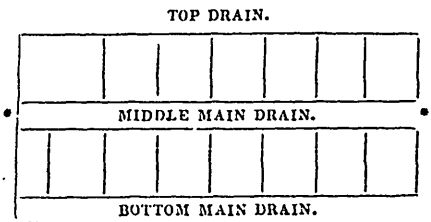
19. Burnt clay improves especially turnips, carrots, potatoes, and other green crops, because it furnishes potash, which these crops largely require, more abundantly and more readily than unburnt clay.

A strong character should never have the complete control of a weak one; the weak cannot sympathize with the strong, and; to conceal his weakness, enters into a series of deception that often end fatally for the weak.

CHIPPENHAM HUNDRED FARMERS' CLUB

ON DRAINAGE.

In fields of uniform texture, the ordinary drains should run parallel to one another, at equal depths and distances, and at right angles to the bottom or main drain; in other cases the judgment of the drainer must regulate their position. The top ends of the drains should always be deeper than the lower ends, if the fall will admit of it, as it is there the water generally rises—and they should all be joined into a top drain, to admit of a circulation of air to dry the head ridge, and intercept springs. An outlet should be given for every *five acres*, and if the run of the field be too long, the drains can be cut off in the middle, and the water sent down by a main drain thus:



In addition to the general advantages which I have already stated as resulting from drainage, I shall shortly state the actual results of some of the drainage operations which I conducted in Cheshire, between the years 1841 and 1842, and for which I twice obtained the drainage medal of the Manchester and Liverpool Agricultural Society.

The first case which I shall adduce is a fair average of the others. It is a *thirteen acre* field, of stiff, brown loam, resting on tenacious blue clay and marl, and had been let at 17s. 6d. per acre; it was drained early in 1842, with 2½ inch tiles and soles, laid 3 feet deep and 22 feet apart; it cost—

Labor	£24	1	4
23,000 tiles and soles.	40	10	0
	£64	11	4, or nearly £5 per acre.

It had previously been cropped as follows, without manure:—in 1838, wheat; 1839, oats; 1840, bare fallow; and 1841, wheat. After drainage it was deeply ploughed and worked by Finlayson's grubber, and sown with Swedish turnips, manured with 160 cubic yards of good, well-rotted cow-dung, 4 cwt. of guano, and two tons boiled bones. The produce averaged 30 tons per acre, and some of the bulbs weighed 17½ lbs. They were all pulled and consumed by cattle in the house. The next crop was wheat, sown on the 7th March, producing 290 bushels, equal to *twenty-three* bushels per acre. It was sown down with permanent grass seeds, and let for grazing with ewes and lambs, at £30, or 46s. per acre. The party who paid this rent, having sold all his stock, and made a fair profit, obtained

permission to sub-let the field from the 6th October to the 6th December, and obtained for these two months a rent of £10, which was nearly equal to the previous tenant's annual rent. In this case the rent to the landlord was nearly three times its former amount, and the tenant's profit probably greater at that rent than his predecessor's at 17s. 6d. per acre. The original annual value of the field—

Being	£12
Its now value,	30
The difference,	£18, or upwards of 25 per cent, per annum on the outlay of £64 11s. 4d.

The next field was of the same value, was drained in the same way, broken up from grass, and the first year produced oats worth £4 5s. per acre; second year, potatoes, sold at £20 10s.; third year, wheat, valued for tithes at 30 bushels per acre, worth, according to the then value, £10 10s. The cost of drainage was £4 15s. per acre, and the field was valued the third year by a land surveyor at £2 10s. per acre, thus yielding 20 per cent. on the outlay for drainage. In both these cases the crops repaid the manures, labor, and current expenses, and the land was not, therefore, liable to charged with anything beyond the outlay for drainage.

It is unnecessary to adduce any more cases, as they are all similar, and yielded equally remunerative returns; but I need not remind the practical men now present that these results were obtained in more auspicious times than the present.

I have thus given you a brief outline of the principles and practice of land drainage, so far as they have fallen within my knowledge and experience; and I have now only, in conclusion, to hope, that however imperfect this sketch may be, it will, at least, have furnished you with some hints that may be turned to profitable account.

A discussion followed, in which a number of the members took part, and supported, generally the views explained by Mr. Scott, considering them in favor of a medium between shallow and the very deep draining now in vogue.

Mr. Edward Little, of Sheldon, stated that some drains which he had been instructed to put in, on the Marquis of Lansdowne's estate, in this country, a few years ago, at the depth of four feet and upwards, with the clay rammed on the top of the pipes, had effected little or no good; but that, on his own farm, drains which he had constructed ten or twelve years ago, from *two to three* feet deep, and filled with stones, were still perfect and efficient.

Mr. Blake, of Grittleton, also stated his experience as a drainer with stones during the last twenty years; and though he now preferred pipe draining, he contended for a greater quantity of stones on the top of them than four or six inches.

Other members then took part in the discussion, and asked for explanations on several points, which Mr. Scott gave, stating that he hoped the meeting would not give a preference to shallow and stone drains *because they* drew the rain water off the surface quicker than others; but would adopt such drains as would draw the water off in a reasonable time, and be permanent. He also stated that deep drains, in gravelly soils, have been known to prevent the land from "burning" in summer, though it had done so before; and on clays, it prevents cracking to the extent it would otherwise do. It was sometimes, however, very expensive to bring up level to deep drains, and existing diches were seldom sufficient. Mr. Scott did not think it necessary to say anything on sod wedge, and mole plough draining, as these operations were of a temporary character. He had, however, seen sod draining on peat bog, where pipes could not be laid, which had lasted sixty years.

The Chairman reviewed, in a clear and dispassionate manner, what had been stated, and summed up very ably; and the following resolution was then agreed to—

"That in the opinion of this meeting a good system of draining, liberally carried out, would be highly beneficial to this neighborhood; that the variety of soil in the district precludes the possibility of adopting any general principle—pipe, stone, and turf drains having the advantage according to circumstances. That the most permanent system of draining known at present is when done with PIPES, at not less than *three* feet, and distances to suit the soils. That in open or porous subsoils, collars should be put on the pipes; and in clay soils, six inches of stone, broken to pass through a *three*-inch ring, should be laid over the pipes, and the clay returned on them. That the manner in which draining can be done, so as to be most beneficial to landlord and tenant, is for the landlord to pay all expenses connected with the same (the tenant doing the haulage), and charge the tenant a reasonable per centage for the money expended, which per centage this meeting thinks should be five per cent. per annum."

UNDER-DRAINING.

All wet soils must be thoroughly drained, to render them in a fit state to be cultivated with the greatest advantage, whether the wetness arises from springs or surface water. After the land is drained, open furrows will seldom be required; if they are, the draining, in all probability, has been ineffectually and partially executed, and consequently the land will be only in a slight degree improved. One main object in draining is to admit the whole of the rain-water to percolate through the soil and subsoil, carrying with it air to the subsoil, and leaving the greater part of any fertilizing matter it contains in the surface soil, rendering the one more fertile, and gradually altering and ameliorating the texture of the other. When water is allowed to escape by open furrows, it must carry with it

a portion of the soil itself, together with some manure that may have been carried on the land at a great expense, with all the fertilizing matters the rain water may itself contain. In this case, the subsoil remains unimproved, instead of gradually becoming ameliorated by a frequent percolation of water through it, and consequently a free admission of air into it.

There are two great points to be attained by effectual under-draining; first to admit the rain-water to pass freely through the soil and subsoil, and, next, to render the surface soil in a more fit state for cultivation, and to produce better crops. Rain-water and air, it is now known, play a more important part in the economy of the vegetable kingdom than was formerly supposed.

Much has been said and written on the subject of deep and shallow draining. The proper depth to make the drains in clays and strong land will depend entirely on the capacity of saturation of the subsoil. During the descent of the water through the soil and subsoil, the drains cannot act any more than they would placed in a dry sand or gravel; but immediately the subsoil becomes saturated, the water ceases to descend, but rather to ascend in conjunction with that which reaches the surface-soil in rain. The drains prevent the ascending water rising above their level, and saturating the soil above.

During rain, there is a constant percolation of water through the soil and subsoil, until it arrives at the level of the drains, below which the subsoil is already saturated, and cannot absorb more; and the drains prevent saturation above their level, except that arising from capillary attraction. Deep draining is, no doubt, most effective, by preventing the water rising near the surface by capillary attraction, and reducing the temperature of the soil; and, in land in which saturation of the subsoil commences at a great depth, it is clearly the proper system. On very retentive land, such as the Wealden clays, where saturation commences near the surface, shallow draining must be adopted. Were deep drains made here, they would not act until after a long period—many days after rain—and much mischief, probably, had been done to the surface soil on land of less stubborn texture, drained by placing some of the drains deep, and others shallow. The deep drains would be the first and the last to act; indeed, the shallow drains could not act at all, except during, or after, very heavy and sudden falls of rain, so that the subsoil should become saturated up to their level, in consequence of the deep drains not having the capacity to carry off all the water, or keep it down to their level; and it would be physically impossible for the shallow drains to act unless this took place.

Drains cannot act until after the subsoil below them is saturated by the rain-water, or until the water is arrested in its descent, and saturation is ascending. In clays drains carry off ascending, and not descending water.

All clays lose much of their moisture during the summer, and generally become hard, dry, and cracked—the cracks, or fissures, extending sometimes to the depth of several feet. During the autumnal or winter rains, the land again becomes saturated, and when this has arrived at, or risen to, the level of the drains, they begin to act, and not before. This is the correct theory or under-draining clays—and it explains the cause of upright drains—made directly up an ascent, being more effective than those laid across a hill or rising ground.

In draining clays, and other soils, a stratum of sand, or mingled sand and clay, is occasionally found at various depths—this holds the water. If the drain pipes were laid in this stratum of sand and clay, a large body of water would constantly stand at their level, and would probably rise near the surface by capillary attraction. Therefore, to drain this description of land effectually, it is indispensable to place the drain-pipes a few inches below this stratum with the clay beneath. In this instance, the water does fall into drains—indeed it may be termed draining diffused springs.

To illustrate this theory of draining clays in a very simple and intelligible manner, let us suppose a barrel placed on one end, the uppermost end removed, and the barrel filled with mould and drain-pipes inserted through the bung-hole across the centre of the barrel, with some substance placed round the outside pipe to prevent the escape of water between it and the edges of the bung-hole; then pour water continuously on the mould from a watering pot with the rose on, that the whole surface of the mould may receive an equal quantity. The water will descend through the mould to the bottom of the barrel, passing the pipes, and not entering them; from thence it will rise and saturate the mould until it reaches the drain-pipes, which will then carry off the ascending water, and prevent saturation above them.

When a field is to be drained, and doubts are entertained of the proper depth to make the drains, it might be advisable to make, during the dry weather in the autumn, three short drains, 30 feet apart, and parallel to each other, one 5 feet deep, one 4 feet deep, and the other 3 feet. The proper depth for draining that soil would then be ascertained soon after the commencement of wet weather, and in time to execute the drainage that season.

No precise depth can be stated for making the drains either in clays or land wet from springs; capacity of saturation in one, and the position of the water in the other, must determine the necessary depth of drains.—*W. C. Selby, Ightham, Kent.—Gardeners' Chronicle.*

THE LENTIL—A NEW BRITISH CROP.

As the direction of agricultural inquiry seems of late years to have been turned especially after improved varieties and new species of grain, we shall give our readers a short account

of the cultivation in Scotland, and the history of the Lentil, or *Ervum lens* of botanists.

The lentil, although a new field-crop in Scotland, is so well known abroad, especially in Catholic countries, that the very name *Lent*—given in our country to the long fast of forty days, called *Carême* in France—appears unquestionably derived from the use of lentils during that period of abstinence from all sorts of animal diet. Its nourishing qualities were evidently known very early in the East; for we find its uses, both for the making of bread and pottage, recorded in several portions of the Old Testament. The "red pottage" (Genesis xxv. 29, 34) for which Esau sold his birthright, was made of lentils; and several references to them occur elsewhere in the Bible, as in Samuel xvii. 28, and xxiii. 11; Ezekel iv. 9, &c. "The lentil," says Lawson, "is a legume of the greatest antiquity, being in esteem in the days of the Patriarchs, and much prized ever since. In Egypt and Syria, the seeds are parched in frying-pans, and sold in shops for those who undertake long journeys." According to Dr. Shaw, the lentil forms a chief article of food in North Africa and Western Asia. We are told, too, in the *Gardeners' Magazine of Botany*, "that the Hindoos add lentils to their rice diet when engaged in laborious work;" and Dr. Royle, the first authority on the subject, records that now, as anciently, the lentil forms a chief article of food among the laboring classes. In France, Germany, Holland, all over continental Europe, the lentil is generally used in boarding-schools, in the army, in large families, and in hospitals, as one of the most nutritious and succulent legumes in existence, if not the first, for Einhoff obtained from 3840 parts of lentils, 1260 of starch (*fecula,*) and 1433 of a matter analogous to animal matter. From the researches of Playfair, it would appear also that the lentil is the most nutritious of all leguminous plants, containing more nitrogenous matter than any other, including the pea, the bean, and their varieties.

The *Ervum lens* belongs to the general order of *leguminosæ;* its calyx is five-parted; segments linear, acute; carolla, sub-equal; pod, oblong; one, two, and three seeded. Six species are natives of the Northern Hemisphere. The species termed botanically *Ervum tetraspermum hirsutum* presents us with those troublesome weeds of the New Testament parables called tares. They are natives of England; but the *Ervum lens* is a native of Eastern Asia, and of the south of Europe.

We come now to the introduction and cultivation in our country of that most excellent, nutritious, palatable and prolific seed.

Some years ago, at the time of the failure of potatoes, and the consequent distress of the poorer classes in Ireland and the Highlands, M. Guillerez, a French teacher, of Castle Street, Edinburgh, attempted to cultivate the lentils at South Queensferry, as a substitute for potatoes; and he spared neither trouble nor money, during three years, till he had fully succeeded in his experiments, although under the most unfavorable circumstances. It is true that the lentils were introduced into this country about the year 1545, but their cultivation was never attended to, and was entirely lost sight of. In 1835, Messrs P. Lawson & Son ripened specimens of the larger lentil, (not the best) at their Meadowbank nursery, but did not carry their experiments further. The only systematic and persevering attempts to ripen the seed, and acclimatise the plant, have been those of M. Guillerez, who has been awarded the large gold medal of the Highland and Agricultural Society in January last. He has sent specimens to the Great Exhibition. These attempts were carried on at Queensferry; and it has been found that seed of his own produce, ripened there, had proved more luxuriant than Continental seed newly imported from France, given to him in exchange by Lord Murray. At the moment we write these lines, M. Guillerez, not being discouraged by a law suit which he lost against the owner of the ground where he grew his lentils—through his ignorance of the law of this country in reference to leases—has selected another plot, in the same locality, and sown about the eighth of an acre with the two best kinds of lentils, which are already two feet above the ground.

Here then, we have room to hope that the lentil is in a fair way of being acclimatised.

M. Guillerez's plants grew, last year, to two, and even three feet in height—a luxuriance seldom attained in France. A dry, sandy, calcareous soil, in a sunny exposure, is requisite for the lentil; yet this gentleman sowed his seed in heavy garden-ground, exposed to all winds, manured with sea-weed and very little common manure. He put in the seed at various periods, the birds and insects having destroyed the greatest part of the lentils sown too early; and he has arrived at the conclusion that the worst kind of soil is adapted for the growth of lentils, and the best time of sowing is the middle of March, or the beginning of April.

They are sown in rows two feet apart, if they are to be propped by stakes; or eighteen inches with a row of beans between every row of lentils, to support them, if they are not properly sheltered from the winds. The seed in the drills must be pretty thin, like turnips. In open fields, the lentils are sown like tares, broadcast.

The plant is of a close branching habit, producing from 100 to 150 pods: M. Guillerez counted 134 on a single stalk. Care must be taken to keep away the birds; for pigeons, blackbirds, and sparrows, are very fond of the lentil when it begins to pod.

There are three kinds or varieties of lentils cultivated in France and Spain. The lentil of Provence is as large as a pea, with a luxuriant straw, and more fit to be cultivated as a tare, than for the grain as human food. The small brown or red, when the seed is old has the most agreeable flavor, and is preferable to all the

others for haricots and soups. The yellow lentil, a little larger and more flat than the second kind, being more easily unhusked, readily converts into flour, and serves for the base of those adulterated preparations so much and so long puffed in our journals. It is only the two last M. Guillerez has successfully ripened in the open air at Queensferry.

"The produce of lentils in grains," says Lawson, "is about a fourth less than that of the tare; and in appearance is not a third as much, the plants seldom growing above one and a half feet high;" yet the lentils sown by M. Guillerez have attained two, and even three and a half feet. "The straw is very delicate and nourishing, prepared for lambs and calves; and the grain, on the Continent, sells at nearly double the price of peas; but there is more food in one part of lentils than in two of peas, and they swell much by cooking." A *litre* of lentils (about 2 lb. weight) entire, unhusked will, produce two large and substantial family dishes, at a cost of from fourpence to fivepence; and if cultivated in our own fields, at a much less expense.

How is it that a vegetable so generally used on the Continent, cheaper, and more wholesome, more nutritious, more susceptible of digestion and assimilation as human food than any description of peas or beans, making delightful soup, very savoury to the taste when cooked with ham, or when its farina is used for puddings or *purée* with any kind of meat, should be almost unknown in this country? The character of the lentil, both intrinsic and economical, seems to point it out as a substitute for the potato; and the important question is, whether it would thrive under general culture, in this soil and climate, as luxuriantly as that root? One of our scientific growers, (Lawson) has given his testimony in the affirmative.—*Agriculturist's Manual*, p. 95. Why is it then, that, having free trade in corn of all kinds, this foreign crop is not in the meantime more largely imported for British consumption? The seed is not to be found even in our best seedsmen's shops, and M. Guillerez gave a few pounds of his own crop to one of our best seedsmen, in exchange for small seed worm-eaten and twenty years old—having never been asked for, and yet good enough for seed. We understand that M. Guillerez is willing to give his last 15 lbs., in small lots, to any farmer who wants to try the cultivation of them immediately. What prevents the landlords of Barra, Syke, the Highlands, Shetland, &c., from trying them on a small scale, at first, since they have plenty of sandy or callareous soil and sea-weed for manure? Let it be remembered, that the cultivation of the lentil is not more difficult than that of the pea; that their harvesting is the same, and they ripen sooner, being ready in the first week of August if sown in March or April.

Pain is the father of wisdom—love, her mother.

R. Hardson's Rural Handbooks.—The Cow: Dairy Husbandry and Cattle Breeding. By M. M. Milburn, Author of Prize Essays of the Royal Agricultural Society. London: Wm. S. Orr and Co.

The numbers which have been issued of these "Rural Handbooks" promise to supply a vacuum in our cheap Agricultural literature which was so much needed. Works on farming generally have hitherto been too costly in their productions—but these Handbooks are an exception. The writer of the number before us is well known in the agricultural world for his peculiar talent and experience, and we heartily recommend the work to our readers. We have extracted the following:—

DAIRY MANAGEMENT.

Milk consists chemically of three parts;—a watery or aqueous portion, in which its sugar and salts are dissolved; an oily, or oleaginous, and a solid and albuminous principle; it thus affords in turn a supply of the materials for replacing the waste of the old, or constructing the new animal which partakes of it. The saline and saccharine part forms at once the solids of the system, and the means of sustaining animal heat; the oleaginous furnishes the reservoir of fat, to be available in times of adolescence or scarcity; while the albuminous part gives the means of forming sinew and muscle; and thus milk is the *multum in parvo* of mammalian food.

A little before parturition, the new sympathies of the system cause the mammiferous glands to swell and enlarge; adolescent before, they now become ready for energetic action; and no sooner is the young brought forth, than the aliment of nature is ready for the sustenance of the being which, so short a time before, derived its subsistence from an internal, as it is now preparing to do from an external source.

If the milk taken from the cow be allowed to stand in a shallow dish, a change takes place in its appearance as soon as the cooling process begins. A whitish-yellow substance, thicker than the milk, separates from it, and swims on the top, forming an adhesive coat, covering the whole—this is the cream, the richest part of the milk—leaving the mass below thinner, and of a bluish tinge, well known as skimmed, or blue milk. If the upper layer is examined by the microscope, it will be found to consist of a large accumulation of minute globules; these globules are the oily or butyraceous parts of the milk, coated with a thin covering of a more solid substance; and this may be separated from the mass almost entire. Here you have the greatest part of the butter, with some mixture of other matters. The greatest part we say, for some of the globules of oil or fatty matter, are still suspended in the milky mass.

If the milk so skimmed is allowed to remain, a change takes place, more or less rapid, according to the temperature. In hot weather this is very rapid indeed. The albuminous or solid portion of the milk, is one which contains an

ammoniacal principle, and is liable to run very rapidly to decay. It begins to ferment, and an acid is formed, which immediately determines the solid parts of the milk by uniting with an alkali, which keeps the solid part of the milk in a state of solution; under these circumstances are formed two substances, technically known as curds and whey. The solid portions are distinctly developed, and fall down—these are the curds; the watery particles in which they were before dissolved, are also determined, and become the whey.

If these be now separated, the solid parts—acted upon by the changing agency of the nitrogenous matter, having moisture, heat and air added—soon shew signs of putrefaction; mouldiness and decay induces the deposit of the eggs of innumerable insects, and the whole mass very soon becomes a heap of putrefaction. If the whey, or watery part, is then suffered to ferment, and this is exposed to sufficient heat and plenty of air, another kind of fermentation will take place, and a slightly alcoholic drink will be produced, which is used for exhilarating or intoxicating purposes by some of the inhabitants of the north-east of Asia.

As the separation of the cream from the milk does not take away all the oily or butyraceous matter from the milk, neither does it remove the whole of the solid (caseous) matter from the cream. The envelope of the oleaginous globules is of this same albuminous and changing substance, and in this, by absorbing oxygen from the air, a change also takes place—curds and whey are formed in the cream itself, but intermixed with a considerable quantity of butter. This butter may be separated in various ways; heat will send it to the surface by breaking the enveloping globules of casein; but being merely animal oil, it has an insipid taste, and is very different from our table butter. Agitation, with warmth, especially after incipient fermentation has gone on, is the most effectual mode of breaking down the globules, by fracturing their enveloping skin, and this is the well known process of *churning*, of which we shall speak more fully in reviewing the several dairy systems.

Let it be remembered first of all, in considering the constituents of milk, that it contains 87 parts of water, something more than 4½ parts of sugar, a little more than 3 parts of butter, something beyond one-half part of saline matter, and 4½ parts of cheesy matter (curd or casein). Its weight, from containing so many matters in suspension and solution is some three per cent. greater than that of water. The milk of different animals, however, contains different properties, and is different again according to the breed, food, and treatment of the animals. The following exhibits a few of these differences:—

	Cow.	Woman.	Ass.	Ewe.	Mare.
Casein (curd)	4.5	1.5	1.8	4.5	1.6
Butter.....	3.1	3.6	0.1	4.2	trace.
Sugar.....	4.8	6.5	6.1	5.0	8.7
Salts.....	0.6	0.5	0.3	0.7	89.6
Water.....	87.0	87.9	91.7	85.6	89.6
	100.	100.	100.	100.	100.

Now all dairy operations are aids for developing, or arresting these natural changes of milk; and if we give a faint outline here of the principles of these processes, it will very much assist in determining the relative value of the different dairy system when we come to details.

The object of the dairyman is sometimes to assist and sometimes to retard these natural stages of decomposition into which the milk will run when left to itself; sometimes it is necessary to defer, sometimes to hasten these stages, and he possesses great power for controlling them. Thus heat, it will be seen, is necessary to all these stages of action. Hence in winter he can easily arrest, and by artificial application as easily advance the manipulations of his craft. But in summer it is not so easy to control. He has often to be in his dairy watching his milk under the influence of the sun's rays, and he contrives his dairy so as to keep out the hot rays of the sun as far as possible; or he endeavors, by evaporation or profound shade, to counteract their influence.

To begin with the new milk, it is by no means necessary that the cream should be separated from the milk. If butter be the object, it can be attained without any separation of the cream. There are two modes of breaking the globules of casein, one by the application of a gradually increasing gentle heat to the new milk, until the butter matter floats at the top, which is then taken almost in a boiling state and churned to butter in a very few minutes. The other is, by at once applying the beaters of the churn to the whole mass of the milk; but, as the bulk of liquid is so much greater in the latter case than the former, and skim-milk is of greater value than butter-milk, it is much less frequently resorted to.

Generally the cream is allowed time to ferment. This process aids in breaking down the structure of the enveloping skin, in precipitating the casein of the mass, and thus assisting the maturation and development of the butter. In churning, the heat of the mass rises from five to ten degrees, and in very cold weather it is sometimes necessary to pour in boiling water in order to obtain the necessary heat. This heat is also indispensable in separating the cream. At a temperature nearly freezing it will rise with difficulty; perhaps the most regular and healthy temperature is 55°, but so rapidly does it rise at 76° or 77° as to require great skill and watching to prevent the whole of the mass becoming sour. At the first named temperature it will be perfectly raised in twenty-four hours, and may be kept two meals; but in the latter state of the temperature it will be complete in ten or twelve hours. As the globules have to rise by specific gravity chiefly, it is desirable that the milk should be disposed in shallow dishes. Glass is clean

and beautiful, and porcelain is fashionable, but lead is the old fashioned and useful medium, retaining the heat of the hot water from the scalding process in winter, and slowly conducting the heat after the cooling from evaporation after the same scalding in summer. The desirable temperature in churning cream is 54° to 55°, a degree of heat preservable only in summer by early churning, and in winter by raising the temperature by scalding the churn before that process, with boiling water, heating the cream at the fire before placing it in the churn, or by adding boiling water to the mass in the churn.

Besides the matter we have alluded to as being present in milk, and consequently in its products, we must not omit the aroma of the food consumed by the cow. In the case of turnips this is very distinct, and sometimes very disagreeable,—causing even pastry to partake of the undesirable flavor. In the spring of the year milk will even have a bitter taste, from the vigor and freshness of the herbs consumed by the cows at that season; but the change from the insipidity of the milk and butter produced by hay-fed animals in winter is so great that even that is agreeable.

The writer then alludes to the manufacture of cheese in the several districts, and remarks—

THE DAIRY

Is, perhaps, of all other appliances, the one on which success most depends. It should be apart from all household operations, from open grates, and from dung-heaps, and should have as much as possible the means of an equable temperature. As, however, it is much easier to keep a cold building warm, than to cool a hot one, it is desirable that it should be as much as possible shielded from the sun's rays. It should have its side to the north, its ends to the east, and should, if possible, be let into the earth a few feet, but not so deep as to interfere with the drainage. If covered by a large tree it would be all the better. Around it should be either a hollow wall, or peat earth should be walled round its exterior; or, as another alternative, and possibly the best but most expensive, it should be surrounded by a verandah. It should also have a double roof, and abundant top and side ventilation,—either of which should admit of being closed. It is necessary to have in it a pump, the floor sloping, and on the highest part a perforated pipe should be connected with the pump, to allow of the cleansing of the floor with cold spring water when necessary. The bowls should either be earthenware or glass dishes, placed upon wooden tables—fir, maple, or sycamore are the best—leaden bowls may be used, placed on frames, and surrounding the dairy. Slates are the best for the floors, and a lining for the walls of white pottery is not only elegant but useful; a pipe connected with the boiler attached to the kitchen fire is a great advantage, with a stop-cock, so as to regulate the heat of the room in winter. The scalding and churning rooms should be distant from the milk-house, and the latter should be kept as free as possible from all kinds of foreign matter. An outer verandah is useful for drying the dishes and pails, and therefore desirable when the dairy is sufficiently extensive to render the expense of its erection judicious.

Following the order already indicated of describing, first, the butter-making, and then the cheese,—the latter being perhaps of more commercial importance,—and taking, first the systems adopted in the most celebrated dairy district of the kingdom, and slightly alluding to the peculiarities of some systems pursued abroad, brings us to

THE AYRSHIRE DAIRY SYSTEM.

A district celebrated in Scotland, and in the north,—and justly so,—for the manufacture of *Dunlop cheese*. These cheeses are from two to four stones in weight, and hence, to make one large cheese at a meal requires a dairy of at least fourteen cows. In this case a cheese is made night and morning, but, if a smaller dairy is kept, the night's milk is reserved till morning, the cream skimmed off, and both being warmed, so as to make the whole mass 90° to 95°. Following the course of the large dairies, however,—those where the cheese is made in the greatest perfection, namely, from new milk as it comes from the cow,—a large cheese-tub is placed in the dairy, and upon this is placed a framework of wood, denominated a ladder. Over the whole is placed a thin linen strainer, and the milk, if sufficiently warm, viz., at least 85°, is strained through this cloth into the tub. If, however, it should not be of that heat, it is placed in a deep tin or copper vessel, and inserted in a furnace of hot water, until it attains the requisite degree of heat,—for all the success of the cheese-making from the rich milk of the Ayrshire cows depends upon this precaution. If the cheese is made from milk of a less heat than this, the curd does not contract properly and some is wasted in the whey—nor is the cheese so compact; whereas if it is much hotter than 90°, except in winter, when it cools down considerably in the very operation of making, the cheese will ferment and the casein run through its various stages of decay.

The next process is that of adding the rennet. This consists of the stomach of calves, at least one year old, steeped in salt and water, in the ratio of three to the gallon, and, in the best-managed dairies at least, a lemon is added to take off the bad flavor. This stands for some two months, and is called *yirning*. A tablespoonful of this solution is added to each hundred quarts of milk, and the whole is covered by a woollen cloth to prevent the escape of the heat.

When the curd is sufficiently firm for breaking, usually about a quarter of an hour after the rennet has been added, it is cut in all directions—a knife with three blades being preferred, as expediting the process—so as to have the curd in cubic pieces. It then begins to sink, and as much of the liquor (whey) is taken out as can conveniently be removed in a wooden

dish. The cutting of these cubical pieces again commences, slowly and cautiously at first, to break the curd as little as possible, but more rapidly afterwards, until the whole of the pieces are thoroughly divided, and made quite fine. It is then allowed to settle for some fifteen minutes, and the whey again taken from it with the dish, and strained through a fine hair-sieve, to arrest any of the small particles of curd which may be taken up with the whey. The curd is then cut out, and laid in a heap in the tub, to allow the whey still to drain away, but only by the pressure of its own weight; and when all the whey that will leave it has been so expressed, it is placed in the cheese-vats, which were before covered with a cloth, remaining there for half-an-hour, under a pressure of about a stone weight, to press out the remaining whey, but leave the fatty or butyraceous particles in the curd. It is then taken out and cut into slices, and again subjected to a greater pressure, and either broken fine by the hand or torn in pieces by a curd-mill until it becomes almost reduced to crumbs. It then undergoes the salting process, which generally takes place at the rate of 7½ ounces of salt to the English stone of cheese. A fine linen cheese-cloth is now washed in warm water, wrung, and placed in the chessel, or chessford, and half a hundredweight laid upon it for an hour; this is doubled for another hour, when the cheese is taken out, placed in another cloth, and again put under an increased weight for about three hours. This continues for about four days; every time changing the cloth, and generally turning the cheese upside down; and the weight is increased until the cheese arrives at a degree of consistency to bear the pressure of a ton.

When taken out of the press, the cheeses are placed in a very dry and somewhat warm atmosphere, often within the range of the influence of the kitchen fire, turned several times a day, and rubbed with a dry cloth. This continues for a week or ten days, when they are removed to the cheese-room, where they are exposed to a cool dry atmosphere; a gradual mode of ripening being, at this stage, necessary to their proper condition. The Dunlop cheese is seldom colored, though some herein imitate the Gloucester and Cheshire fashion. The peculiarity of management is that of making the cheese from the milk from the cow before it cools.

THE CHESHIRE DAIRY SYSTEM.

The Cheshire cheese is as celebrated in England as the Dunlop is in Scotland, and it has long received the greatest attention from the Cheshire dairyman. The evening's milk is set up until the morning, when the cheese is generally made, and the cream taken off. The skim-milk is scalded to about 100°, and one half of it, mixed with the new milk from the cows of the same morning, is strained through a fine hair or gauze sieve, while the remaining half is mixed with the cream, which is also added, so that the whole mass is about 83° to 85°; the annatto being added to the mixture in the proportion neccessary to give the color aimed at in that particular dairy. Two pounds of annatto are generally considered adequate to color a ton of cheese. The rennet is prepared exactly in the mode described in speaking of the Dunlop cheese, and added in about the same proportion. The tub is then covered with a wooden cover, and a cloth placed over it to keep in the heat, and remains about an hour in this condition. The curd is then gently but thoroughly cut with a cheese-knife, until it is divided into small pieces, and is again left covered for an hour to settle. The whey is then taken out by a pan or dish; the dish being pressed gently on the curd, to gather up the whey. The curd is laid on a heap in the tub, and gently pressed. As more and more of the whey separates, the curd may sustain the greater amount of pressure without fear of forcing out the fatty matter. A perforated board is placed over the curd in the tub, and a weight, of from twenty to twenty-five pounds, placed upon it, and again the whey is baled out; it is then turned, and the same board, with a greater weight, placed upon it. It is then cut into square pieces, and pressed once or twice, when it is fit for the vat or chessford, which has in it a coarse cloth. Before being put in, the curd is broken into smaller pieces and salted, then piled up in the chessford, and covered with the cloth by having its edges turned over it; and as soon as the curd adheres, a cover is placed on the chessford, and the whole is pressed by a thirty pound weight. The curd is then punctured on all sides with skewers to admit of the free escape of the whey. It is taken out, cut in slices, and again subjected to more pressure, and more punctures by the skewers. The pressure is again increased, and the cheese frequently turned and the edges pared; the paring being placed on the top of the cheese, and preased into the centre. A pressure of sixteen hundred weight is now given, the cloth changed, and the cheese turned several times in forty-eight hours; then taken out, and immersed in or covered with salt. It is sometimes salted by washing it with salt brine, and is, when taken out of the chessford, placed in a cylinder or hoop of proper dimensions, when it is washed in warm water, dried with a cloth, and placed on a shelf to dry, where it is allowed to remain a week. It is afterwards washed and dried again, and anointed with fresh butter. It is placed in a somewhat warm situation, and rubbed every day, for one week more, with butter, which much improves its character, and above all, its appearance.

HIGHLAND AND AGRICULTURAL SOCIETY

The first monthly meeting of the society for the season was held in the Museum on the 19th ult., Sir John M'Neill, G.C.B., in the chair.

The Chairman stated that the subject for to-day's discussion was—"The best modes of feed-

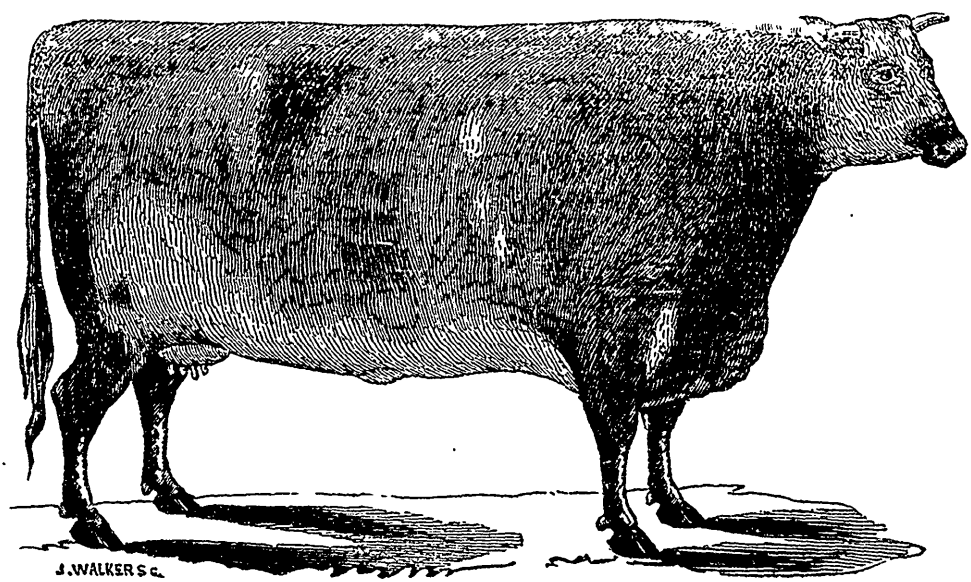
ing and housing fattening cattle, and the breeds most suitable for different districts."

Mr. Wilson, Edington Mains, said—I crave indulgence, when thus entering upon a fresh series of these periodic meetings, to offer a few preliminary remarks with reference to this particular means of furthering the ends aimed at by this society. It cannot be denied, that they have been productive of good; and it is satisfactory to find, from the increased interest taken in them by practical farmers, that the parties most competent to judge of their merits have pronounced in their favor. But having so largely obtained the ear of their professional brethren, it is of the utmost consequence that those who are called to take part in these discussions should be impressed with the importance of being accurate in their statements and guarded in their conclusion. The welfare of the community is surely the best guarantee for individual prosperity; and the more that we interchange our experience, and have community of knowledge, the better for our country and the better for ourselves. The subject which has been selected for discussion to-day is, you are aware, "The best modes of feeding and housing fattening cattle, and the best breeds for fattening." That part of the subject which relates to "feeding," was so fully handled in the discussion which took place here a year ago, that I have nothing to add to what was then stated upon that head, and shall, therefore, confine myself to some remarks upon the two other branches of the subject. The question as to the best housing for fattening cattle must be solved partly on general principles, and partly with reference to the circumstances of individual farms. Quietness and warmth are such indispensable conditions of well-doing to fattening cattle, that no plan of housing can be good which does not in some good measure secure them. The food may be of the best, the attendance unremitting, and the breed faultless; but if the timid or weak are molested by the strong or vicious, it is impossible that they can thrive. A solitary stall or box would secure its occupant from this evil: but as cattle are naturally gregarious, such a prisoner would suffer from a restless craving for the company of its kind, and a right arrangement must, therefore, provide for such separation as still admits of society. The times and modes of administering food have also an important bearing upon this point. If the habits of cattle when at pasture are observed, it will be noticed they have stated times for browsing and for repose—that after a process of diligent eating, there follows a lengthened period of satisfied recumbence, and leisurely rumination. Now, if, under our artificial mode of treatment, their food is supplied either too frequently, or too seldom, or at irregular intervals; if they are frequently roused from their lair, or disturbed at feed by unseasonable inspection, or the intrusion of dogs, &c., into their quarters, they will get into a state of nervous excitement which never fails to mar their progress. Thorough quietness is, therefore, an indispensable element in the fattening of cattle, and must be provided for in arranging their winter quarters. In addition to this, there must also be adequate protection from cold. It is now ascertained that a considerable portion of the food consumed by warm-blooded animals, is expended in maintaining the natural heat of their bodies, and that this is effected by a process strictly analogous to combustion. We are warranted, then, in regarding the portion of food thus disposed of as so much fuel, and the fat, which in certain circumstances is accumulated in their bodies, as a store of this fuel laid up for future exigencies. Keeping this in mind, it is evident that if fattening cattle are exposed to a low temperature either their progress must be retarded, or a great additional expenditure of food be incurred. Farmers have long been aware that cattle thrive best when kept dry and moderately warm, and they have explained this vaguely by saying, that they are most *comfortable* in such circumstances. Modern science, however, has taught us that there is an analogy in this respect between animals and steam-engine boilers. Prevent radiation of heat from the latter by a sheathing of some non-conducting substance, and you get more steam from less fuel. Protect the former by suitable clothing or housing—that is to say, keep in their animal heat—and they will eat less, and yet lay on more fat. This fact, then, must also have much influence in determining the question now before us. I need scarcely remark, that the modes of housing which at present divide the suffrages of the agricultural community are, stalls, yards, and boxes. Stalls were at one time so exclusively used for the accomodation of fattening cattle that *stall-feeding* has become the recognized phrase for expressing the process. By a recent discussion in the London Farmers Club, it appears that in some cases the whole yard has been roofed, so as at all times to secure cattle, food, and manure from the vicissitudes of the weather. Another feature in this plan, is that the cattle are tied up for meals, to prevent mutual interference, and afterwards unloosed. At the time when this account was published, I happened to be engaged in preparing an article on the farm management of cattle for Morton's Cyclopædia, now in course of publication, by Messrs Blaikie of Glasgow, and as it was evident that the practice, if found useful, was quite as applicable to open yards as to covered ones, I felt curious to ascertain the exact amount of labor which this tieing up and unloosing would involve. Knowing that my friend, Mr. Robert Harvey at Port Dundas, is in the habit of turning out his immense herd of cows in relays of one hundred, so as to allow of each cow being at grass for a few hours daily, I wrote to him for information on this point, and now quote from his obliging answer:—"I have now ascertained, after repeated trials, that two men can easily unloose a hundred cows in ten minutes, and tie them up again in twenty. The herd boy who waits on the cows in the field

stands at the door to prevent too many of them from crushing in at a time; andsometimes guides a few of those nearest the door into their stalls, but never ties any of them. This is, however, after they have been let out and tied in for some months. At first they are much more troublesome, and may, perhaps, take an hour to tie up; but it is astonishing how soon they learn to know the side of the byre they ought to go to, and nearly the part of the side, especially all those nearest the door. We always put them to the very same stall each time. I would consider it a very easy matter, indeed, and the work of a very few minutes, to tie up six or eight peaceable animals in one place three times a day. I have adopted the plan of tieing up the young calves at meal times, and letting them loose as soon as they are fed." I have not tried this plan, and therefore do not recommend it; but it seems feasible enough, and Mr. Harvey's very interesting statement shows that the labor implied in it, need be no obstacle to its adoption. The improvements which have gradually been effected in our yards, have quite pointed towards that more recent contrivance for the housing of cattle —viz., boxes—which remains to be noticed. These are now too well known to require minute description. Indeed, with the exception of the main feature—the confining of each animal in a separate covered compartment of from 8 to 10 feet square—they are to be found in endless variety, and this because they are seldom new erections, but rather sheds, or other buildings converted to this use. My own are exclusively of this kind, the largest of them occupying three sides of a yard formerly used as a lambing shed. There is room for a large heap of turnips in the centre of this area; from the nearest side of which, the cattle all round can be supplied with little labor. When the manure has to be removed, this arrangement also admits of a cart being backed close up to each box, and of the dung being thrown direct from the one into the other. As the subdivisions consist of moveable flakes, this yard with sheds can at any time be restored to its former state with very little trouble. The most complete set of cattle boxes which I have yet seen is at Riby Grove, in North Lincolnshire. These consist of sixty boxes, in six parallel rows of ten each, under three contiguous roofs. The roofs are entirely of iron—a framework of bars covered with corrugated plates, like what we see at some railway stations. There are thus twenty compartments under each roof, and these are parted down the middle by an alley four feet wide, on which rails are laid, so that food can be brought in, and manure removed on a small truck which is pushed along by a man. Across the end of each range of boxes a space is reserved for the storing and preparing of roots and other food. The outer doors of these store places are wide enough to admit a cart, the inner ones being of the same width as the alleys. A series of cast-iron troughs, each of which is common to two boxes on the two outer rows, and to four in the inner ones, and which communicate by a pipe, afford a constant supply of water to each animal. The whole arrangements are very complete, are well adapted for economizing food and labor, and admit of the stock being inspected with ease and comfort. I never saw as many cattle together so thoroughly at their ease. Indeed, the whole aspect of the place was more that of a menagerie than of a farm-yard. The trials which I have made of this plan of housing cattle have been so satisfactory, that I have now nearly the half of my lot put up in this way, although in very rude erections, when compared with those which I have just been describing. This plan of housing is especially suitable for heifers and quarrelsome cattle; and I have seen animals, that while in a yard were in constant turmoil, at once reduced to quietness by being put into boxes. I need not say that this alone would be sufficient to account for their more rapid improvement. I have hitherto in a great measure restricted my remarks to the influence which these different modes of housing exert upon the fattening process; but the quality of the manure produced in them respectively is an important element in determining their comparative merits. As that made in boxes is thoroughly protected from the weather, retains the greater part of the urine, and is trodden so firm as to hinder fermentation, it seems reasonable to conclude that it must be superior to that produced by the other plans; but as I have not had recourse to comparative trials, my opinion rests upon inference only. I must here observe, that I should not like to trust to the whole of the urine being absorbed by the litter, especially in boxes which are sunk a foot or two below the surface. Unless a thick layer of burnt clay or similar porous substance be placed in the bottom of the box. I consider it indispensable that it should communicate with a drain. When the litter has accumulated to a considerable depth, it will then retain the greater part of the liquid; but I would not trust to it for absorbing the whole. So far, then as my experience goes, it is certainly in favor of the box system; and I have accordingly adopted it for the half of my cattle. But last winter was so unusually mild, that I do not regard its evidence as conclusive, and have therefore resolved to await the issue of further trials before going into it more largely. On the question of the comparative merits of breeds I look for greater diversity of opinon than on the other branches of the subject under discussion. We are so much the creatures of habit, that there insensibly grows up in most of us a prejudice in favor of the usages of our own locality, which blinds us to what is defective in our own practice, or excellent in that of others. There are few things in regard to which this prejudice shows itself more strongly than about live stock. Having all my life been most familiar with short-horn cattle, it is quite possible

that I may have bias in their favor; but, believing, as I do, that this is the best breed for all those parts of the country where turnips can be cultivated with success, I shall endeavour to state as impartially as I can, the grounds of this belief. I think it not unlikely that in framing the topics to be discussed to-day, that part which refers to breeds was expected to be viewed very much in this way:—Supposing a low-country farmer about to purchase a lot of cattle for fattening on turnips, on what breed will he do best to spend his money? Now, not to mention that, practically, this will be decided by what he happens to fall in with best worth the money in the market which he buys in, I must say, that this appears to me too restricted a view of the question. Unless we consider the interest of the breeder, as well as of the feeder, and inquire not merely which breed of cattle, when comparatively mature, will pay best for fattening, but which will yield the best return for the food consumed from birth to maturity, we shall fail to do justice to the question before us. In those trials of the fattening qualities of cattle which have frequently been made between equal numbers of Hereford, Devon, Angus, or Galloway oxen, two or three years old, and short-horns of the same age, the results have frequently been in favor of the former. Such trials, however, leave the peculiar merits of the short-horns quite out of view. If properly treated they would have been ready for the butcher at the age they had reached when these comparative trials were begun. Let *calves* of these various breeds be started together, and fully fed until they are eighteen months or two years old, and then the superiority of the short-horns will be fairly brought out. So long as low-country farmers can obtain a full supply of grazing cattle at moderate prices, they may find it more profitable to buy than to breed for themselves; and as long as the difference between the buying and selling price is sufficient to yield a profit on the food consumed, it matters little to him what breed they are of. So soon, however, as he finds that he must breed for himself—and perhaps we are now about at that point—there is nothing that can equal the short-horn for his purpose. It has long been supposed that the breeding of cattle cannot be made profitable on highrented land. If there was an inherent necessity for their passing through a protracted period of lean existence before the fattening process could be begun, this would certainly be true. But it is the capacity in the short-horn, when well fed, of growing and fattening from his very birth, and the almost incredibly early age at which he can be brought to profitable maturity, which removes theis difficulty, and renders breeding profitable on the best of soils. But supposing it conceded that short-horns are entitled to the preference of the low-country breeder, I may be asked, are they suitable for those high-lying on poor soils, where cattle can be reared but not fattened? We have so long been used to see only lean cattle brought from such districts, that we have come to the conclusion that they can produce nothing better. There is, however, no necessity for this; and if the occupiers of such farms would but try the plan of keeping no more stock than they can do justice to, and of selling them when they cease to improve in their own hand they would find their profits very much greater than on the starving system. To illustrate this, I will refer to a series of sales of cattle which have fallen under my personal observation during the present year. Not long ago a very skilful breeder in Teviotdale sent one of his calvest not quite eight months old, to Newcastle market, when it was sold to a butcher for £8. This was no, a suckled calf, but one of a large lot, reared on a very scanty allowance of milk, and fed chiefly on turnips and cut clover, with a moderate quantity of linseed and other meal. At Whitsuntide last a lot of yearolds, bred in the heart of the Lammermoors, was sold to a low-country grazier at £8. 8s. ahead; and to show that this was not a chance sale, I may mention, that for a series of years the yearlings from this farm have brought similar prices, and have even reached as high as £10 10s. In May and June last, large numbers of two-year-old short-horn steers from the north of England, were sold in our Border markets, at from £6 to £7 ahead. Many of the cattle bred in the higher parts of Roxburgh and Berwickshire are now sold to the feeders at six-quarter-old, and in our recent markets the current price for such young cattle has been from £6 to £7 ahead. Very large droves of two-and-a-half-year-old cattle are now regularly brought from England to our autumn markets, and from £7 to ahead is about the average price at which they have been sold during the past six weeks. Here, then, are examples of cattle of the same breed, varying in age from eight months to two and a half years, all bringing about the same price; but with this difference, that while the well-fed calf left its owner fully 4s. a week for the food which it had consumed; the starved two-year-old would barely reach 1s. Or take the less extreme example of one-and-a-half, and two-and-a-half-year-old cattle, both passing from the breeder to the feeder at the same price per head, and see how the interest of both parties are affected. To the breeder the saving of a whole year's food, attendance, risk, and outlay of capital is just the difference between a profit and a loss. With the feeder, again, the matter stands thus: if equal in point of breeding, and similarly treated, the two ages will probably attain to the same weight when fat; but the younger cattle will require less food, and having never lost *lier*, will have the advantage in quality of beef, and bring a better price per stone. Such, then, are the reasons which lead me to the conclusion that short-horns are the best breed of cattle for the arable lands of Scotland. Let me, however, remark, that it is to genuine short-horns that my statements refer, and not to any kind of mongrels that people may choose to call by that name. Indeed, it is lamentable to think of the loss which is annually incurred over Scotland by the breeding of inferior cattle. It is difficult to estimate this loss correctly; but after careful consideration, I have come to the conclusion that it cannot be less than 30s. a head, on two-thirds of the whole cattle fattened in the country. If this be true, then it follows that without expending a farthing more than is done at present of food, housing, and attendance, the profit which would accrue by breeding only from bulls of the best blood would be equivalent to an advance of 6d. per stone in the price of beef, as regards two out of every three of the fat cattle at present brought to market. The outlay of an additional £10 per head on the price of all the bulls used, would be sufficient to secure this profit. Now, as with proper care one bull may suffice for sixty cows, and continue serviceable for three years, this extra price would not usually add, more than 2s. a head to the prime cost of each calf. When such an ample return can be secured for so small an outlay, it is to be hoped that the breeders of cattle will by-and-by discover how much they have been losing by grudging the price of a good bull. It is interesting to observe how thoroughly the breeders of sheep are now alive to the economy of using only well-bred males. All who have had business in our sheep markets during the last twenty years, know

to what an extent the breeding of crosses between Leicester rams and Cheviot ewes has increased during that period, and also how superior the quality of this kind of stock is now to what it was formerly. Now, let us mark the history of this improvement. I well recollect when, as the autumn fairs drew near, our Border jobbers used to provide for them by retaining such rams as they happened to pick up in their weekly purchases of fat sheep. From these miscellaneous collections very many hill farmers were accustomed to make their purchases, caring little about quality, so that the price was low enough. By-and-by, however, they began to discover that there was an awkward connection between low-priced rams and a low price for their produce; and the consequence is, that they now supply themselves from ram breeders of established reputation, at prices which induce the latter to breed first-class animals for this express purpose. I would fain hope that breeders of cattle will also find out the economy of paying more attention to the quality of their stock. Landlords might so easily further this improvement, and have such a manifest interest to do it, that I cannot refrain from directing attention to what has been going on for several years on the estate of Cavers. With the view of improving the cattle bred on his estates, Mr. Douglas had for some years given a handsome sum of money for prizes to be competed for by his tenantry; but having been led to think that this end might be obtained in a more direct way, he intimated through his factor that he would give £80 for the purchase of a first-rate short-horned bull, which should be so stationed as to be available to all his tenantry. The tenants, about twenty five in number, were requested to appoint a committee from among themselves, to whom was intrusted the purchase of a bull, and the framing of regulations for carrying out their landlord's intentions in an equitable manner. The plan which they have adopted is, to allow £20 a year to the tenant who keeps the bull, restricting the number of cows to be sent to him to seventy, at a charge of 6s. each, and apportioning this number to the different farms, according to their sizes. Two bulls, both from Yorkshire, have now been purchased in pursuance of this plan, and an improvement is already apparent in the stock. Here, then, is an example which might everywhere be followed with very great advantage to all concerned. In its details the plan is certainly susceptible of improvement; and from the good sense already displayed in the matter, I have no doubt that by-and-by this will take place. On the present plan each tenant can only have a few calves from the high-bred bull, and the bulk of his lot must still be of inferior descent. Now, were they to club together, and raise such a sum as, when added to their landlord's gift, would suffice for the purchase of four or five bulls, the quality of the whole cattle bred on the estate would be raised at once, and present a uniform character. By selecting the bulls from different herds, and shifting them as occasion required, from one district to another, the same lot might suffice for a good many years. Were such a plan as this to be generally adopted over the country, it would, in a very few years, produce a greater improvement in our breeds of cattle than any system of premiums is likely to do, in the course of a generation.



PRIZE SHORT-HORNED HEIFER, BUTTERCUP

THE PROPERTY OF CHARLES TOWNELEY, BURNLEY, LANCASHIRE,

Was awarded the First prize of Ten Sovereigns, as the best in her Class; and the GOLD MEDAL, as the best of all Prize Cows or Heifers exhibited at the Show. The owner also received the Medal, as the breeder of the best cow or heifer. Calved May 1, 1849; bred by Exhibitor; got by Jeweller; dam, Buttercup, by Garrick; g. d. Barmpton Rose, by Expectation.

Agricultural Journal,

AND

TRANSACTIONS

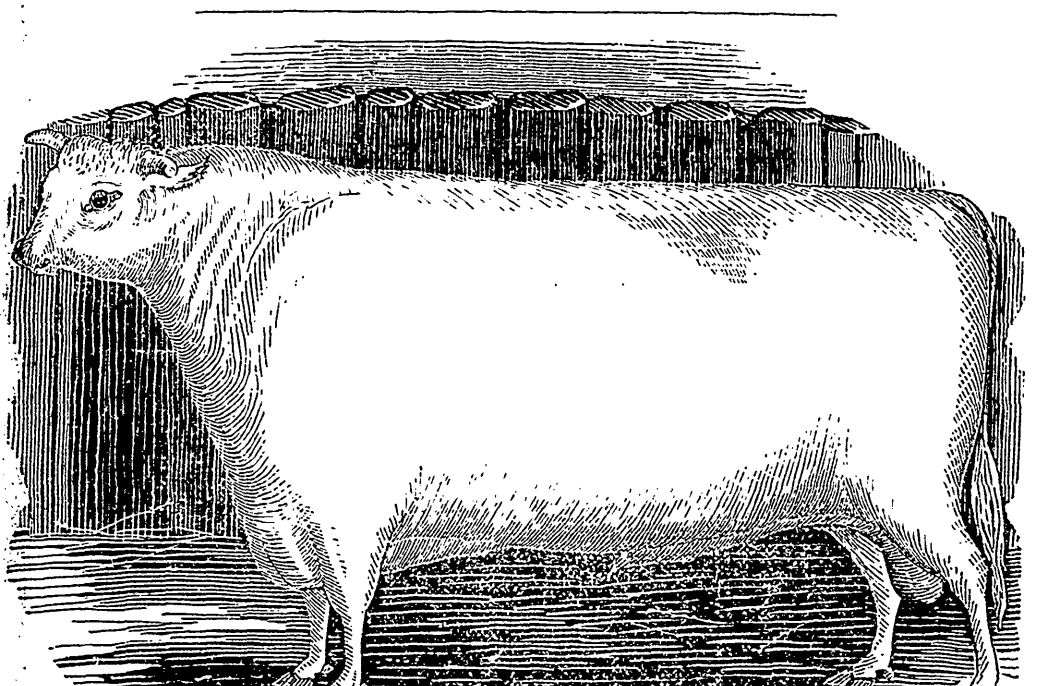
OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, FEBRUARY, 1852.

SMITHFIELD CLUB CATTLE SHOW.

In the last number of this Journal, we copied a Report of this great Exhibition which took place in December last. Perhaps it may not possess much interest for Canadian Agriculturists, but we inserted the Report in order to show what particular breeds of animals were most successful at the show. This will have a tendency to guide Canadian Agriculturists in selecting breeds of stock, and if it does, the Report will not be altogether useless. We have no doubt that this Report will be acceptable to many of the readers of this Journal, and we hope those who might think it useless here, may not object to its insertion, on the grounds we have stated. It is of great consequence to know what breeds of animals are most approved of after experimenting upon each in the most careful manner. Up to this time, very few useful experiments have been made in Canada to test the qualities of various breeds of stock, and consequently, we are quite in the dark as regards the comparative merit and value of each to the Agriculturist.



PRIZE SHORT-HORNED BULL, BAMBOO.

THE PROPERTY OF THE HON. A. F. NUGENT, PALLAS, TYNAGH.

Was awarded the First Prize of Thirty Sovereigns, as the best Bull in his class,; a First Class Medal, as best in his section; the GOLD MEDAL, as best of all Bulls; and the Purcell Challenge Cup, as the Best Beast in the Show-Yard. Calved January 18, 1847; bred by Exhibitor; got by the Beau of Killerby; dam by Windle; g. d. Beauty, by Monarch.

MUMMY WHEAT.

At the last meeting of the Directors of the Lower Canada Agricultural Society, on the 7th inst., one of the members, P. E. Leclere, Esq., who is also President of the County of St. Hyacinthe Agricultural Society, submitted for inspection three ears of wheat, which he had grown last year in his garden at St. Hyacinthe, from two grains of Mummy Wheat, which he obtained from New York, from a Mummy opened there, and stated that he had raised from the two grains over *two thousand* grains the first year. Mr. Leclere very generously distributed the grains of one ear to gentlemen present, and the remaining two ears are at the Society's Rooms for the inspection of any parties who may wish to see them. Mr. Leclere also left a bundle of the straw, which is remarkably strong, and perfectly free from rust. Here is another Canadian Agriculturalist who is making great improvements upon his property, and cannot fail to be an encouraging example to Canadian farmers generally. We should mention that the form of the ear of wheat is different from any we have seen, and is also different from what is known as the common Egyptian wheat. It does not appear to have suffered by the fly, and may prove a valuable variety for Canada. Since writing the above, we received the following letter from Mr. Leclere on the subject. Communications of this nature would give a greatly increased interest to this Journal, and it is much to be regretted that agriculturists would withhold information that would be useful to farmers, when it would be in their power to give such information through the columns of this Journal.

To the Editor of the Agricultural Journal.

My Dear Sir.—Late in the fall of 1849, I was fortunate enough to receive from a friend of mine, residing in New-York, about 30 grains of real Mummy Wheat. On the 15th of September, 1850, I sowed on a rich spot of land six grains of this wheat, two of which only came up. These two grains produced 41 ears, yielding altogether more than 2,000 grains; I have counted as many as 95 grains in a single ear. As to the quality of both wheat and straw reaped from these two grains of wheat, I must refer you to the samples left at our Society's Rooms as also at the Druggist Store of Messrs. Alfred Savage & Co., Notre Dame Street, Montreal. The wheat was completely ripe on the 9th of August last, on which day I had it cut. It was then more than six feet and a half in heighth. You will have perceived that the straw is unusually large, strong and free from rust.

I must, however, inform you that I have very little faith in the culture of fall wheat in Lower Canada, if I may judge two from attempts made by me, in 1842 and 1843, both of which proved total failures. In each of the above years the wheat was sown about the middle of September, on a piece of good land, well drained and exposed to the sun. In the following springs it looked beautiful and as healthy as possible, and continued so until about a fortnight or three weeks before coming to maturity, when, on both occasions, the two fields were, in a very few days, altogether destroyed by the rust.

I have not since attempted to sow any Upper Canada, or any other fall wheat on my farm until last fall, when I attempted, *on a very small scale*, the experiment above alluded to. This fall I have sown in my garden about two thousand grains of my new Mummy Wheat, reaped as stated on the 9th of August last, which looked very healthy when the snow covered the ground. Should these two thousand *children* prove to be as prolific as their *two ancestors*, I shall with pleasure treat a good number of my farmer friends, amongst which I have the honor to count you as one, with a few of their *progeny*. I shall, at all events, inform you of the result of this last experiment in due time.

Believe me, my dear Sir,
Yours very truly,
P. E. Leclere.

St. Hyacinthe, 20th January, 1852.

We have received another valuable communication from our highly respected correspondent, G. Marchand, Esq., of St. Johns, and we give it insertion with much satisfaction. This letter is the more valuable, from the plain straightforward manner in which it is written, and as we suppose the experiment was made some years back, probably previous to the appearance of the wheat-

fly, the land, if of fair quality, would yield fully the produce stated by Mr. Marchand, managed in a proper manner. We can well suppose from the value set upon dung by Mr. Marchand, that he must have given it a full supply when commencing the experiment, and if the quality of the soil was naturally good, the manner of treating it for the first crop, must have put it into the very best condition. Indeed it would not have produced such good crops for six years in succession, if the land had not been good, and in the best order. We would have thought it necessary, after producing three heavy crops of grain, to top-dress for the hay crops, to prevent the land from being too much exhausted, but its having yielded 300 bundles annually from one acre and a half, proves that it was not exhausted to the end of the six years, and the pasturing it the following three years, would have fully restored its fertility. We recommend Mr. Marchand's letter to the attention of agriculturists. There is very little doubt that the produce which Mr. Marchand obtained, could be realized from 100 acres, if the soil was good, and by the same management, with the exception, perhaps, of wheat. The winters are long certainly, and the summers short, but notwithstanding the shortness of the latter, an acre of good land will produce, under good management, as large a crop, with the exception of wheat, as land will do in more temperate climes, under ordinary management. Stock have to be fed from the produce of the land, and if the land produces in one year as much in Canada, as it will in Britain, no matter that it is the growth of three or four months, instead of eight or nine months.

The length of our winters is injuriously felt on account of its interruption of farm labor, because the farmer cannot employ the men he has in summer during the winter to any advantage. This is a great drawback, and deranges the business of the agriculturist. We are obliged to discharge some of the men who have worked for us during summer, and hence we have to employ new hands annually. and to teach them most of their work. This circumstance alone, nearly doubles the cost of every work of the farm, in consequence of the employment of new and inexperienced laborers, and even at this cost, the work will not be so well executed, as by men that would have worked several years with a farmer. In addition to this, the long winter causes much more work to remain for the working season. These are the greatest obstructions to farming in Canada, upon a large scale, but we conceive that it would be possible to mitigate these evils in a great degree, if not effectually to remedy them, by keeping a large proportion of live stock. The objections we have enumerated do not apply to moderate sized farms, or to those that are worked and managed by the farmer's own family. On moderate sized farms, the hands that are required for spring and summer, might be as usefully employed in winter, in threshing, attending to cattle, providing and carting manure, fire and fence wood, and many other small jobs. In the harvest, occasional hands may be had, who do not expect to be kept for the winter. As regards the prices of produce, we fear that we cannot expect the same that Mr. Marchand obtained for his wheat, nor perhaps for his barley, but the same prices he set down for oats and hay may be realized generally.

To the Editor of the Agricultural Journal.

My Dear Sir,—To convince you that I am a farmer by practice, I will hereunder subjoin a statement which will, in giving you a correct idea of the profits arising from high cultivation, at same time, give you an idea of the difficulty of cultivating on that plan on a large scale in this country.

Some years ago I covered one acre and a half of land with rich dung, giving it a good surface dressing, I ploughed it in in the fall, and I gave it clean and deep ditches, I reploughed it in the spring, and harrowed it well, I then sowed two bushels and a half of barley, the product was

seventy-nine bushels; in the fall I ploughed the same piece of land, and the spring following I sowed 2 bushels of bary wheat, the product was 45 bushels; I ploughed it again in the fall, and in the spring I sowed 3 bushels of oats with hay seed, the product was 67 bushels; after which it remained to hay 3 years, producing during the 3 years, about 900 bushels, making in all 6 years under cultivation and hay, after which it remained 3 years in pasture.

Here follows my account with said piece of and, *Dr.* one and a half acre of land for 6 years, cultivation as above, viz:—

To interest on £15 being the value of one acre and a half of land cleared, ditched, and its proportion of tare and wear of the building's utensils for 6 years,.....	£5	8	0
Drawing dung, paid the men,.....	1	2	0
Ploughing and Harrowing, do.,.....	1	5	0
Reaping and Housing, 3 times, do.,	1	10	0
Threshing and Cleaning grain,.....	2	10	0
Mowing and Housing Hay, ...	1	5	0
Grain and Hay Seed, and Ditching,...	2	0	0
	£15	0	0

Sold that year at					
By 79 B. Barley,.....	3s.	9d.,	£14	16	0
45 B. Wheat,.....	6	3	14	1	3
67 B. Oats,.....	1	8	5	11	8
900 Bls. Hay in the 3 years,.....	30	0	13	10	0
			47	18	11
Expenses,.....			15	0	0
			32	18	11
Use of Horses and my attendance,...			2	15	4
			30	3	7

Showing a profit of about five pounds per annum, equal to £3 6s. 10d. per acre.

You will by this statement see that a farm of 200 acres, 100 acres of which being alternatively cultivated in this manner, the remaining 100 acres being left for hay and pasture, would yield, provided the above prices could be obtained, a profit per annum, after paying interest, of £334 5s. 5½d., that would be paying the farmer well, besides paying him for his time, and the time of his cattle; but, as there may be a great reduction on the above prices, and as other casualities might reduce the profits, I shall say that without any doubt or question, such a plan of cultivation would insure one half of the above profits, say, £167 2s. 8d. per annum, on one hundred acres thus cultivated, and that on capital not exceeding two thousand pounds, the value of a farm of 200 acres cleared, ditched with all necessary buildings, being about £1 per acre.

But, Sir, the first obstacle to this high cultivation is the immense time lost in winter by the farmer in drawing wood, threshing, and going to market when at a distance; as to the threshing much time is now saved by the introduction of threshing mills, but the expense of threshing by the mills going round the country is too great it generally averages 9d. a bushel for wheat. I have, on account of this great expense, procured a single horse mill, and reduced the expense to 4d. a bushel and my own men do the threshing. The next obstacle is to procure manure in sufficient quantities, it could only be obtained in the vicinity of towns; you, perhaps, think that plaster of Paris, marl, lime, clay, and salt, will supply the want of dung, but from experience I can say that it will not, the effect of dung is general, whereas, the effect of plaster, lime, &c., &c., is partial, and very limited on some lands and on some crops plaster has no effect, but dung never fails if properly applied.

The third obstacle, and the greatest, which cannot be removed by human art, is the shortness of the summer season; to cultivate on such a plan, and on so large a scale, would require such a number of hands to perform the work in due time, that it would be hardly possible to procure them, and if they could be procured in a few instances in some localities, no man need, as yet, expect to profit by farming in this country on an extensive scale, unless he stands by and sees every iota of the work performed, and every hour of the time employed profitably.

If you think the above worthy of a place in your Journal, you may publish it when convenient.

Yours truly,

G. MARCHAND.

St. Johns, 27th January.

The letter of our friend, Mr. Davidson, of St. Foy, Quebec, will be found in our columns. No doubt it would be necessary that better regulations should be established for ploughing matches, and that particular

encouragement should be held out to bring the ploughs in most general use in the country without any exception to these matches. It is in a field of fair competition that implements will be fairly tested, and their merits, and defects made manifest. We disapprove of competitors at ploughing matches, taking a long time to plough the small portion of land assigned for them. It is absurd to take so much trouble and time to plough a small portion of land, and perhaps not plough an acre of land so well again during the ensuing year. Competitors at ploughing matches should be obliged to plough in ordinary time, and as it would be necessary for them to do on their own farms. The man who will prove himself to be the most useful ploughman, upon his own, or upon his employer's farm, should be awarded the premium, and not the man who may occupy double the time which any farmer can afford to devote to ploughing a given quantity of land. These men who do take a long time to finish their work at ploughing matches, often take the prize from much more useful ploughmen.

To the Editor of the Agricultural Journal.

Sir,—Your Journal, being an ever-flowing spring, where every farmer may dip and draw, without let or hindrance, I take the liberty to forward you the few following remarks on "Ploughing Matches," with which you will be at liberty to deal as you shall think proper and right.

The Lower Canada Agricultural Society have held *two* "Ploughing Matches during the past year, one in the District of Montreal, and one in the District of Quebec. The County of Quebec Agricultural Society has held *one*.

Though these are all intended for general good, and the improvement and encouragement of Agriculture, the manner in which the ploughing is generally done at these matches, especially in the District of Quebec, is very objectionable—the plough-irons are altered from their usual state, in order to set a good shoulder upon it, which makes the ploughing very laborious; and, as they are so fixed only to answer the present purpose; after the match is over they are fixed again as they are usually and for ordinary ploughing. As there is no scale given or settled upon, every one ploughs as he lists; some shallow, others deep, and others deeper still, which is a great fault in the managers. *These matches should be for "Model Ploughing,"* and performed in such a manner that a man could continue at work the whole day, and several days after, instead of having a mere sport for an hour or two, which exhausts himself and his cattle for the whole day. If proper regulations were insisted upon, and seals given, they only who paid the most attention to them in the performance of their work, should be entitled to prizes. I also conceive that it would be advantageous to all farmers to have a fair trial of "Ploughs." There are in Montreal Mr. Fleck and Mr. Jeffers, excellent "plough-makers;" and we have in Quebec Mr. D. Flemming and Mr. West, with several others. Why not give all those friends of agriculture, who provide the farmer with the necessary implements to extract the hidden treasures of the otherwise sleeping earth, "a fair chance," to contend, by fair experiments, "for excellence and superiority?" Such a "trial" would be the means of bringing out, or making known, "many hidden excellencies," which, peradventure, might supersede and excel all the *known ones*. If my suggestions are worth noticing, I would not *reject*, but *invite* "Wheel Ploughs" at the "Trial Match;" I have seen excellent ploughing done with them by many of our Canadian farmers (French Canadians.)

Leaving it to your superior judgment to reject or insert the preceding suggestions and remarks in your valuable "Journal," I conclude, by wishing you a happy New Year, with health and success.

MATTHEW DAVIDSON.

Ste. Foy, 10th January, 1852.

AGRICULTURAL SCHOOLS AND MODEL FARM.

We think it our duty to advocate constantly the establishment of Agricultural Schools and Model Farms, until we have such institutions, or until it is satisfactorily proved that they would not be useful to the country. We would not recommend that those establishments should be very large or expensive in the commencement until it would be ascertained how they would succeed. If land were pur-

chased for an Agricultural School and Model Farm, the improvement that must be produced on land managed as a Model Farm would prevent the possibility of loss by the land. Indeed we cannot see how a loss would be incurred if all was conducted upon a good plan, and under competent superintendence. The chief danger would be from extravagance in expenditure or incompetent superintendence. We must suppose of course that if an Agricultural School and Model Farm was established by public funds, there would be an unexceptionable plan fixed upon for everything connected with them. We advocate their establishment because we believe they would be very beneficial to the Agriculture of Lower Canada, but we should be very sorry to see them introduced unless conducted in every respect in an unexceptionable manner so as to insure their successful working. The land should be suitable for making experiments, the Farm-yard should be well arranged so as to be an example to all who would visit it; the live stock should be of the most approved varieties of pure breeds, with a few of mixed breeds for experiment, and the Implements should be the best that are made and in sufficient variety. These latter are some of the essential requisites to work out successfully and beneficially a Model Farm, established upon a judicious and perfect plan, and under competent superintendence; but we must defer our suggestions on Agricultural Schools.

AGRICULTURAL CLASS BOOK.

We gave an extract from this useful little book in the last June number of this Journal, on the properties of plants. We give now further extracts on earths and soils which will be found interesting, also, on the management of poultry. This latter article is written in a plain stile, intended for small farmers, but it is not the less valuable for its simplicity. Farmers may despise what they term "Book Farming," but we can assure them that those farmers who read works on Agriculture have a very great advantage over those who do not, whatever those who read or do not read may imagine to the contrary. If nothing had ever been published respecting other arts and manufactures, what would be their condition at this moment? And we state without any fear of contradiction, that Agricultural improvement would be a century behind what it is now, had there been no such thing as Agricultural publications for the study and instruction of sensible Agriculturists. Sensible men will never reject instruction in whatever way it is presented to them.

In making selections for this Journal, we cannot expect, that they will be in every particular, suitable instruction for Canadian Agriculturists. We shall, however, be very cautious not to give any selections that would be calculated to lead farmers into error. When an Agriculturist is able to read our selections, he can derive advantage from them, without adopting them exactly in his practice. We could not well cut them up and mangle them to suit farmers here exactly. It would be doing injustice to the authors of them, and were we to make any change we are almost certain that the alterations, however carefully made, would not give general satisfaction. Hence we think it better to leave them to the judgment of the reader. When we conceive that any particular explanation would be necessary, we shall endeavour to give our own views on the subject. Several of the selections may not be strictly agricultural, but while we carefully exclude political questions, and political news, there cannot be any harm in giving selections of an interesting or amusing character, although not agricultural.

We have received the January number of the "Canadian Agriculturist, and Transactions of the Board of Agriculture of Upper Canada," and we find it a very interesting number. It contains the Prize Essay "On Agriculture and its advantages as a Pursuit," by William Hutton, Belleville, which we had the pleasure of hearing read at the

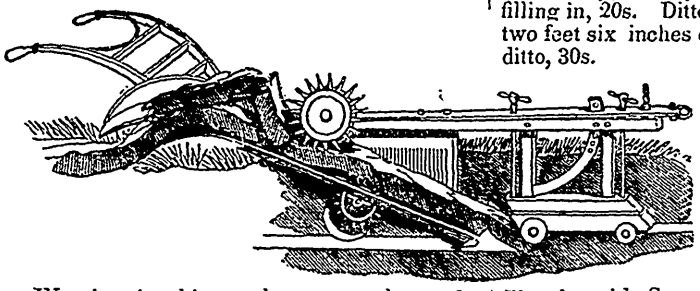
great Exhibition of the Society at Brockville, last September. Indeed, the Journal altogether is highly creditable to our respected friend, George Buckland, Esq., the editor, and we are convinced that under his management it will be a most useful publication to agriculturists, as well in Lower as in Upper Canada. It would afford us great satisfaction that the Canadian Agriculturist should circulate in Lower Canada, and that this Journal should not be shut out from Upper Canada. By these means, as Mr. Buckland observes, we would become better acquainted with the progress of agriculture in both sections of the Province, and with the steps taken for its amelioration. The Board of Agriculture in Upper Canada and the Lower Canada Agricultural Society, have the same objects, and were incorporated to promote by every possible means in their power the improvement of agriculture, and the general prosperity of tne rural population. It will greatly tend to the success of any measures these Societies may adopt, that they should act in concert, and maintain between them the most friendly understanding. Whenever the members of the two Societies meet at their Exhibitions or elsewhere on the business of Agriculture, it should be as members of one Canadian Society, acting for the public good. There should not be any exclusiveness between the Societies, who each obtain Grants of the public revenue for the accomplishment of the same object. There should not be anything like the feeling entertained, that "you are not of us, because you are not residing in this section of the province, and are not a subscribing member of this Society." The two Provincial Societies should act in perfect harmony in everything that relates to the duties they assumed when the Societies were organized. The improvement of agriculture will be more certainly promoted by the most friendly union and harmony between the two Provincial Societies, although, perhaps, the means necessary to be adopted for effecting this object in Lower Canada may not be exactly the same as those that would be suitable for Upper Canada.

CAPITAL.

We give in this number an extract from a Lecture on "What is Capital," delivered some time ago by Mr. Porter, of statistical notoriety. We do not object to his reasoning so far as it goes, but we are surprised that Mr. Porter seems to lose sight altogether of the real source of all capital, the produce of the Earth. It is absurd to talk of exchangeable values, without mentioning the first production that ever had any value. What would be the value of gold, silver, or precious stones, if it was not for the fruits and products of the soil, that may be given in exchange for them? In Mr. Porter's lecture on "What is Capital," we have not perceived any reference to agriculture, without which there could not be any such commodity in the world as Capital. Mr. Alison, in his excellent work, "The Principles of Population," says:—"What is capital but substance stored up, and what is the whole wealth of the world but the accumulation of the surplus produce of the labor of the cultivators of the earth in different ages, above what was requisite for their own support?" This has been the real source of capital, and those who now have capital, never could have had any, only for the surplus products of agriculture. Labor is capital under present circumstances, but there could not be either laborers or labor, if it were notfor the products of agriculture. It is the products of the Earth that must give life and activity to all things, and produce the capital that supports labor, manufactures, and ccommerce.

We know that it is quite a common mistake for many who are in possession of wealth to imagine that they have been the creators of capital, when probably they never created one penny in their whole lives. It is a different thing to *accumulate* capital created by others, and create it ourselves. No doubt the laborer or manufacturer who increases the value of raw materials by giving them new forms

and adapting them to more useful purposes, creates capital, or perhaps we should say augments the amount of capital already created, so also does the fisherman who takes fish from the waters, he increases the amount of disposable capital. The transport of commodities from where they are not wanted to where they may be required, will increase the selling value of these goods, but we cannot see how it creates any capital. The goods are not better than they were previously; although they may sell for a higher price. If our views on this subject be correct, it is easy to determine who are the creators of capital, and who are not.



We give in this number a wood-cut of a newly invented DRAINING PLOUGH, which we copy from one of our Exchange English papers, "The Farmers' Herald," published in Chester, a publication we value highly for its excellent selections. In a former number of this Journal, we gave a description of the plough, and the manner it worked. We now give the inventor, Mr. Robert Cotgreave's terms of letting the plough to make drains, which we consider very reasonable. We only wish that agriculturists could have the advantage of being able to hire such a plough in Canada for draining purposes:—

GREAT IMPROVEMENT IN LAND DRAINING.

Mr. Robert Cotgreave respectfully begs to inform the Nobility, Gentry, and Agriculturists generally, that he is now enabled to carry out the working of his recently invented Draining Plough. Underneath Mr. Cotgreave gives the Rates at which he will Drain strong Clay or Marl Soils, the necessary Pipes being deposited in the field for him.

Mr. Cotgreave is also prepared to Let out his Plough, with a proper person to superintend the working, and assist in cutting the main drains. The terms for Letting the Plough are also given.

Printed instructions for the use of the Implement will be supplied on application to Mr. Cotgreave.

Under 25 *Acres*—For Cutting Drains 20 in. deep, and 8 yds. apart, laying pipes, and filling in, 25s. Ditto two feet ditto 27s. Ditto two feet six inches ditto, 30s. Ditto three feet ditto, 35s.

Under 50 *Acres.*—For cutting Drains 20 in. deep, and 8 yds. apart, laying pipes, and filling in, 23s. Ditto two feet ditto, 25s. Ditto two feet six inches ditto, 28s. Ditto three feet ditto, 33s.

Under 100 *Acres.*—For cutting Drains 20 in. deep, and 8 yds apart, laying pipes, and filling in, 21s. Ditto two feet ditto, 23s. Ditto two feet six inches ditto, 26s. Ditto three feet ditto, 31s.

200 *Acres and upwards.*—For cutting Drains 20 in. deep, and 8 yds. apart, laying pipes, and filling in, 20s. Ditto two feet ditto, 22s. Ditto two feet six inches ditto, 25s. Ditto three feet ditto, 30s.

Other depths to be specially contracted for.

N.B.—In case four horses and one man are supplied, an allowance of 5s. to 10s. per acre, having regard to the depth and quantity, will be made.

Terms for letting out the Plough, with Superintendent—in all cases the man to be paid weekly, 12s. per week.

For any quantity of land amounting to 50 acres and upwards, for 20 in. deep, 5s. Ditto ditto for 2 feet deep, 6s. Ditto ditto for 2 feet 6 inches deep, 7s. Ditto ditto for 3 feet deep, 8s.

The Rake, Eccleston, near Chester.

ILLUSTRATIONS.

We give a few illustrations in the present number and expect to be able to continue them. Those of animals, are copied very accurately from the Irish Farmer's Gazette, and may be relied upon as exact representations. When we give illustrations, we shall take care that they are not caricatures but representations of well formed animals. We are sorry it is not in our power to give likenesses of animals we have in Canada, but we would not attempt to take copies of animals exhibited in the British Isles, and show them off in this Journal as stock belonging to parties on this side the Atlantic, as practiced in other periodicals. We know that in Upper Canada, they have very superior

stock, and if we had artists who would give exact pictures of them, we should be proud to have them as illustrations for this Journal, and give their owners the full credit of possessing such superior stock. From whatever drawing or originals illustrations are taken, none should ever appear in an Agricultural periodical, unless they are representations of perfect animals of the species or variety to which they belong. There is no use in illustrations of imperfect animals, we can see them in the fields every day. The principle benefit of illustrations is to show those who may not have an opportunity of inspecting them personally, what sort of animals are most approved of at Great Exhibitions when the best of every species and variety are brought together in fair competition. We shall take care that our pictures of live stock shall not be any discredit to the character of this Journal.

It is of great importance that Farm-yards, and buildings should be judiciously and conveniently arranged. The attendance on live stock, and every work to be executed about the buildings, can be done with much greater ease and facility, when the buildings are upon a proper plan, than when they are scattered about without order or arrangement, and perhaps the latter mode of building would cost more than a perfect plan would do. They should, if possible, be formed in a square to afford shelter to the live stock when out, shelter to the buildings, and better covering to the manure. In this country where there is so much snow in winter, it gives a great deal of trouble to have the buildings scattered about, both the manure and land is wasted, and it has a very slovenly appearance. When there is a well arranged square, with buildings in proportion to the requirements for them, (but not to exceed this) the snow can be easily taken from the yard occasionally, and not allowed to be too much mixed up with the manure or be an annoyance to the stock. Over-building should be carefully avoided, and it would be better to forego some barn room, and stack some of the hay and grain in a stack-yard, than have numerous buildings that require a large outlay to keep them in good repair. Where stone or brick can be had at a moderate price, (or when the farmer could make sun-dried brick that would answer well) they should be preferred for building to making use of wood, particularly if the farmer's means will admit of the additional outlay that might be incurred, though we have some doubts that there would be any additional outlay required. Stones are frequently to be had conveniently, and where they are not, farmers might unite together and make either burned or sun-dried brick at a very cheap rate. We have seen good houses built of sun-dried brick in Upper Canada, and by having a stone course for the foundation, we are certain they would answer well in Lower Canada. They would be warmer, more lasting, and look better if whitewashed, than wood. It is the opinion of some parties that there is less danger from fire where the farm buildings are not connected, than where they are so. This may be true in some cases, but we have seen scattered buildings, that we conceive to be much more dangerous for fire, than if they were regularly connected. Where proper care is observed and glass lamps made use of, there is not much danger of fire, and at all events, no farmer should have his establishment uninsured, when he can have it effected at moderate rates by country Mutual Insurance offices. Before erecting farm buildings, for those who have the means, it would be well to obtain a plan from a competent person, and to take time to consider it well. The expense of having a plan, will be much more than compensated for, though it might not be exactly followed. When the plan is before us, we may see defects, and make corrections that we might not perceive if we had not the plan. A competent person will give the true principles of buildings, that unprofessional men do not understand unless very rarely, though the latter may make useful improvements upon them. The most substantial, best arranged, and

most convenient farm buildings we have seen in Canada are those of Major Campbell, of St. Hilaire, they are all of stone and brick covered with tin. We freely admit that few farmers might be able or disposed to build in the same style; but we are convinced that any farmer, though he should not have one hundred pounds currency to expend on buildings, might take a useful lesson from seeing that establishment. Every arrangement is most judicious and convenient, indeed we may say, faultless. There are both stalls and boxes for cattle feeding, and the cattle stalls are kept perfectly clean. The sheep-houses, piggeries, and fowl houses, are all exceedingly well contrived, and so arranged that there is comparatively no trouble in feeding and attendance upon the stock. The stables and cattle houses are sufficiently lit and ventilated, there are drains and tanks for saving the liquid manure, and the dung is under cover until removed to the fields. The expenditure is that of a wealthy proprietor certainly, but it has the merit of being most judiciously employed upon his Domain in the country, in the midst of his Seigniory, and is a most convincing proof of his high estimation of agriculture, and of his appreciation of Lower Canada as an agricultural country, and hence Major Campbell's patriotic and liberal expenditure in this instance cannot fail to act as an encouragement to men of wealth and station, to come and settle in the country and follow his example. Who will pretend to say that Major Campbell's expenditure in the country will not have a much more favorable influence upon the improvement and prosperity of Canada than if he had expended the same amount in building fine houses in Montreal, and making his residence there. His usefulness in the country is not alone confined to his superior farm-yard and buildings, but to his excellent system of husbandry, which any farmer may take example by; and we can tell "practical working farmers" that there is not one of them more attentive to every work in progress upon the establishment than Major Campbell is constantly. We hope we may not give offence by introducing this gentleman's name, as we have done so unauthorized. Our sole motive in doing so, is to advance the improvement of agriculture by pointing out a good example. We view Major Campbell's conduct as calculated to do great credit to Agriculture, by identifying himself with it, and embarking a large capital in the business. And, in conclusion, we beg to say, that gentlemen coming to this country with property, will do more for the advancement of the prosperity of Canada, and perhaps ultimately of their own prosperity, by settling in the country, as Major Campbell has done, than by expending their capital in Town. Disappointments, and many disagreeables may occasionally occur to gentlemen settling in the country, but these disappointments often result from causes not brought on by any unfavorableness of the country, but by mistakes committed by the parties. Many gentlemen have succeeded in the country, and this is sufficient proof that success is perfectly attainable by adopting the proper course.

We received the communication of "A Friend of Agriculture," relative to the reported appointment by the Governor of a "Minister of Agriculture" for Canada. As there cannot be any doubt of its political tendency, and that it would be interpreted in that way, we cannot give it insertion. We have no objection to advocate measures that we may conceive to be advantageous to Agriculture, but this communication having reference to a Ministerial appointment is inadmissible. There is not any Law passed for the appointment that we are aware of.

AGRICULTURAL REPORT FOR JANUARY, 1852.

The first day of the new year was beautifully fine, but the greater part of the month was excessively cold, even for a Canadian winter. The Thermometer was frequently, and for several days together, many degrees below zero, and on more than one occasion was as low as twenty degrees below zero. On the 25th and 26th, however, we had a

thaw, which lessened the snow considerably, but it changed to frost again on the night of the 26th. We would not consider it favorable to have the snow disappear until the winter was fairly over, or until the latter end of March. It is only reasonable that we should wish for an early spring, but it would not be for the advantage of farmers that the snow should disappear long before we had fine spring weather. About the 1st of April is the best time for the land to be in working order, as it gives a fair chance to have the spring work done in proper time. If we have much fine weather before this, we generally have to endure cold and unfavorable weather at a later period. However the remainder of the winter may turn out, the part that is passed has been very severe.

Nothwithstanding the very cold winter, hay is very low priced in the market, indeed so low, as not to afford any remuneration to the farmer for his land, and yet he must pay as high a charge for weighing as if he got as many dollars as he does shillings for his load of hay. The price of wheat also, is not remunerative, unless where the produce per acre was large, which it certainly was not generally the last year. Barley, peas, and oats continue to bring fair prices, and it is much to be regretted that we had not more of the former grain last year. Potatoes are at moderate rates, considering how much the crop suffered by disease previous to, and subsequent to their being stored. We do not hear many complaints of rotting lately, and we suppose that potatoes that did not rot immediately after they were stored, have kept better than for some years past. These casualities to which some crops are subject will produce one good effect, that it will cause farmers to study their business and endeavour to understand it more perfectly. We feel persuaded that there is no evil without a remedy, provided we use sufficient diligence to discover what the remedy is. It might also be well to endeavour, if possible, to discover what has produced the evil. Already farmers have been enabled to mitigate in some degree the potatoe disease, by experiments, by careful management, and planting such varieties as are found best to resist the disease. We are glad to be able to report that many agriculturalists are now saving clover and other agricultural seeds, a branch of farming that was altogether neglected heretofore in Lower Canada. All that is required is to have the land clean, so that the seeds of whatever kind shall not be mixed with seeds of weeds. We have no doubt but farmers who do not raise their own Timothy seed have introduced pernicious weeds upon their farms, that otherwise would not be there, particular by the ox-eye daisy, one of the worst weeds we know in the country.

In this way, and by the use of fresh manure taken from towns, without fermenting to a proper degree, weeds are brought to farms that had not them previously, or at least new varieties are brought. We have trouble enough to keep down weeds that grow naturally, without sowing the seeds of them in our lands. A farmer cannot be too cautious in having the seed that he sows, of whatever description, perfectly clean.

This month of January may be said to be one of the most inactive months of the year for agriculture, and we are at a loss for matter to make out an Agricultural Report. Stall feeding cattle is not carried on to any great extent, but we hope this branch of farming will increase every year. We have seen a report of a very interesting discussion on this subject, before the Highland and Agricultural Society of Scotland, as to the best mode of feeding, and the breed of cattle that will pay best for feeding. We shall give extracts from it in a future number. Professor Anderson stated that this particular branch of husbandry owed much to scientific men, for their discoveries and suggestions. We say that agriculture in every branch, is indebted to scientific men for most of the recent improvements that have been

introduced. Sensible, practical farmers have worked out experiments suggested by men of science, but doubtless the latter have generally been the first to suggest some of the most advantageous improvements that farmers have adopted during the last few years. This comparatively idle season is the proper period for farmers to read, and endeavor to obtain a more thorough knowledge of the science and art of agriculture; and we can assure them that they never can read or learn too much about it. We do not say but they may read some on the subject that will not be very instructive, but nevertheless, there is scarcely any agricultural work published that will not afford them useful information. Publications upon any other subject frequently contains a large proportion of matter not interesting, and it is unreasonable for us to expect that publications on agriculture should not also contain some matter not particularly instructive to farmers. We conclude, by wishing agriculturists as favorable and prosperous a year as it is possible for them to desire. We may always hope that our products will be in proportion to the skill and attention we give to our lands, our live stock, and our crops. This will certainly be the case under ordinary circumstances, but of course we are constantly liable to adverse seasons and other casualities, that it is almost impossible to guard against, but fortunately adverse seasons are only of rare occurance.

MUSEUM OF ECONOMIC BOTANY.

We are given to understand that one of the immediate results of the great Exhibition is to be the establishment of a Museum of Economic Botany at the Royal Gardens at Kew. This has been approved of by the authorities, and Sir William Hooker, the Director of the Kew Gardens, is now engaged in the initiatory steps for its immediate formation, under the direction of her Majesty's Commissioners of Woods and Forests. The object of this institution which has been thus happily conceived, is to bring together and exhibit such interesting products from all parts of the world as cannot be shown in the living plants of a garden, nor in the preserved ones of an herbarium. In this way it is intended to collect and arrange in the new museum, such fruits and seeds as are deserving of notice, especially those which are of large size, or possess any peculiarity of form or structure. All flowers and plants which, from their make, are unsuited to the *Hortus Siccus*, and which may require preservation in spirits of acid, specimens of wood used in commerce, or which would appear to be deserving of notice from their beauty, hardness, &c., will come within the range of the collection, and impart to it a most practical and interesting character. In the same way will be added gums and resins, especially these employed in the arts or in domestic economy, also dye stuffs, of which very few are as yet known to science. Another most important branch of the collection, will be the medicinal substances, which in the various shapes of seeds, leaves, gums, oils, roots, &c., exist in unknown extent throughout the east. The medical practice of India, mixed up though it be with a great deal of priestcraft and jugglery, is not without some claim to the attention of men of science; for, in those countries, diseases which but too frequently defy the skill and chemicals of our medical men, yield to the treatment of native practitioners. Besides the above, there are miscellaneous objects of a more general and commercial character, many of which, although well known in their consumable shape, might with advantage be shown in their several preparatory stages, or in different degrees of quality. In this way specimens of chocolate and cocoa might be placed side by side of the large bean fruit, to show that both are the products of the same seed. Coffee, too, might with advantage be exhibited in all its various stages, and they are many, from the beautifully-clustering cherry-like fruit to the parchment-covered bean, and finally to the cured and picked berry as shipped to this country for consumption. The products of the cocoa palm tree would prove highly interesting if grouped together, for very few in this country, even amongst our scientific men, are aware of the multitude of useful and ornamental articles yielded by this wonderful tree of the east; the principal of these are sugar, spirits, vinegar, toddy, medicine, oil, rope, matting, bagging, thatch, furniture of all sorts, ornaments, drinking vessels, building materials, canoes, fishing-nets, and many others.

Active steps are being taken by the colonial authorities to secure the co-operation of governors of colonies, managers of botanic gardens abroad, travellers, merchants, and others.

We may here mention that any parcels or packages will be brought from abroad free of charge by any of her Majesty's ships, or by the royal mail vessels, or Peninsular and Oriental Company's steamers; in those cases they should be addressed—"On Her Majesty's Service—for the Royal Gardens, Kew." To the secretary of the Admiralty, London." Packages coming by merchant vessels or by private hands may be addresssed to Sir William J. Hooker, Director, Royal Gardens, Kew, London.—*Globe.*

PLOUGHING BY STEAM.

We had on Friday an opportunity of witnessing a very successful application of steam power to the ploughing of land—a locomotive plough, invented by Mr. James Usher, brewer, having been set in motion on a large field on the farm of Bankholm, Inverleith. A model of the invention was shown in the Great Exhibition, but this was the first experiment on a scale sufficient to test the merits of the invention.

The steam plough might, at a little distance, be taken for a railway engine without its tender; but it moves in the reverse direction, and the revolving ploughshares are placed immediately behind the funnel. The adaptation of propulsive power to the machine renders it different from most other steam-ploughs that have hitherto been invented—the system of endless chains and stationary engines having been the plan generally adopted heretofore. The machine of Mr. Usher is therefore much more simple and manageable, and more capable of application to irregularly marched fields, while the superficies of ground traversed will be at least as great.

"The invention consists," to borrow the description given by the patentee, "firstly, in mounting a series of ploughs in the same plane around an axis, so that the ploughs shall successively come into action; and secondly, in applying power to give rotary motion to a series of ploughs, or other instruments for tilling the earth, so that the resistance of the earth to the ploughs or instruments, as they enter and travel through the earth, shall cause the machine to be propelled; thus making the plough act in the earth in the same way as paddle-wheels do in the water, by which the vessel is moved along, and the resistance of the earth being greater than the water, the power obtained is proportionally more. * * * * Not only the ploughs, which are set in the same plane around the axis, follow each other into action, but the ploughs of the other sets (which are affixed around the axis in parallel planes) are arranged and come into action, so that two ploughshares will not strike the earth at the same instant."

The locomotive exhibited was of ten-horse power, and although only four ploughs were affixed to it, it is adapted for working six, and might be made capable of working eight or even ten, without increase of power. Of course the amount of power that might be introduced into the locomotive is indefinite, and the series of ploughs might be made to compass any proportionate breadth of land; but perhaps the most manageable scale was that on which the invention was exhibited, with the addition of two more ploughs, for which it was intended but which had not been prepared in time. The depth to which the ploughshares penetrated the soil was from seven to nine inches, something more than that of the horse-plough; while, instead of the regular and orderly furrows we are accustomed to see, the loam was torn up as loosely as garden mould. With a few improvements on the mechanism, the locomotive will be able to turn and move about, so as to turn up every inch of the soil, it being at present defective in various details, which could only be discovered by experiment. The field on which it was tried was level, but the steam-plough could, it is supposed, accomplish gradients of 15 in 100; and, although there are circumstances in which it could not be brought into action, Mr Usher has little doubt that the greater part of the arable land of the country might be cultivated by the agency of steam.

The ground traversed could not be strictly computed, from the experimental nature of yesterday's proceedings; but allowing the steam plough to go at double the rate of a horse plough, which several practical gentlemen present estimated to be its space, and to drive six ploughs at once, and only occupy two skilled men instead of twelve laborers comparatively unskilled, some idea may be formed of the saving which it would effect to agriculturists. The cost of a locomotive plough would be 400*l.* or 500*l.*; but were it brought into general requisition, it would more probably be hired than kept by farmers.

What the effects of the general application of steam to agricultural purposes might be, it would be premature to speculate. That powerful agency has caused a revolution in many handicraft trades, and may be destined to innovate on rural as well as on urban occupations. The feasibility of the invention was admitted by all who saw it, and it was also evident that the principle had reached a very considerable extent of practical development, and that, while several palpable defects could be readily removed, new and most important capabilities might still be added. In one of the experiments, a harrow was attached to the ploughing machine, and it was suggested that were a broadcast sowing machine added, and another harrow perhaps, to bring up the rear, the whole work of spring might be thus accomplished at once.

About forty or fifty gentlemen, many of whom were practical agriculturists, were present, and among others were Mr. Hall Maxwell, the secretary, and several members of the Highland and Agricultural Society, who seemed highly interested and pleased with the invention.—*Edinburgh Courant.*

ECONOMY IN DRAINING.

Agriculturists from other countries who visited the late Great Exhibition, availing themselves of the opportunity of a tour through England, were astonished at the luxuriant crops which were to be found in districts where drainage had been effectively executed, and improved modes of culture adopted; and they failed not, on their return to their native land, to make known the secret of the success of the British farmer, that the foundation of all improvements was drainage. We hope the period is not far distant when there will not be an acre of land in cultivation undrained in the United Kingdom.

The owners of the soil cannot invest their capital in a more secure and ultimately profitable enterprise than the drainage of their estate; but the present period requires—when the price of agricultural produce and rents are considerably reduced,—that in any outlay for the improvements of the land, that it should be done with economy, at the same time efficiently.

We invite attention to the very able pamphlet on drainage, written by Mr. Hewitt Davies, in reply to Lord Wharncliffe's paper in the Royal Agricultural Society's Journal. The subject is well investigated by both writers, and should be perused by those who intend carrying out the system of draining in the most approved mode.

We have occasionally referred to the new and economical invention of draining as practiced

by Mr. Cotgreave, of the Rake farm, near Chester. On the 20th ult. there was a public exhibition of the operations of drainage by the plough, on a field in his own neighborhood, in the presence of several noblemen and agriculturists, who expressed themselves satisfied as to the utility of the invention, and from whom the patentee received commissions to execute work, which we hope will in some measure compensate him for his outlay in carrying out the system to its present perfection.

The field on which the operations were carried on is a large grass piece, with a retentive clay substratum. He prepared drains, in the first instance, on the average, 2 feet 6 inches in every grade, from taking off the first clod to having the drain completed by filling up. There were some practical men present who were astonished at the despatch which the implement excavated the soil, and prepared it with such uniformity for the titles, which were quickly laid down, and the whole completed with the approval of the visitors.

We are glad, however, to find that Mr. Cotgreave's services have not been confined to his own immediate locality, but that he has recently been employed in draining estates in the neighborhood of London and several other districts.

Powerful Manure.—A native of "Down East" describing with characteristic exaggeration the remarkable properties of guano as a promoter of vegetation, said that a few hours after planting cucumber-seed, the dirt began to fly, the vines came up like a streak, and although he started off at the top of his speed, the vines overtook him and covered him, and taking out his knife to cut the plaguy things off, he found a large cucumber gone to seed in his pockets. That will do to laugh over.—

The Royal Baron of Beef.—This noble old English joint was brought into the royal kitchen at Windsor Castle, on Tuesday; the process of roasting commenced at 11 o'clock on the morning of that day, and was not completed before eleven o'clock at night. The baron, cut from a handsome Devon ox, was supplied by Mr. Minton, the royal butcher at Windsor; it weighed 430lbs., and was placed cold on a side table at the Royal Banquet on Christmas Day. The fellow ox was bought by Mr. Minton, with other choice beasts to be slaughtered this Christmas; but its symmetrical points being so very perfect, it was purchased by General Wemyss for his Royal Highness Prince Albert, and sent to the Flemish farm, for the purpose of being fed for the cattle show of next year.

Ease for Man.—By the year two thousand, says an American paper, it is probable that manual labor will have utterly ceased under the sun, and the occupation of the adjective "hard fisted" will have gone for ever. They have now in New Hampshire a potato-digging machine which, drawn by horses down the rows, digs the potatoes, separates them from the dirt, and loads them up into the cart, while the farmer walks alongside, whistling "Hail, Columbia!" with his hands in his pockets.—*The Builder.*

Beet-Root Sugar in France.—The *Moniteur* publishes the returns of the produce and consumption of beet-root sugar since the beginning of the season, from which it appears that, on the 1st of December, there were 322 manufactories in operation, or 23 more than in the corresponding period of 1850. The quantity of sugar manufactured, including the portion lying over since last year, amounted to 19,635,386 kilogrammes, and that stored in the public bonding warehouses to 10,556,847.

An Egyptian Model Farm.—Among the passengers who went out in the Ripon, which left Southamptou on Saturday with the Indian mail was Mr. Le Mille, the English farm bailiff of the Pacha of Egypt. He took out a number of cows and pigs, a large quantity of poultry, pheasants, &c., to stock Abbas Pacha's farm. The farm, which is to be cultivated as much as possible after the English fashion, is 3,000 acres in extent. The cows taken out in the Ripon were of the Alderney breed, and the pigs and poultry were of the finest sorts that could be obtained in England. A large quantity of live farming stock is still to be sent to Egypt from this country, to complete the Pacha's arrangements. Mr. Page, the nurseryman, of Southampton, who is well known as a skilful judge of animals, selected the Pacha's farm stock, and had its superintendence while in Southampton.

He who has merited friends will seldom be without them, for attachment, is not so rare as the desert which attracts and secures it.

He that buys a house ready wrought has many a pin and nail for nought.

SONGS FROM AN UNPUBLISHED OPERA.

OH! PLEASANT HOURS.

Oh! pleasant hours, fly not, fly not,
Stay with me yet awhile;
I pray ye, let me for a space
Bask in your sunny smile.
Old time hath wings—his lessons grave,
His threats are all forgot;
Bright shines the sun, bright gleams the wave;
Sweet hours, fly not, fly not.
Oh! pleasant hours, stay yet, stay yet;
For coming time must bring
Full many a cloud to shade our lot,
Upon his restless wing—
Deep grief perchance for loved and lost,
And care, and vain regret,
With darkened skies and stormy seas:
Sweet hours, stay yet! stay yet!

Ellen C.

AN OLD SAW ABOUT CHRISTMAS.

If Christmas day on Thursday be
A windy winter you shall see;
Windy weather in each week,
And hard tempests, strong and thick.
The summer shall be good and dry,
Corn and beasts shall multiply;
That year is good lands for to till;
Kings and princes shall die by skill.
If a child that day born should be,
It shall happen right well for thee—
Of deeds he shall be good and stable,
Wise of speech and reasonable.
Whoso that day goes thieving about,
He shall be punished without doubt;
And if sickness that day betide,
It shall quickly from thee glide.

CREAM CHEESES.—Take your cream (a quart), tie it in your salted linen cloth, giving it as much room inside as the size of your cloth will allow, and then bury it in moist river or sea sand which has been thoroughly washed; if this is done over night, the capillary attraction of the sand will have carried off the whole of the whey by next morning, and you will have a cream cheese almost impromptu. If your cream is not very good, or if you use half milk, the precaution must be taken of mixing the milk and cream some days previously, stirring it and keeping it in a warm room to give it consistency, otherwise it will almost all escape through the cloth.—*Clitheroe.*

Plaster for Burns, Scalds &c.—To two ounces of Burgundy pitch and half-an-ounce of bees wax slowly melted together, add an ounce and-a-half of lard, to render the compound sufficiently soft but *not* so soft as to melt with the warmth of the flesh. Instead of lard, fresh butter, or oil may be used. Let this salve be spread upon *old nankeen*, or any other *fine, close, soft cloth.* Leather is apt to become hard on drying after any moisture getting to it. The plaster may be fitted to any part that is injured, by putting it on in as many pieces as the shape of the wound requires, for (the salve being of a proper consistency,) the pieces will adhere to each other and effectually exclude the *air*, the common enemy of all raw flesh. It is necessary to place a compress of soft cloth over the plaster to keep it in its place, for the *least wrinkle* will admit the air, and cause smarting and inflammation. Then bandage it close, so that it cannot get out of place. The bandage and compress should be carefully taken off in the course of eight, ten or twelve hours in order to pierce (through the plaster) with a large needle any blisters which may have arisen, after which gently press down the plaster, and carefully bind the compress up again. But by no means attempt to remove the plaster under three or four days, and then with great care, so as not to remove or disturb the skin. When it becomes necessary to dress the sore, wipe the parts round it; but by no means disturb the mucus on the raw parts. Wipe and dry the plaster as quickly as possible, and with a hot knife smooth it over, adding more salve when necessary.

Observation.—No lint to be used at any time, and let it be remembered, that two things are essentially necessary to the *cure of wounds* occasioned by burning or scalding, or any external injury, viz.:—*Rest* and a complete protection from the *air*.

For a Cough.—Take a tea-cupful of linseed. Two ounces of *stick* liquorice sliced, and two ounces of sun raisins, put them into two quarts of soft water, and simmer over a slow fire till reduced nearly one-half, then strain off and add while yet hot, two ounces of brown sugar-candy pounded. Drink about half-a-pint, a little warmed on going to bed, and again in the morning, and at any time when the cough may be troublesome.

SLOW AND SURE.—If men were content to grow rich somewhat more slowly, they would grow rich more surely. If they would use their capital within reasonable limits, and transact with it only so much business as it could fairly control, they would be far less liable to lose it. Excessive profits always involve the liability of great risks; as in a lottery in which there are high prizes, there must be a great proportion of blanks.

DIAMOND DUST.

(FROM ELIZA COOK'S JOURNAL.)

Nature makes us poor only when we want necessaries, but custom gives the name of poverty to the want of superfluities.

He who indulges his sense in any excesses renders himself obnoxious to his own reason, and, to gratify the *brute* in him, displeases the *man*, and sets his two natures at variance.

Whatever is, is right, if only men are bent to make it so, by comprehending and fulfilling its design.

To become an able man in any profession whatever, three things are necessary—nature, study, and practice.

The virtue of prosperity is temperance; the virtue of adversity is fortitude.

The love of which men *sing* is with women an eternal truth.

The best of all good things is a good example, for it is the maker and multiplier of good.

In the country of the blind the one-eyed is a king.

The silence of a person who loves to praise is censure sufficiently severe.

The ecstacy of delight, like the intensity of pain, makes one stern and serious.

(*For the Agricultural Journal.*)

METEOROLOGICAL RESULTS FOR DECEMBER 1851, MADE AT ST. MARTIN, ISLE JESUS C. E.

(BY CHARLES SMALLWOOD, M. D.)

DECEMBER.

Barometer.

	Inches.
Mean Reading of the Barometer corrected and reduced to 32°.....F	29.647
Highest reading the 27th day,.....	30.314
Lowest do. do. 20th day,.....	28.977
Monthly range.....	1.337

Thermometer.

Mean Reading of the Standard Thermometer.....F..x	14°8
Highest reading of the Maximum Thermometer, 30th day,.....x	41°0
Lowest reading of the Minimum Thermometer, 26th day (below Zero).....	30°0
Monthly range,.....	71°0
Amount of Snow, during the month, inches	13,860
Rain, do do inches	1,200
Snow fell in six days.....	
Rain fell in four days.....	
Most prevalent wind,.....	W
Least do. do.	SSE
Most windy day the 15th day, mean miles per hour,.....	15,34
Least windy day the 6th day, mean miles per hour,.....	0,06

NOTICE.

A GENERAL MEETING of the Members of the Lower Canada Agricultural Society, is to take place at the residence of A. Pinsonnault, Esq., Great St. James Street, opposite the People's Bank, on TUESDAY the 10th day of February next, at 11 o'clock, A. M.

By Order,
W. EVANS,
Sec. and Trea. L. C. A. S.

Montreal, 26th January, 1852.

PROVINCIAL MUTUAL AND GENERAL INSURANCE COMPANY.

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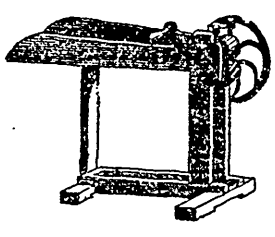

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103, St. Paul Street

Montreal, 1st April, 1851.

LOWER CANADA AGRICULTURAL SOCIETY,

Office and Library at No. 25 Notre Dame Street, Montreal,

Over the seed-store of Mr. George Sheppard, the seedsman of this Society,

THE Secretary and Treasurer of the Society is in attendance daily, from ten to one o'clock.

The Library has already some of the best works on Agriculture. Also, the Transactions of the Highland and Royal Irish Agricultural Societies, the London Farmer's Magazine, the Transactions of the New York State Agricultural Society, and many other British and American Agricultural Periodicals which are regularly received. The Agricultural Journal and Transactions of the Lower Canada Agricultural Society, both in English and French are to be had at the office from the commencement in 1848, up to the present.

All communication in reference to the Agricultural Journals from the first of January, instant, to be addressed post-paid to Wm. Evans, Esq., Secretary of the L. C. A. S. and Editor of the Agricultural Journals.

Members of the Lower Canada Agricultural Society are respectfully requested to pay up their annual subscriptions immediately.

WM. EVANS,
Secretary and Treasurer, L. C. A. S.

1st January, 1852.

Copies of Evans' Treatise on Agriculture, and the supplementary volumes both in English and French to be had at the office of the Society with complete files of the Lower Canada Agricultural Journal for the years 1844, 1845 and 1846.

MATTHEW MOODY,

MANUFACTURER OF

THRESHING MACHINES, REAPING MACHINES, STUMP AND STONE EXTRACTORS, ROOT CUTTERS, REVOLVING AND CAST-STEEL HORSE RAKES, PATENT CHURNS, WAGGONS, &c. &c. &c.

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Threshing Mills repaired, and finishing work done.

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