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# AGRICULTURAL JOURNAL,

AND

# TRANSACTIONS

OF THE

# Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, APRIL, 1880.

NO. 4.

We have very frequently endeavoured to show the unreasonableness of objecting to "Book Farming," if what is proposed to us in books is reasonable. There is much, certainly, to be found in some agricultural works that may not be practicable or practical, but this is no good reason that we should reject any sound and practical information or useful suggestions, because they are submitted to us in a printed form. We should not know what to think of a farmer who would reject useful information or suggestions he would see in a book or periodical, on the absurd grounds that he had not seen the practice recommended, suggested or proposed, in operation. How or when are we to expect to see the necessary improvements introduced in Canadian husbandry, if we are to wait until there is a Model Farm established in every parish to show these improvements in actual practice? By all means farmers should reject any plans of improvement proposed to them, either in books, periodicals, or otherwise, if they should have reason to believe that what was proposed would be impracticable or unprofitable; but by the same rule they should willingly adopt any reasonable proposition of amelioration that was in their power, whether proposed to them in a book, periodical, or in any other way. There may be agricultural works published, and periodicals conducted by parties who are not practically acquainted with their subject, but this is not always the case, and therefore farmers will act very much against their own interest when they reject all they see in agricultural books or periodicals.

In conducting this Journal, we frequently, or we might say constantly, go into lengthened explanations of any change of system or plans of improvement we submit, in order to show farmers the grounds upon which we make our propositions, to prove to them the defects that exist in their practice, and the probability of the favourable results that would ensue from adopting the changes we propose to them. We acknowledge we do this, in order to gain their confidence in our humble exertions for their advantage. We know that this confidence is necessary to the success of this Journal, and to the introduction of the plans of improvement we may suggest from time to time. If we should happen to propose or suggest any changes in our agricultural system or practice that are of a doubtful character, we would earnestly request of parties who would be of this opinion to communicate with us, and allow an opportunity of discussion. It cannot serve or promote the cause of agricultural improvement to denounce as "Theory" and "Book Farming" the suggestions we may feel it our duty to submit occasionally for the consideration of farmers. It would be a much better plan, if our "Theory" be good, to put it into practical operation and give it a fair trial, and if it succeeds, recommend it for general adoption. We shall always be very cautious in recommending changes, except where we are perfectly satisfied they are necessary—they are practicable—and would be advantageous, if properly carried out. We are aware it frequently happens that suggested changes and

improvements are *attempted* by parties who do not carry them out properly to give any chance of their succeeding, and then when they fail, the parties who only *attempted* what was proposed, turn upon those who suggested the changes, and abuse them as "Book Farmers," "Theorists," &c., when the fault is altogether in themselves, for not executing properly the improvements recommended. We have seen this frequently—parties complaining of their want of success in raising crops according to plans proposed to them, when they neglected the most essential things. Thus it is in reporting the results of experiments, we scarcely ever see such reports of any value as a precedent or guide to us, because most essential circumstances are not mentioned. This must proceed either from ignorance of practical agriculture, or a design to withhold the information that would make such reports useful. Agriculture is an art that requires the most diligent application, long experience, extensive practice, and an ardent desire to be a good farmer, to understand it perfectly. We submit these observations to the subscribers to this Journal. We respectfully solicit their confidence. We can assure them we are most anxious that the Journal should be useful—many who receive it are capable of assisting to make it much more valuable than it is, and we beg they will afford us their aid. The improvement of agriculture is the sole object of publishing this Journal by the Lower Canada Agricultural Society, and they have incurred a considerable responsibility for this purpose. All who are favourable to this object should render their assistance and give the benefit of their skill and experience to forward it. Their practice will be the best instruction for others, and it will afford us the greatest satisfaction to have our own "Theory" corrected where we may be in error, as we have no desire to recommend faulty systems of agriculture to farmers, and shall never consider ourselves too old to learn.

We learn from the *Gaspé Gazette*, that at a recent meeting of the Agricultural Society of the County of Bonaventure, the Council awarded a premium of 20s. to Mr. Kell, for introducing into the District a Subsoil Grubber and an improved Drill Plough, made by A. Fleck, agricultural machinist of Montreal, the President regretting that the funds of the Society did not enable them to give further encouragement for the importation of improved implements. The 20s. was immediately handed back to the Treasurer, as a subscription from Mr. Fleck, who is now a member.

We are glad to perceive that the Agricultural Association of Upper Canada, have, at a late meeting, resolved to offer premiums for several articles of Canadian produce and manufacture, with a view that the articles awarded these premiums should be forwarded by the parties exhibiting them, to the grand Exhibition of the industry of all nations to be held in England next year. This is what might be expected but we believe it requires more consideration in order that sufficient inducement may be held out to those who succeed in obtaining premiums to forward those articles for exhibition in England. Perhaps this could be better accomplished by the Association, as it would not be reasonable to expect that a party who might have one of these articles would send it to the Exhibition or go with it. If any parties undertook to forward their own articles to England, and to take their chance at the Exhibition, it would be well, provided they were sure to do so, or if they did not, that they should refund the premiums to the Association. We conceive the best plan would be, that all articles obtaining premiums for the English Exhibition, should be given in charge to the Association with the names and residence of the owners of each article appended to them, and that they should all be forwarded to England at the proper time by the Association, under the charge of a suitable deputation, and that the owners of

these articles should be entitled to the premiums, if any, obtained in England, and the articles might be sold there for their benefit. The expenses, &c., to be arranged previously with regard to the proportion each article was to be chargeable with. The expenses might be considerable, but we have no doubt, if the articles sent were excellent of their kind, and it will be useless to send any other, that they would obtain premiums, and sell well in England. We suppose the Lower Canada Agricultural Society will not be backward in offering all due encouragement to parties in this part of the Province to prepare articles to be sent to this great English Exhibition, particularly specimens of Agricultural production, from a strictly Agricultural country. We have timothy hay here superior to any hay produced in England for horses. Whatever may be done in this way, a deputation will have to be sent to England with them, to give them any thing like a fair chance. With all their variety of superior agricultural implements in the British Isles, we have never seen a more useful and simple machine, than the Lower Canada hay-cart. It is easy to manage, drawn by one horse, and according to our humble judgment, is suitable for every country, and in ordinary circumstances, would be preferable to all other carts or waggons for drawing hay or grain to the barn or stack yard. Large heavy waggons or carts, are not convenient, or suitable for most farms; they might answer very well, on good roads, and where the distance was great, that hay or grain had to be carried; but the Canadian hay-cart, for the general purposes of carrying the harvest home cannot be excelled in this or any other country. We shall take time to think of some other good things we have here, and we hope to make out a list that should be creditable to Canada. There is another article here, than which there cannot be any thing employed in the same way, that is more convenient; we allude to the Canadian truck, made use of in our cities,

drawn by one horse. These are easily loaded and unloaded, and drawn by a good Canadian horse, cannot be exceeded, on this continent, or in any other country. The great advantage of both hay-cart and truck, is their simplicity, cheapness, easy management, and efficiency compared with the cumbrous waggons, and the sort of carts they make use of in the neighbouring States, and in England. These two articles are very material items in the implements of a country, and we take upon us to say, they are not excelled, *nor equalled*, to our knowledge, for their several uses. We have some agricultural implements made here by Mr. Fleck, and implements for cleaning grain and seeds, made by Mr. Rice, equal to those of any country. We have also Thrashing Mills made by Mr. Paradis and others.

If, however, the Provincial Agricultural Societies of Upper and Lower Canada propose to take part in the great English Exhibition of the industry of all nations, they will have to do something more than offer a few small premiums for articles to be sent to England by their owners. At all events, unless there was a direct appropriation by the Legislature to assist the Societies to forward Canadian products to the great Exhibition, they can employ their other funds fully as advantageously for Canadian Agriculture by the establishment of Model Farms and Agricultural Schools in Canada. We might send products that would be creditable to us certainly, but to send them as they should be sent, would require some expenditure that our Agricultural Societies could not well spare from their present means, without neglecting the due encouragement of improvement at home. There is abundant work to be done in Canada by the Provincial Agricultural Societies.

#### AGRICULTURAL ASSOCIATION OF UPPER CANADA.

The Annual Meeting of the Directors and Members of this Society took place in the Court House, in this city, on the 20th and 21st instant.

In the unavoidable absence of the President, John Wetenhall, Esq., the Chair was taken by the 2nd Vice President, Thomas Clark Street, Esq., of Niagara Falls.

It was determined to hold the next Exhibition during the third week in September, at the Town of Niagara;—the inhabitants have promised to contribute £300 towards the funds of the Society. Much business of routine was gone through, and some important amendments of the Constitution, in the shape of a bye-law, were passed;—the materials having been supplied by the President, and J. B. Marks, Esq., of Kingston. A Committee was appointed to draft amended bills for the Provincial Association, and the other Agricultural Societies in the Province. It was likewise determined to address both branches of the Legislature, on the importance of establishing a Chair of Agriculture in the University; a Board of Agriculture, and an Experimental Farm. The Prize List was revised;—an additional premiums given both to Durham and Grade Cattle, and also to heavy draught Horses. The grand Exhibition of the industry of nations that is to be held in England next year was then considered, and a strong desire expressed that the honor and the interest of Canada require that our characteristic productions should be liberally represented in the metropolis of the Empire. The following Premiums were then agreed to in reference to this object:—

For the best set of Drawing Room Furniture, made of black walnut, diploma and £15,—second best, £10. For a set made of curl maple, —the same. Broadcloth, not less than ten yards, diploma and £5; second, £3. Blankets, the same. Tweed Cloth, diploma and £3; second, £2. The premiums on these articles to be paid upon the exhibitors giving a guarantee that they send them to England. For the second best 25 bushels of Wheat in the Canada Company's class, £12 10s;—the first prize being £25, offered, as heretofore, by the liberality of the Canada Company. Best manufactured and most neatly put up barrel of Flour, £3; second, £2. Cheese, first, £4; second, £3; third, £2. The same prizes for Butter, in firkins, not less than 56 lbs each. Other Canadian productions, not enumerated above, if of a character entitling them to be sent home, will, no doubt, receive liberal encouragement from the Society. Every effort should be made, and not a moment lost, by the people of this, the most important Colony of the Empire, to reach and sustain an honourable position among the innumerable products of the world's ingenuity and industry, that will be collected together in dear old Fatherland.

We notice, in conclusion, that the meeting appointed E. W. Thomson and Henry Ruttan, Esquires, as Judges for awarding the Governor General's prize of £50, for the best Essay on the bearings of Canals on the interests of Cana-

dian Agriculture. The other Judge, selected by His Excellency, we understand, is John Young, Esq., of Montreal. We hear that ten Essays have been sent in. The Prize List for the next Exhibition will shortly issue.—*British Colonist*.

## CORRESPONDENCE.

MR. A. FLECK'S SUBSOIL GRUBBER.

ORMSTOWN, 15th March, 1850.

DEAR SIR,—I promised when I purchased the Subsoil Grubber from you, that I would send you a statement of its performance, as soon as I had finally tested it. You know that farmers are more ready to use an implement, and put its merits to a practical test, than to write essays; but I have been so fully satisfied with the experiments I have made, and with the value of the Grubber, as an implement so essential to the proper cultivation of the soil in a climate like ours, that I feel I would not only fail in my promise to you, but also in my duty to my brother Agriculturists generally, if I did not send you a statement, embodying the result of my experiments, and also of my opinion as to its uses and adaptation. I have used the Grubber for many of the purposes to which it may be applied—in all of which I have found it an implement highly worthy of the attention of Agriculturists. In spring, upon land which has been ploughed in the fall for summer fallow, and for tearing up and destroying twitch-grass, it has fully exceeded my expectation; it can be used much earlier than the common plough, opens the soil to a much greater depth, will do the work of six ordinary ploughs, and leaves the soil so fine as to save an immense quantity of labour in harrowing for summer fallowing and subsoiling. I find it the most valuable implement yet brought into use in Canada. Indeed I think that no farm is complete without a Grubber, which, where cultivation is carried on on a large scale, will pay itself in one season, by the saving it will effect in the labour, to say nothing of the superior preparation of the soil. Two horses are sufficient to

work the Grubber, except where there is a very stiff clay soil, it may be necessary to put on a third one.

I am, dear sir, your obedient servant,  
**GEORGE CROSS.**

To Mr. Alexander Fleck,  
 St. Peter Street, Montreal.

ORMSTOWN, 15th March, 1850.

SIR,—It is due to you and to farmers generally, that I should add my testimony to what my friend, Mr. Cross, has said about your Subsoil Grubber. I borrowed the implement from him, and was, I confess, rather doubtful of its performance. But my doubts soon gave way. I used it for a day and a half last spring, upon land that had been ploughed the fall previous, and only used two horses, and did as much work in that time as I could have done in eight days with the common plough. And I also found the saving it effected in subsequent harrowing, even more than what I have stated in the use of the plough. The Grubber, I conceive, is calculated in a very high degree to compensate for the shortness of our season, by doing a great deal of work in a very short time—and doing it much better than the old method. I have no doubt, that as soon as the importance of the Grubber is known, every farmer who can afford it will have one.

I have the honor to be,  
 Your obedient servant,  
**ALEX. YOUNIE.**

To Mr. Alexander Fleck,  
 St. Peter Street, Montreal.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—By your number of last month, I observe with pleasure that the Lower Canada Agricultural Society have determined that the Agricultural Journal shall make its appearance during the present year; and hope that this timely hint will not be unheeded by our farmers; and that, moreover, the Legislature will find it its bounden duty to come forward to its support.

I am also highly gratified to see Mr. Fleck's "Farming Implements" so deservedly noticed. I spent a few days in Montreal last summer, and, with a scrutinizing eye (excuse my presumption) examined his samples of manufactured implements, which, I concluded, could not be excelled by the manufactures of any country; I will be obliged if, in your next number you insert the notice on Mr. Fleck's "Farming Implements," you will add my name to those already appended to the certificate of their excellence and superiority.

I would strenuously urge, and respectfully suggest to the several Agricultural Societies of the District of Quebec, and especially to the "District Societies," the expediency and wisdom of making a large purchase annually, of Mr. Fleck's Farming Implements, for distribution at the Exhibitions as prizes, in lieu of money: this would be a most efficient mode of introducing the use of good and suitable implements of husbandry in a district where these are too generally, very defective.

If you judge the foregoing remarks and suggestions worthy of insertion in your Journal, I shall feel both proud and grateful, and remain respectfully,

Sir,

Your most obedient servant,

**MATTHEW DAVIDSON.**

County of Quebec, 23rd February, 1850.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—Will you be so good as to reply to the following queries, on the subject of the employment of manure?—

1. Will manure gathered or made in winter be more profitable if left to heat for some weeks; or whether should it be used at once in its natural state?
2. Some farmers in this part of the country have put lime on the manure to destroy the seeds of bad weeds, &c. Do you approve of this proceeding? Does it not injure the manure, and impoverish it?
3. Would it be more advantageous to the farmer to preserve in a heap for for one year or two, the manure made or gathered this year, or ought it to be put without delay upon the fields?
4. The manure gathered this winter, is it more profitably applied on the meadows, than to plough it into the soil? For the meadows or for the tillage?

crops, would it be more advantageous to employ old manure?

RUSTICUS.

County of Borthier, 26<sup>th</sup> February, 1850.

We reply with pleasure to the "Queries" put to us above, by our respected correspondent, "Rusticus."

1st. We believe that for ordinary purposes upon the farm, manure should be made use of the same year that it is made, and when in a state of fermentation is the best time to apply it to the land and crops. This fermentation should not be allowed to proceed too far, before the manure is put into the soil. We have been in the habit of removing all the manure we could during the winter from the farm-yard to the fields, where it would be required in the spring—and we have always found it in a suitable state of fermentation at the time it was required to be made use of in spring. The remains of straw and scattered manure in the yard, at the breaking of the winter, we had collected in a heap in the yard, and we found that in the course of a month or six weeks this heap was in a very good state of fermentation to be employed in the field. In general, Canadian farmers do not have much straw in the farm-yard, nor is their manure much mixed with straw. It is consequently fit to be immediately employed in the field, and should never be kept over to the second year. Any manure will produce more benefit to the soil and crops applied the year it is made than it will after keeping to a second year. Manure overheated, before it is applied to crops, loses a large portion of its most valuable qualities.

2<sup>nd</sup>. Seeds of weeds in manure are very bad, and it would certainly be well to destroy their vitality by allowing the manure to ferment to the necessary extent for that purpose, but lime should never be applied to farm-yard manure unless when mixed in a compost heap. In that case, alternate layers of earth, manure, lime, &c., may be placed together, mixing the

lime as much as possible with the earth or moss, when making the heap. All these layers, after remaining some weeks in this state, should be mixed up together, and the more frequently the heap is turned over and mixed before it is made use of the better.

3<sup>rd</sup>. The replies given to the two first "Queries" may be sufficient for this also.

4<sup>th</sup>. As top-dressing for meadows, where there is old manure, it is generally applied; but if manure is harrowed in with grain crops, we should prefer making use of old manure for this purpose when we had it, to top-dressing meadows with it. Recent or fresh manure will answer well for top-dressing meadows, although compost might do better. There is considerable objection to the use of fresh manure as top-dressing for grain crops, as if there be any seeds of weeds in it, they are sure to grow rapidly, if their vitality is not destroyed. Fresh manure will answer much better for grain crops if ploughed in, than harrowed on the surface. Indeed we should almost prefer allowing grain crops to be without manure, to top-dressing them with any that had not been previously well fermented. For root or hoed crops, it is not of so much consequence that fresh manure should be made use of, as the after cultivation should keep down all weeds. In all cases farmers should remember, that manure cannot increase or gain anything by long keeping, but, on the contrary, will be always losing. Therefore, the sooner it can be put into the soil, and applied to the crops, or mixed in compost, the better it will be, and the greater the production.

#### ENGLISH BREEDS OF NEAT CATTLE.

In England a country abounding with luxuriant pasturage the ox, only used for the purposes of Agricultural labour in a few limited districts, is destined to benefit the grazier on the one hand, and the dairy farmer on the other; with the grazier roundness of form, a moderate smallness of bone, depth of chest, and an aptitude to acquire external fat upon a small consumption of food, are among the points of excellence aimed at and expected. The attainment of perfection, however, in the points most desirable in the eyes of the grazier is gene-

rally accompanied by a corresponding deterioration of cattle, in those qualities connected with the interest of the dairy farmer, for very seldom are combined an aptitude to fatten and the quality (in the cow) of yielding an abundance of rich milk. Both parties therefore attend to their peculiar interests, agreeing only in the care bestowed upon the animals subservient to their respective purposes.

Among the older breeds of cattle, but now greatly modified, was a long horned race of which the west riding of Yorkshire and Lancashire were the central residence, whence it extended through the midland counties and into Ireland. This breed was termed the Craven, from a district of the same name in Yorkshire bordering upon Lancashire, where it is said originally to have appeared.

In the beginning of the eighteenth century various agriculturists commenced a series of attempts towards the improvement of this old but ever valuable breed: and to the skill and judgment of Mr. Bakewell is to be attributed, the Dishley or New Lancashire Longhorn breed; in this breed the form and tendency to acquire fat were greatly improved, and the size of the bone reduced. To the grazier the improvement in these points was of the highest value, but the dairy man preferred the old stock. In process of time, however, the new breed extended, improving the cattle of the midland and northern counties, and especially of Ireland. Every where, however, the long-horned has of late years yielded to a middle or short-horned race: and even in Liecestershire the stronghold of the Dishley breed, few are now to be seen. In Cheshire, also, which till recently retained a long-horned breed derived chiefly from the old Lancashire and New Dishley stocks, the Durham or short-horned race has made decided inroads, but with doubtful advantage as respects the quality of the cheese for which that county is celebrated. Among the long-horns may be reckoned the old Shropshire breed, a large boned and hardy race, and well fitted for the dairy. This breed is now seldom seen pure, having been crossed with advantage by the short-horned Holderness. Though the short-horns have superseded the long horns in most parts of Staffordshire, the latter still continue to maintain their ground in the north of that county, and more particularly along the banks of the Don and Trent, close to the borders of Derbyshire.

The Devonshire breed is of great antiquity, and has been long celebrated for beauty; like most of our other breeds it has within the last fifty or sixty years become improved and has perhaps now attained to its perfection.

The head of the Devon ox is small but broad across the forehead, and narrow at the muzzle: the horns have a graceful curve upwards: the

chest is deep and the back straight, the cow is small compared with the bull.

The system of ploughing with oxen is very generally practised in Devonshire, and where the land is not too heavy no teams of oxen are superior, if equal to these in this kind of work. Four good oxen are equal to three horses, and will go through as much labour on the road or in the field in as short a time.

To the grazier this breed is of great importance, few oxen rivalling the Devonshire in disposition to fatten and in the quality of the flesh. For the dairy, however, this breed is inferior to many as respects quantity of milk, but not quality, for it yields more than an average proportion of cream and butter. Some farmers, however, have found the North Devons to yield a large produce of milk: contrary to the common opinion, much probably depends upon pasturage. In Somersetshire the Devon breed prevails, or at least the original breed has been greatly crossed by the Devon, of which it presents most of the excellencies. The Somersetshire cattle are valuable for: "the pail, the plough, and grazing." The tract of country between Bridgewater and Cross produces cheese of well known excellence; the best Cheddar cheese is made either in that tract or in the marshes round Gladstonbury. The Hereford improved breed with white faces, is valuable as fattening rapidly, and that on inferior fare: the flesh is fine-grained and highly prized in the market; the cows, however, yield but little milk; indeed a dairy of Hereford cattle is seldom to be found. In Gloucestershire the Herefords are preferred for the team, and by graziers for fattening, but the true Gloucester breed for milk. The Gloucester breed is of mixed origin, composed of an old race of Welsh descent, as is supposed, and of various others, and among them the Alderney. The rich vale of Berkeley produces the finest Gloucester cheese.

Alderney cattle are imported here from Normandy and the islands on the French coast, from one of which (Alderney) they take their name. These cattle are small, and often awkwardly shaped, every point being more or less defective: still they are favourites, the cows yielding milk, if not in great quantity, yet of peculiar richness and abounding with butter. Improbable as it might seem from the appearance of the Alderney, its aptitude to fatten is remarkable; the cows when dried, speedily become fat, and sometimes acquire considerable weight. Still with the exception of Hampshire, these cattle are not kept in any county on an extensive scale; it is in the pleasure grounds of the gentleman that they are chiefly to be seen. In Hampshire, however, they are very general. Mr. Gauler states that the stock best adapted to the soil of that county are the Alderney and the smaller races of Normandy cows. The Devonshire and

larger breeds require richer pasture: and although they may be kept in condition the milk they give is by no means in proportion to the bulk of food they consume. Mr. Gauler's dairy stock was in the proportion of one cow of the Devonshire breed to three of the Alderney and Normandy, and the milk was mixed on the presumption that being thus diluted it produced better butter and a larger quantity of it.

*Improvers of Agriculture.*—It is curious that many to whom improvements in agriculture are traced were not professional farmers, but men engaged in other pursuits, who, with cultivated minds turned their attention also to the subject. Thus the first English treatise on husbandry was written by Sir A. Fitzherbert, judge of the common pleas, in 1534, and from this Harte, canon of Windsor, in his *Essays on Agriculture*, dates the revival of agriculture in England. Tusser, the author of "Five Hundred Points of Husbandry," published in 1562, was a scholar of Eaton, and afterwards of Trinity Hall, Cambridge. Before he applied himself to farming and literature, Sir R. Weston, who was ambassador from England to the Elector Palatine and King of Bohemia in 1619, introduced clover into England; his discourse on the husbandry of Brabant and Flanders was published in 1645, and is said to mark the dawn of the vast improvements which have since been effected in Britain; Evelyn who is considered one of the greatest encouragers of improvements that has ever appeared, was, as is well known, a gentleman attached to literature and science, and often employed in the public service. He published, in 1664, his *Sylva*, or a discourse on Forest Trees and the Propagation of Timber in His Majesty's Dominions, with many other works, which had a great influence in the improvement. Jethro Tull, who introduced the drill husbandry and published his work on Horse-hoeing Husbandry in 1737, was bred a barrister; he first made experiments on his own estate, and then practised farming.—*Boyle on the Productive Resources of India.*

#### MANUFACTURE OF CHEESE.—No. 1.

IN some parts of the kingdom, the manufacture of cheese is as perfect as if the process were directed by the best rules of science, and performed by hands trained by experience and practice. In other parts the process is in perverse contradiction to the maxims either of science or experience. In various districts the value of the best cheese varies at least thirty per cent. The common prejudice is, that certain districts enjoy natural advantages as to cheese making. This, however, is certainly an error; for here and there in every region there are managers of dairies who make an excellent article, and these carry their art with them into whatsoever district they may migrate. Without

question the quality of the land and the herbage does, in a certain degree, modify the character of the cheese. The same differences also create a necessity for some slight modification of the process of manufacture. How far this difference extends will be enquired as I proceed farther into the subject; but as a general rule, it may be said that the quality of the cheese depends wholly upon the skill and care with which the process of manufacture is conducted. Different kinds of cheeses are made in various districts, and of course each variety requires a modification of process. But whatever kind of cheese is made, its quality depends on certain cautions being observed in the manufacture which are equally necessary for one as another kind of cheese. The defects and the excellencies of every sort of cheese are akin in character, and are produced by similar causes. It is obviously of much importance to establish some general principles of manufacture which may guide dairymen. It is especially important just at this juncture, when the contest between our inferior descriptions of cheese and the produce of America and Holland turns more and more every month to the advantage of our own dairymen. He would perform a most useful work who should assist in every so little a degree in diffusing among the least skilled the rules which are observed by the best makers of cheese. Science is doing and has done much for us; but its results have been for the most part brought about by a more intelligent observation of facts, which experience had already taught practical farmers in some districts. A little while ago, it became expedient to me to search after the best method of cheese making. I enquired of neighbours, some of whom were successful, and others unsuccessful makers of cheese. What one told me was right, another said was wrong; and sometimes I was advised to provide against a defect by the very means which another told me would produce it. I looked with some diligence into books; but here I found similar discrepancies, and I gathered a deal of information without attaining much knowledge; I found everything except just what I wanted to know, namely, how to guard against the several defects which appeared in the cheese manufactured in my own district. I then began to make enquiries in parts of the kingdom distant from my own locality as well as near to it, and found every body very willing to render me an account of his mode of manufacture, and the peculiar character of the cheese. From these enquiries I soon saw very abundant reason to attribute certain defects to causes I had not recognised before. One defect was scarce ever found in one district, and there I noted a difference in the process, and so in other districts. Afterwards, on turning to our own neighbourhood, I was able to discover that

in the dairies, where certain defects were common, the process differed exactly as I should have inferred from what I had learned farther abroad. I am induced, therefore, to believe that it may serve at least to guide the enquiries of others, if I set down plainly the results I have arrived at. I need not perhaps take much pains to caution any one against accepting too implicitly such opinions as I offer; one is not apt to receive too much confidence from practical men. But deductions from empirical practice can never be held quite trustworthy until they have been confirmed by special experiments directed to the solution of each special question. It is to be hoped that the process of cheese-making may receive a portion of the attention of both scientific men and practical farmers; for hitherto it has been much neglected by both.

What I have to offer on practical points, requires that I should, in the first place, shortly state the properties of the composition of milk, and the rationale of the process of cheese-making. There is perhaps a good deal which is rather obscure to scientific chemists in the process; and as I am not even a chemist, I may omit to state something material, as well as shew myself ignorant of some of the latest and subtlest results of scientific investigation.

The analysis of milk by various chemists shows that its composition varies considerably as to the portion of its ingredients. It contains curd or casein, butter, sugar, and several kinds of saline matter. The curd, butter, or the sugar, are each sometimes more abundant than the other two. In the earlier period after calving, the cow yields milk very rich in casein; later the sugar or the butter may predominate; and the description of food, as well as the habit of the beast, makes much difference in respect of the proportion of each of these ingredients. We may assume that the three are on an average equal in quantity though the assumption is not quite in accordance with the actual fact. If we do so assume their proportion, then we may further assume their whole quantity to be about twelve per cent. of the weight of the milk. A gallon of milk weighs rather more than ten pounds, therefore ten gallons will contain about four pounds of curd and four of butter, and as cheese when made contains from twenty-five to thirty-five per cent of water, almost one pound weight of cheese curd would on this calculation be yielded by a gallon of milk—a quantity which is nearly the average yield in the actual practice of cheese-making. The average quantity of saline ingredients in milk may be stated at one two-hundredth part of the milk's weight. These ingredients are phosphates of magnesia, lime, and iron, chlorides of potassium and sodium, and a portion of free soda; which last is of most importance in solution, to the process of cheesemaking.

The soda may be taken as one-twelfth part of the weight of the whole mineral ingredients of twenty gallons of milk, therefore, which weigh two hundred pounds, and yield one pound of ashes, will contain one and a quarter ounce of free soda. The curd is held in solution in the whey by means of this small portion of free soda. The butter is merely suspended in the milk, and exists in the form of minute globules enclosed in a pellicle.

When milk turns sour, and the air is above a certain degree of temperature, the curd coagulates, and the coagulum is more or less firm as the air varies in its degree of heat. The souring of the milk is caused by the conversion of a part of the sugar of the milk into an acid called lactic. This acid neutralises the free soda which holds the curd in suspension. The butter of milk, as we know, rises to the surface when the milk is suffered to stand; but until released from the envelopment in which each particle is wrapped, it is in the form of a creamy substance. A little beating of the cream at the higher temperature, or churning it at a lower, separates the butter. It is material to bear in mind that a certain degree of warmth does separate the butter from its envelope. The process of cheesemaking begins by inducing an immediate souring of the milk. This may be done by several agents; but we need only mention rennet. When a portion of rennet is added to milk, the conversion of the sugar into lactic acid almost immediately begins; and just as happens when milk sours in warm weather, a coagulum is formed which is firmer in proportion as the heat of the milk is high. It may be as well to state the mode in which rennet is supposed to produce this effect; because, as we see, on the right adjudgment of the quantity of the rennet and the temperature of the milk, depends the first *sine qua non* of the felicitous issue of the whole process of cheesemaking. Rennets, as well known, are much improved in strength by being kept a considerable time. It is supposed that the animal matter of the rennet-skin exists in a certain state of decomposition, and that when brought in contact with the casein of the milk, it induces in it a similar change to that which itself is undergoing. Side by side with this change in the casein goes on the conversion of the sugar of the milk into lactic acid. We do not understand how the rennet operates to induce these changes; all we know is that they do take place. But there are abundant instances familiar to us of similar effects produced in substances by other agents. For instance a small portion of yeast is added to a wort, and straightway it causes the gluten to change into yeast, while the sugar is changed into spirit and carbonic acid. A small particle of putrifying matter, too, induces putrefaction in any animal substance. But that

which it is chiefly to our purpose to remark is, that each degree of temperature, within certain limits, gives greater activity to the operation of these agents, and modifies the products they engender; and that a larger quantity of them also renders the change more active. Every one knows how easily a high temperature of the air gives to butter its strong rank flavour; and it is easy to conceive how too much rennet at a high temperature may induce changes in the casein and the butter which cause the cheese to be strong. When we consider, too, that the quantity of free soda may vary greatly, we can conceive, that as the rennet will necessarily be required to change a greater portion of the sugar into lactic acid, in order to neutralize an excessive quantity, there will be a difference in cheese made from pastures or food, which cause the milk to contain an abundance of free soda.

After stating the properties of a good cheese, and the common defect of bad, I will proceed to the practical part of cheesemaking, and in each step of the process will enquire into the cause of the particular defect, which arises from its being conducted faultily. Whether in a Stilton, a Cheshire, Gloucester, Leicestershire, or Cheddar cheese, we require first that it should be free from rankness and mawkish taint. The texture too in all should be close and free from holes, but also tender, unctuous, and mealy. Of the faults in flavour or in texture the following seem to be the most prominent and most common:—

The cheese may be strong, what in my part of the country is usually called, "tasting of the rennet." I imagine this fault is really due to the mismanagement of the rennet. Too large a quantity and too high a heat tend to produce it. Its immediate cause I take to be certain changes in the butter of the cheese, like those which occur when butter goes rancid, and which consist in the conversion of a portion of the butter into cuprois and other fetid rank acids. The cheese may have a mawkish, tainted flavour and taste. This fault I believe is due to the occurrence of a degree of putrefaction, which commonly is the result of uncleanness of the utensils, or from exposure to air and imperfect salting in warm weather. The cheese may heave, in which case there is frequently a tainted taste of the middle portion of it. The heaving is caused by the fermentation of the whey, and the consequent generation of gasses which swell the substance of the cheese, and fill it with crevices and holes. This fermentation is, I conceive, vinous: the sugar of the whey is converted into alcohol and carbonic acid, which latter not finding an escape, swells the substance of the cheese. We know quite well what engenders and what prevents vinous fermentation; and therefore we cannot be in much doubt as to

the causes of the remedies for this kind of defect in cheese. These I will notice when speaking of that part of the process which determines the quality of cheese in this respect. A close toughness of texture is caused by too high a temperature of the milk, when the rennet is mingled with it. To the same cause is also due the little holes which are scattered through tough cheese, and which are filled with whey: the toughness does not permit the whey to exude, though it makes its separation from the curd more entire. Too soft and pulpy a texture is caused by too low a temperature of the milk. Of the particular flavour and texture of a sour cheese, I need not say more than that they are familiarly known to all, and their cause and its remedy obvious. There are other faults, but it is scarcely material to notice them, because any plan of manufacture which obviates the greater will also obviate the less marked defects. In my enquiries I gained a knowledge of the method of making most kinds of cheese, from the rich Stilton down to the skim-milk quality of each dairy district. But it will be better if I confine myself to the making of cheese from milk without the addition or subtraction of any portion of cream.

The first question which presents itself is whether it be preferred to employ new milk fresh from the cow, or to allow the whole or a portion of the whole to stand over one or more meals. In some parts of the country one plan is pursued, and in some another; but as in those districts which send forth the best article the general practice of dairymen is to mingle old and new milk, we might be justified in the presumption that the practice is the best of using mixed milk. In the best dairies of Leicestershire they use new milk; and therefore we may be assured that both plans are good when well conducted. Perhaps as in the case of governments, "what's best administered is best." Still the difference in quality between the best Leicester and the best Cheshire is sufficiently in favour of the latter to make it worth while to enquire wherein there is an advantage or otherwise in using mingled milk. In Cheshire they adopt no other caution in keeping the milk over one or two meals than placing it in pans in an underground cellar. They thus prevent its souring. But some people allow the pans of milk to stand in a shallow cooler which is constantly supplied with cold water from a well, and the pans being covered the milk is kept at a temperature but little above fifty-two. In answer to questions as to the effect of using old milk, the unanimous answer of good makers is that the cheese is richer and more mellow. Some difference of opinion exists as to the precise mode in which the rennet acts on new or on old milk. But I have generally been told that less rennet is required

for a given quantity of mixed milk than of new; and also that a good curd may be attained at rather less temperature. I believe that both opinions are correct, but I have generally been told that less rennet is required for a given quantity of mixed milk than of new; and also that a good curd may be attained at rather less temperature. I believe that both opinions are correct, but I have not verified them by experiments accurate enough to be relied on. One can easily conceive that exposure to the air may have some chemical effect on the casein of the milk. The change made on the casein by the oxygen of the air may dispose it to receive more readily the action of the rennet. It may also cause the curd to have a slightly altered texture; for we know that souring produces such a change as makes the curd quite obscure the taste of the butter in the cheese, and we can therefore conceive that its oxidation may cause the curd to have such a texture as allows the richness of the butter to be more prominent. In the dairies of Liecestershire and Derbyshire the greatest difficulty is experienced on some pastures in preventing the cheese from heaving. They adopt several expedients to prevent the fault, and one of them is the laying aside a portion of the milk and taking from it a part of the butter. The notion is that the over-richness of the milk in the butter disposes the cheese to heave. I do not see, however, how the butter can have any such effect; on the contrary I imagine that an excess of butter would have quite the opposite effect. It seems to be more likely that the exposure of the milk and not the removal of the butter is the real cause of heaving being prevented—if indeed it be prevented—by this means. In Cheshire it is seldom that heaving is complained of in the best dairies; and there the fault is always attributed to an imperfect extraction of the whey. But one fact is clear, namely, that a cheese made from skim-milk very seldom heaves; and when it is at all soured never.

The temperature of the milk when the rennet is added is no doubt one of the most important points to be attended to. When we see that not one in five hundred dairymen make constant use of thermometer one need not wonder at the frequent derangements that occur in the best dairies. A person cannot tell within twenty degrees of what temperature a liquid is by placing the hand in it. Take the hand out of cold water and then put it in milk of 70 degrees and it will feel quite warm; first place the hand in water heated to 100 degrees, and that at 70 will feel quite cold. Now milk, which is of the temperature of 98, as it comes from the cow, will lose several degrees in being carried to the cheese pan in cold, and will lose little in hot weather. Nothing certain therefore can be known about the temperature without the ther-

момeter when even old and new milk are used. But when old and new milk are used, and the former requires warming, very great mistakes must often happen.

#### ON DRAINING AND THOROUGH LOOSENING OF RETENTIVE CLAY SOIL.

*To the Editor of the North British Agriculturist.*

Sir,—As the season best suited for marking out and forming drains is now approaching, viz., spring and summer: the land springs and stagnant hollows, on account of the accumulation of water during winter, are more easily found out. Allow me to draw the attention of those of your readers concerned, to this most important first step to successful agriculture.

It may be thought going too far to insinuate, that every description of land, whether wet or otherwise, should be thoroughly drained; although there is little doubt but advantage might be derived from this operation by admitting the air more freely into the interior of the active soil. Underground climate is as necessary to the well-being of a plant as terrestrial climate. Although the roots of a plant burrow below the surface of the ground, they are not, on that account, insensible to the influence of the air. Both extremities of the plant feed upon the air, and the roots are said to do so more than the leaves. Place a plant in an exhausted receiver, the leaves soon drop off, to be followed by the decay of the branches and the stem. Roots, in similar circumstances, will soon shrivel and die. Hence it is, that the admission of air into, and the temperature of the ground, require to be regulated, as well as at the atmosphere that presses above it.

It is well planned and well executed drains, accompanied by the deep breaking up of the soil, that underground climate is improved, more especially in stiff clay land. Until the advantageous effects of thorough drainage became evident, perhaps the subject of underground climate was not so much thought of. Many suppose the great advantages derived from good drainage only consist in the removal of superabundant water, and that air and heat have nothing to do with the active soil. Water of itself is not an evil, it is the food of plants, and its absence is attended with very fatal results. It is the excess of water that proves injurious; and why? because it excludes the air. All the interstices between the particles of the soil being occupied with water, air is necessarily absent except a very small portion contained in water; but remove the superfluous water, then air takes its place, and holds in suspension as much water as necessary for nourishing the roots of the plant, and hence the necessity of not only draining and breaking up strong adhesive clay land, but also, of mixing with it such substances

as will have a tendency to form the many thousands of canals, though which air and water may freely find admission to the roots of the plants. For this purpose, rough stable manure, where bean-haulm has been used as litter, coal ashes, roasted turf, unsound, charred faggots, bottoms of turf, and peat bins, &c., will be found of great service.

Another very important advantage, connected with thorough draining and thorough deep ploughing, is the increase of temperature attendant on these operations. It has been ascertained by those conversant with the advantages of proper drainage, that *drained land in summer is from 10° to 20° warmer than water-logged land.* The gardener is well aware of the great advantage deprived from bottom as well as from top heat, being applied to those plants which are natives of a climate warmer than our own, and also the beneficial effects of not only warming the water to be applied to the roots of these plants, but also of covering his vine borders with tree-leaves, or long litter, and of constructing tanks for warm water, and hot beds whereon to grow his melons and cucumbers with any degree of success; and why should not farmers, by proper drainage, endeavour to raise the temperature of the land, so important to the growth of those crops which they cultivate, as scarcely any of these are natives of countries so cold as our own.

Heat cannot be transmitted downwards through water-logged land, but remove the superabundant water, and the heat radiated on the surface of the soil, and air will descend, as well as ascend, and the moisture or particles of water in the soil will be rarified or converted into vapour, the best state in which it can exist as nourishing food for the roots of the plant.\*

Evaporation from the surface of water-logged land has a tendency to lower, rather than to raise the temperature of land, in the same way that wet flannel wrapped around a jar of wine or any other liquor, and placed in the sun to evaporate, has a tendency to cool the wine, &c., in the jar.

Seeing, then, that air and water combined with caloric, in the form of vapour, are in a state highly susceptible of being absorbed or sucked up by the sponges of the roots of the plants; and that thorough draining, and deep ploughing or trenching are the best means, on a large scale, to be employed in bringing these elements into operation, why not make draining and thorough breaking up of the soil, the first and most essential point in farming?

The Deanston or "Frequent Drain System," which is practised here to a great extent, is justly considered the best, the distance between

the drains being from 15 to 18 feet, and running parallel with the declivity of the land, and discharges from them being carried off by the main drains directed along the bottom, or lower part of the field. Thirty inches or 3 feet, will be sufficient depth, and for main drains 6 inches deeper. The width of these drains will depend upon the materials with which they are to be filled.

The most prominent and best filling is tiles and rough gravel, or small stones, about the size of road metal. The tiles may be either the semicircular of 3 inches diameter, with soles, or pipes of 2½ inches with collars (those having a flat side, are not so ready to sink into the clay), for the "frequent drains," over which may be laid 6 inches in rough gravel or small stones. If the stone or gravel is to be dispensed with, from 2 feet to 30 inches, will be depth enough, although there can be no doubt but the additional 6 inches of stones or gravel will make by far the best drain.

#### EFFECTS OF LIGHT ON VEGETATION.

*To the Horticultural Editor of the Farmers' Gazette.*

SIR,—I think it is Sir H. Davy that selected the following story:—"A manufacturer of carmine, who was aware of the superiority of the French colour, went to Lyons for the purpose of improving his process, and bargained with the most celebrated manufacturer in that city, for the acquisition of his secret, for which he was to pay £1,000. He was shown all the process, and saw a beautiful colour produced, but he found not the least difference in the French mode of fabrication and that which had been constantly adopted by himself. He appealed to his instructor, and insisted that he must have concealed something; the man assured him that he had not, and invited him to see the process a second time. He minutely examined the waters and the materials, which were, in every respect, similar to his own, and then, very much surprised, said, 'I have lost my labour and my money, for the air of England does not permit us to make good carmine.—' Stay,' said the Frenchman; 'do not deceive yourself, what kind of weather is it now?' 'A bright sunny day,' replied the Englishman. 'And such are the days,' replied the Frenchman, 'on which I make my colour; were I to attempt to manufacture it on a dark or cloudy day, my results would be the same as yours—let me advise you, my friend, always to make carmine on bright, sunny days.' 'I will,' rejoined the Englishman, 'but I fear I shall make very little in London.'"

A well-known proverb is, "make hay while the sun shines." We are told that philosophers are not agreed as to the peculiar action which light exerts upon vegetation, and there is even

\* See Remarks by Dr. Lindley in the *Gardeners' Chronicle* for 1849, p. 35.

some doubt respecting the decomposition of air and water, during the process; one thing is undeniable, the necessity of light to the growth and health of plants, and, accordingly, they are, for the most part, so formed as to receive it at all times when it shines on them. Their cups, and the little assemblages of their leaves before they sprout, are found to be more or less affected by the light, so as to open and receive it. In several kinds of plants, this is more evident than in others; their flowers close entirely at night, and open in the day. Some constantly turn round towards the light, following the sun, as it were, while he makes, or seems to make, his revolution, so that they receive the greatest quantity possible of his rays. Thus, clover in a field follows the apparent course of the sun. But all leaves of plants turn to the sun, place them how you will, light being essential to their thriving.

A few of the effects of light upon vegetation, pointed out to your readers, may be useful to some of them.

We are told that solar rays appear to be the immediate cause of perspiration, which proceeds in proportion to their intensity; yet this action is necessarily modified by the state of the mediums—that is, of the atmosphere which surrounds them, in proportion to its heat and dryness, will their power be augmented, and in proportion to its cold and moisture, diminishes.

The physiological effect of an excessive augmentation of perspiration is, to dry up the juices and to destroy the texture of the leaves; on the other hand, an excessive obstruction of that function, prevents the decomposition and assimilation of the fluids, and the formation of new organized matter, as well as of the secretions peculiar to a species.

We are also taught that it is to the action of leaves, to the decomposition of their carbonic acid and of their water, to the separation of the aqueous particles of the sap, from the solid parts that were dissolved in it, to the disposition thus effected of various earthy and other substances, either introduced into the plants as silex and metallic salts, or formed there as the vegetable alkaloids, to the extraction of nitrogen, and probably to other causes as yet unknown, that the formation of the peculiar secretions of plants, of whatsoever kind, is owing. And this is brought about principally, if not exclusively, by the agency of light. Their green colour becomes intense in proportion to their exposure to light within certain limits, and feeble in proportion to their removal from it. Also, among the immediate causes of the peculiar changes that occur in the secretions of fruits, are heat and light, without which the peculiar qualities of fruits are imperfectly formed, especially in species that are natives of countries enjoying a high, summer temperature.

It is found that among the effects of a high temperature, and an exposure to bright light is the production of sugar and of certain flavours, and that under opposite circumstances acidity prevails.\*

On the importance of light to fruit trees, Mr. Errington very justly remarks: the beneficial influence of a free admission of light to all parts of a fruit tree are mostly admitted in the aggregate, but still not justly appreciated in the detail. It has become quite fashionable during the last twenty years, to talk of the vast influence which this element has over vegetation; yet we still find gardens, the majority, we fear, in which, during the prime of summer, the fruit trees are smothered with young spray, and that, too, at the very period when solar light, acting freely on the leaves of those portions of the tree considered permanent is, indeed, alone beneficial. At the close of the year everybody begins to think of pruning at least as soon as the leaf has fallen, and then, when light is no longer of service, every pains will be taken to remove useless spray and to prepare for another smothering or checking course, which the absence of summer pruning is sure to produce. Now, why is such a course pursued? A niggardly economy, no doubt, will be found to lie at the bottom of the whole affair, as to many persons who having either time or inclination themselves to perform these operations, are yet able to employ a person to do it for them. We have, in our day, repeatedly known a whole garden of trained fruit trees completely spoiled, as to the prospect of well-organized buds for the ensuing crop, or of a fruitful habit in ensuing years, though a fortnight neglected during the months of June or July.

Many field crops are also greatly injured by one part over seeding the other.—Yours, &c.,  
PETER MACKENZIE, *West Plain-Stirling, Feb. 12, 1850.*

#### GREAT VALUE OF WINTER TILTH.

Practical men have been long acquainted with the value of the pulverization of the soil that is affected by the vicissitudes of the weather during the currency of the winter. The water in the soil is alternately expanded and contracted by the frosts and thaws, and the earthy particles are severed and pulverized in a very minute manner, which no artificial cultivation is able to approach. Being dried by the winds and sun of the spring, this pulverization forms the "March dust," which is so much prized by farmers, and is the nearest possible resemblance to the alluvium of nature, in which plants so very much delight to dwell and grow. It is most peculiarly grateful to small seeds, as clo-

\*Theory of Horticulture.

vers and turnips, and, in fact, is essential to their prosperity.

My attention was very forcibly called to the truth of the above fact during a visit of last year to the Royal Farms at Windsor. The soil of these farms may be called a loamy stiff land, varying from clay soil to the turnip loam. A field on the Flemish farm, a stiff green crop loam, had carried a crop of swedes and beet-root, which was removed from the land in the early winter, and a part of the field was ploughed into ridges, in preparation to be sown with barley. The other part was ploughed in the spring month of barley sowing. Grass seeds were sown over the whole field in the usual way and quantity, which produced a heavy luxuriant crop on the winter-ploughed part of the field, while very few plants appeared on the part that was ploughed in the spring. The treatment of the whole field was every way the same. The grass seeds came from the same seed-shop, and were used in the very same quantity. This quantity was very kindly pointed out to me by Major-General Wemyss, who manages the royal farms, and who is most particularly observant of and cognisant with the facts of enlightened agriculture, as they are found to proceed from the systematised experience of the art.

All lands which possess any part of clay should be ploughed in early winter, and even light lands are much benefited thereby.

ARATOR.

August, 29, 1849.

#### TO DRIVE AWAY RATS.

To the Editor of the *Sussex Agricultural Express*.

SIR.—Seeing a useful article on the destruction of rats in your last week's *Express*, I beg to forward you the following plan, which I think your readers may find useful:—A short time since I was told by a friend of a most effectual remedy. An acquaintance of his, a farmer, was so alarmingly beset by these destructive marauders, whose name was legion, that the usual aids of dogs, cats, ferrets, traps, &c., were unavailing; he was fairly put to his wit's end. He at length bethought him—lucky thought—that the most effectual way of dispersing an unmanageable mod of enemies of whatever kind, was to call in the aid of the red coats; so the next rat caught in a trap he enlisted or impressed into his service, had him *notens volens* clothed securely in scarlet, and then let him loose; away he madly galloped, and dashed into the midst of the enemy—consternation seized upon the whole host *instantly*—the panic became general—helter skelter they went—he screaming and they too; the harder they ran the more he strove to keep up with them, so that at last it became every one for himself, and a certain personage

take the hindmost;” “in less than no time,” or four-and-twenty hours, not an enemy was to be seen.

HELP YOURSELF.—Beg, borrow, seek office, fish for place, trust in patronage, wait for old men to die, worship fortune—who does not one or another of these? Who does not expect to rise by the help of others? Help yourself and God will help you. Nine-tenths of the world live and die infidels to this truth. So destitute are most people of the knowledge or belief of this truth, that give them the slightest indications that they may rely on you, eat you, clothe themselves out of you, and they will do it without mercy. They will drop their tools and their labor, and do it. This it is that makes the world so hedge-hoggish. The self-helpers know that, in the common run, if they know others, they may help and be—eaten up. This it is that spoiled most, if not at all, the experiments to apply the science and economies of association to practical human life. Take people as they rise, and put them together in a bee-hive community, and half of them will turn drones and live upon the rest, because they have not been educated to rely upon themselves, but just the reverse. No wonder that the swarm should be eaten up by these drones, or exhaust itself in an effort to turn them out. Yet men are naturally self-reliant. The moment a baby can go alone, it goes itself and imitates all kinds of work, proud to be doing something. But this disposition is not encouraged, but discouraged. The rich are ashamed to have their children do anything menial, as if menial and mean were the same word. The poor cannot be bothered to teach work to babies, and when their babies get to be old enough, they overload them with it untaught. Hence, the child comes to maturity educated to sloth, “bad health,” and reliance on others, or to hate the burden which crushes him, and longs to be relieved entirely from it. Self-reliance is destroyed every way, in work, thought, and opinion; whole classes, we say races, of men, are taught to feed upon others, without returning any fair equivalent. They even think themselves generous to leave a little which they do not eat.—*Chronotype*.

CULTIVATE ENERGY.—Many of the evils, the want of vigour, the inaction of system, the languor and hysterical affections which are so prevalent among the delicate young women of the present day, may be traced to a want of well-trained mental power, and well-exercised self-control, and to an absence of fixed habits of employment. Real cultivation of the intellect, earnest exercise of the moral powers, the enlargement of the mind, by the acquirement of knowledge, and the strengthening of its

capabilities for effort, the firmness for endurance of evils, and for energy in combating such as may be overcome, are the ends which education has to attain; weakness, if met by indulgence, will not only remain weakness, but becomes infirmity. The power of the mind over the body is immense. Let that power be called forth: let it be trained and exercised, and vigour, both of mind and body, will be the result. There is a homely, unpolished saying, that "it is better to wear out than to rust out;" but it tells a plain truth, rust consumes faster than use. Better—a million times better—to work hard, even to the shortening of existence, than to sleep and eat away that precious gift of life, giving no other recognizance of its possession. By work, or industry, of whatever kind it may be, we give a practical acknowledgment of the value of life, and of its high intentions, of its manifold duties. Earnest, active industry is a living hymn of praise—a never-failing source of happiness; it is obedience, for it is God's great law of moral existence.

BRUSSELS SPROUTS.

This may be called the most delicious of the cabbage tribe, and perhaps on table the handsomest. It is a tall plant, and the habit is to shoot out small sprouts the whole length of the stem; these sprouts form small cabbages—cabbages in miniature, as it were, perfectly hearted at the size of a walnut; these are gathered and cooked without disturbing the shape, and they eat tender and far milder than any of the family. The seed is sown in March, April, or May, or in all three months. The young plants require to be thinned out, or drawn out, and those which are drawn out may be pricked into a bed three or four inches apart all over, and be left to grow into strength until they are ready to plant out, and there is ground ready to receive them. These plants, as they grow, do not occupy much ground in breadth, because they are not spreading; they may be one foot apart in a row, and the rows eighteen inches apart; and they may be put out after a good shower of rain, or the ground must be well watered all over before you plant, as they ought not to receive a check on their planting out. These require earthing up as much as anything, but they should be well established and growing before it is done, and a dry day should be selected for the work. The keeping them clear from weeds, and occasionally stirring the earth between them, comprises all they want afterwards; and when they have grown to their height, and the sprouts begin to move, the tops should be taken off and eaten, as it hastens the perfecting of the sprouts, which may be pulled off when they are the size of a good walnut, and should be boiled whole. They are perfect little cabbages, dif-

fering in no respect but size from cabbages in general. In gathering they require to be gone over a number of times, because none of the buds should be taken off until they are large enough, and four or five pickings will hardly clear them, as they continue sprouting for a considerable time. The seed of this green can never be depended on unless imported.—*Horticultural Magazine.*

LIME AND SALT.

To the Editor of the Mark Lane Express.

Sir,—The direction given in your last for mixing these articles is imperfect. When thus heaped together dry, they do not act upon each other, and might just as well be strewed separately. They should be made damp—not pasty, but heavy, crumbly, and free from dust (like a mellow arable soil), and intimately mixed, not left in layers.

They may be laid down according to Mr. Hillyard's direction, but watering each layer of salt as it is put on, and mixing all intimately together, the next day sprinkling in more water, is necessary, till there is no dust to fly, but taking care not to add too much, so as to leak away the salt. It should be kept damp, turned over frequently, and the longer it remains (in reason) the better; three weeks will do, but not so well as three months. J. PRIDEAUX.

THE BEST MODE OF MIXING SALT AND LIME.

"Soda made according to the plan of J. Bennet, Esq., M. P. for Wiltshire, I have found a good application to land at the proper time. Lay three inches of unslaked lime, ten feet long and six wide, as a bed, and then spread one inch thick of common salt. Repeat these layers till a bed two feet high is formed. If the mixture is made in summer, when it is dry, it may be in the open air; at other times, under cover. After ten days, turn it over, and repeat the turnings five or six times, at intervals of seven days; spread from a cart about sixty bushels per acre, covering the horse with a sheet or cloth, to prevent burning the hair off. It should be ploughed in before wheat-sowing."—*Hillyard's Practical Farming.*

Idleness wastes a man as insensibly as industry improves him.

Correct taste is always true to nature; the "beautiful appearance of the earth and heavens," the regular change of the seasons, the succession of day and night, fill the heart of him who is influenced by it with rapture. The nearer works of art approach the perfection of nature, the more consonant they are with good taste, and they command lasting and universal admiration.

# Agricultural Journal

AND  
TRANSACTIONS  
OF THE  
LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, APRIL, 1850.

It cannot be denied that many of the population of Canada are dissatisfied at the present state of the country, as regards trade and commerce, the low prices of our products, and the want of full employment for the working classes. We do not dispute that all these causes of dissatisfaction do exist to some extent, but we do not attribute them all to the same causes, that, perhaps, others do, nor would we propose the same remedy. It is not in the cities or towns that the remedy is to be sought for. The improvement of the country and her agriculture, is the only remedy that can relieve us, and remove the cause of dissatisfaction. Houses and stores were multiplied in our cities and towns, and no attention given to the country, or its productions. All the movable capital that could be had, has been employed directly applied to production in the country. The low prices of agricultural productions may discourage farmers from expending money, or labor on improved husbandry, but the only remedy for low prices is the increase of productions that will be of the most value. Oats, barley, and peas, are low this year, but farmers should be in such a position as not to require to sell these articles at extremely low prices, and should only grow them for their own use, unless the prices were remunerating. They should rather grow wheat, raise horses, and cattle, and have butter, cheese, and wool to sell, which bring fair prices, even now. It would not be advantageous to produce crops that would not remunerate, but there is no necessity that we should do this, when we may

produce articles that will pay. If farmers were properly instructed, and our system of agriculture more perfect, we should know better what crops to grow, how to cultivate them, and the proper uses to apply them to. It may be imagined what spare produce a farmer is likely to have to dispose of, from a poor exhausted farm, and a poor stock, badly kept, and we know that many farms are thus circumstanced? To improve this state of things, should be one of the first objects with all true friends of Canadian prosperity. Capital is wanted to farmers, and it is all very fine to say to them, "Create your own capital;" but in most circumstances the thing is impossible, and unless they are to be provided with an accommodation in some other way, they may rest in their helplessness, and poverty. It appears to us that the true remedies for the improvement of the condition of Canada, are the establishment of Model farms and Agricultural Schools for the education and practical instruction in agriculture, of young farmers—by circulating useful information amongst farmers of the present day—by introducing "Associations of Agricultural Credit," under proper regulations and management—by the establishment of manufactories for supplying our own wants, on as good terms as we can obtain them elsewhere—and by all parties uniting cordially to carry out these measures for the general benefit of the country. We propose the establishment of manufactories, in order to find customers for products, if we cannot export them to advantage, and to find employment here for those that might otherwise leave the country to seek it elsewhere. The due improvement of agriculture would also give employment to many additional hands. These are ameliorations that are in our own power to effect. It may not be possible to obtain at once, all the benefits that these measures would be sure to produce in reasonable time. So far as agriculturists are concerned, they are seldom anxious to become rich in a hurry; knowing the difficulty of doing so, they,

we know, will bide their time with patience, if they can only see a prospect of being able to improve their condition. To all other parties we would say, that riches accumulated gradually, from the improved trade and resources of our country, are much more likely to remain permanently, than when rapidly acquired by any other means. What we are anxious to establish is, that the unsatisfactory state of the country, is capable of being improved by means that are within our own power, if we only employ them judiciously. We are anxious to see every interest in the country in a prosperous state, but we feel convinced this state of prosperity is impossible, while agriculture is left in a languishing, unproductive state, in a very large portion of this country. We may be thought in error in our estimation of the vast importance of agriculture, but if we are, we would beg some party who considers us so, to enlighten us upon the subject for the public good. We would be sorry to be the means of inclining the attention and industry of the people in a wrong direction, but if agriculture is of so much importance as we pretend, it is impossible to do too much to secure its improvement and prosperity. We can see encouragement held out to us in the free navigation of the St. Lawrence, and in the hope of freedom of trade with the neighbouring States. These are advantages that cannot fail to be of vast benefit to us, if we only increase our productions to enable us to realize this benefit. If we are able to sell grain in the United States, we shall certainly be able to sell cattle there. We cannot perceive that there exists any impediment to prevent us from gradually attaining a most prosperous state, if it is not our own fault. We must not expect all this in a year, but it will come in good time, if we employ the means in our power with united energy. Agriculture has been too long neglected to bring it to what it is capable of in a short time, but let the necessary measures be commenced at once,

and we shall soon see that it is capable of securing the prosperity of Canada.

**THE CANADIAN HORSE.**—We again beg to offer some observations respecting the Canadian horse, that might be so valuable an article of produce for sale to our neighbours of the United States. For more than twenty years we have been endeavouring to persuade Canadian farmers to cultivate the unmixed breed of Canadian horses, as the best and most suitable for agricultural purposes, and the most profitable for sale. Agricultural Societies, we conceive, have been much to blame in not having a distinct class for pure Canadian horses, and brood mares, and excluding all animals that were not manifestly of pure breed. They might have any other classes of premiums they thought proper for horses of mixed breeds, but in the Canadian class no mixed breeds should have been allowed to compete. We know that such classes of premiums have been adopted, but we also know that mixed breeds of horses were allowed to compete in them, and awarded premiums. Objection is made to Canadian horses as too small for heavy work, but this defect, if it exists, would be easy to remedy, by careful selection, and attention in breeding. But as an article for sale we should we see them so much sought after in the raise a pure breed of Canadian horses when United States. Parties may boast of obtaining high prices for tall horses of other breeds, but we feel persuaded that no breed of working horses will pay their owners better for what they cost them, than the pure breed of Canadian horses. There are very many small horses through the country certainly, but the cause of this is carelessness in breeding, and insufficient keep. In every parish in Lower Canada, the very best Canadian stud horses should be kept for breed, and all the County Agricultural Societies should give every possible encouragement to the best stud horses of

pure breed. We have seen stud horses brought into Canada that were worthless, compared to stud horses we had in the country, and the latter neglected, to the great injury of farmers. We have had frequent opportunities of seeing how highly the people of the United States value the real Canadian horses, even when very much under-sized. Other descriptions of horses may occasionally be required for the carriage, for the saddle, or other purposes, but what signifies the number that would be required for these purposes compared to those for working, and to supply the demand from the neighbouring States, who do not want to buy horses here for the carriage or saddle? It is very proper to introduce new breeds of animals when those we have are bad and worthless, but it would be absurd to introduce unsuitable and inferior animals, when we have better of our own. The Canadian sheep and swine, are of inferior quality, and require very much to be improved. The Canadian neat-cattle, however, are very susceptible of being made a valuable stock, and very suitable to our present state of agriculture. When this would be improved, the cattle would be sure to improve with it; sufficient keep, careful breeding and judicious selection, are what is requisite to make Canadian neat-cattle, a most profitable stock for most farmers.

#### AGRICULTURAL REPORT FOR MARCH.

March commenced with high winds and cold weather, and up to this period, has maintained the usual character of that month, windy and changeable. We have had frequent falls of snow, but on the whole, there is less snow now on the fields than at the commencement of the month. There is, however, a considerable quantity of snow yet on the land, and we can scarcely expect all will disappear early in April. We think it favourable to agriculture that the snow should cover the land to the end of March, but the sooner we have spring after the first of April the better, as it

admits of farmers putting in their seed in good season. The best wheat and oats we ever raised in Canada, were sown the first week of April, but this was previous to the appearance of the wheat-fly. This insect has done immense injury to Canada, and we have no doubt is the chief cause, although not the only one, of the present depressed state of the country. It may be imagined what would have been the consequence to England, had she been unable to produce good crops of wheat for the last fifteen years. We can safely say, that the loss of the wheat crop to Lower Canada, in a pecuniary point of view, was fully as severely felt to the farmers here as it would be to the English farmers, because the latter are not so dependent upon the wheat crop exclusively, as the farmers of Canada were. We were not altogether prevented growing wheat, it is true, but for ten or twelve years only a very small proportion of wheat was grown here, compared with what might have been grown were it not for the wheat-fly. The last three or four years the Black-sea wheat has been grown to a considerable extent, but the necessity of late sowing has rendered the crop rather precarious, unless the season is very favourable. If fall wheat had been sown last year it would have had a good chance by a deep covering of snow. We believe that fall wheat might be successfully cultivated here, provided it was sown early in the fall, (in August,) and covered properly, or sufficiently. It would be a great advantage if farmers could sow a part of their wheat in the fall, but unless sown early it would be useless to try it. The lands of Upper Canada, were, we understand, much exposed the past winter to severe frost, with very little snow. It cannot yet be ascertained what effect this may have on fall sown wheat. The wheat plant is very hardy, and where it has taken good root from early sowing, and the soil is well drained, it may not suffer any injury. The great danger is in the spring, when the soil is becoming thawed, that the roots are

liable to be thrown out, and many of their fibres broken and torn asunder, by the action of alternate freezing and thawing. In dry soil, however, this will not be found so injurious. The steady winters of Lower Canada, we conceive, are much more favourable for the country than the changeable winters of Upper Canada or the neighbouring States. We are not so liable here to unseasonable frosts in the spring or fall as they are elsewhere, and this is a great advantage, as young crops after appearing over ground are always more or less injured by frost, if subjected to it. In like manner, early frosts in the fall are most injurious to crops if it comes upon them before they are at maturity. We are certain that crops suffer more from these causes in other parts of North America than here, with all our depth of snow and long winters.

The moment the land is in a fit state for working, sowing should be commenced. Farmers might venture to sow some of the old varieties of Canadian four months' wheat, if sown early in April, but perhaps it might not be well to try it to any great extent lest the fly should injure it. The Black-sea wheat might also perhaps be sown early, but we shall not take upon us to recommend the general sowing of this wheat previous to the 15th or 20th of May. We know the fly is still in the country, and if by sowing early the wheat would be greatly damaged by the insect, it would be a serious loss to farmers and to the country. Oats, peas and beans, may be sown as early as the soil can be harrowed, and potatoes should be planted early. We suppose that farmers are aware now that applying large quantities of recent manure makes the crop of potatoes more liable to disease, and that they will be cautious, in planting, in applying manures, to use those that are known to be the least objectionable. Charcoal, soot, ashes, salt and lime, are all favourable to the production of potatoes that will keep sound. We should not be covetous to raise very large crops that may rot before

our eyes, and that in any case are not so good for the table as moderate sized potatoes. Charcoal, we believe, is one of the best substances that can be put in the drills with the seed, with any other of the above subscribers that may be applied. Dry soil is the most suitable for potatoes. The plan of sowing Indian corn, or beans, in every alternate row with the potatoes, we conceive to be a good plan, and we believe, by whatever means the effect is produced, that it has a tendency to preserve the potatoes from disease. Potatoes are too valuable and too necessary to us, not to deserve all our attention, in order to grow them, and secure them from disease, if possible. The varieties of potatoes that are the least subject to disease, should be those planted. Those known as cups we have found to keep as well, if not better, than any other; but it would not be well to be confined to one, two, or three varieties. Potatoes should be planted immediately after they are cut, and covered at once. It is well to mix lime or gypsum with the sets after they are cut, and previous to planting, and to wet them sufficiently to cause the lime or gypsum to adhere to the sets. The practice of sowing peas and oats to a certain extent for the farmer's own stock is, we believe, a good one. We have seen them ripen very well together. The small white or grey pea, mixed with the oats of the country, will generally come to maturity together. But even should they not do so exactly the loss will not be great. The farmer will find that sowing in this way the produce will be larger than if the crop was unmixed, and the straw will be excellent for fodder. Tares, or vetches and oats, we have frequently sown together, and they produced most luxuriantly, and were good food for stock. Farmers' cattle and sheep are often much stunted in grass in July and August, and if they would sow some vetches and oats mixed, or oats and peas to be cut and fed out at the time the pastures begin to fail, it would be of great benefit to the stock, and profit to the farmer.

Clover or lucerne would answer the same purpose, and so would Indian corn, or Rye sown thick and cut down green. There are many improvements in the farmer's power that would not be expensive, and would pay well. Even one acre of any of these crops we have mentioned, to be cut down green in the latter end of July and August, and fed to a farmer's cattle, would be a great advantage, and keep the cattle in good condition until they would get the after grass, or until the pastures would be improved by the fall rains. We would observe here, that pastures well stocked with the roots of grass, and forming a close swarth of grass, are not much affected by drought, but will keep good when our common pastures that are only of one year's standing and not seeded down will be affected at once by drought. The sowing of barley may be deferred until after the first of May, or until the weather has become warm. It is generally supposed, and very correctly, that the surface of well ploughed land is much ameliorated by exposure to the effects of the winter frosts, and are much better prepared for causing the seed to produce a good crop than if the same soil was ploughed immediately before sowing. The best plan is to use the scarifier or grubber, with land ploughed the previous fall immediately before sowing, and thus effectually loosen the soil without turning down the surface that has been ameliorated by the frost of the previous winter; and then drill or harrow in the seed, never covering it very deeply, one inch being sufficient for barley. Land fresh ploughed in spring is more disposed to run together after rain, and to form clods or large lumps if the weather should prove very dry; but land which has already had the action of the winter's frost and atmosphere upon it, is not so disposed to cohere; and the scarifier or grubber, by leaving this surface soil uppermost, renders it less susceptible of doing so, or of becoming very hard. There is no species of grain that requires a more thoroughly drained soil than

barley, unless where there is an open subsoil. It is a most tender grain in the early stages of its growth; a dry subsoil and fine state of tilth are necessary, and prevent injury from a succession of heavy rains and cold weather after it is sown. There is an old adage that barley never succeeds well "if the land drains run after it has been sown," and we have proved that this is a correct adage in Canada. It would be better to defer the sowing of barley unless the soil is in a fit state, and when the season is moist, the rolling should be deferred for twelve or fourteen days after the grain is sown. This great care in the cultivation of barley is the more required, as unless the seed comes up evenly and together, it will not mature together, and will never make a good malting sample. The washing of the seed, and skimming of the light floating grains, and steeping the seed in liquid manure, and drying it with lime or ashes previous to sowing, is a very good plan, but it should be sown immediately after this preparation, and if not, spread thinly on the barn floor until sown. Barley is the best grain to sow grass seeds with in laying down land. At all events, any land fit to produce good barley, will certainly be in a good state for laying down for meadow or pasture. In England, barley was considered as the king of all crops, having too much pride to follow any other white straw crop, or allowing any one to follow it. From the experience that farmers have acquired in the sowing of wheat early and late, we can scarcely take upon us to advise them on the subject, as both early and late sowing have been adopted and succeeded. The safest plan, we would imagine to be, to make experiments this year also of early and late sowing, and not risk sowing the whole at one period. The state of the spring and of the soil should be a guide to us in sowing, to a considerable extent. If we find both favourable, very early, it would be a pity to allow the opportunity to pass without sowing. We should have no hesitation in sowing provided

we could do so previous to the 15th of April, and take our chance for the fly. The most dangerous time for sowing is from the 15th or 20th of April to the 20th of May. We know that good crops of wheat may be grown here, sown about the 20th of May, and they are not liable to be injured by the fly. The sowing should not be put off for a moment after this time, as the weather generally becomes warm and dry, and greatly checks the progress of the young wheat plant when sown very late. In every case, the seed should be washed in a strong pickle, and the light grains taken out previous to sowing. If mixed with any seeds of weeds, mustard or wild pea, they might be separated with a wire sieve; and certainly there is abundance of these seeds in most of the lands without sowing any with our grain. We need not remind farmers how much consequence it is to have the soil in good order for every description of crop. To have it well drained, and sufficiently pulverised, to admit of the roots of the seed extending freely to obtain the necessary nutriment. The poor, thin crops we so frequently see here, result from sowing on land that is not sufficiently drained or dry when sowing, more than from mere exhaustion of the soil. It is also a necessary consequence of badly drained soil that it cannot be properly ploughed or harrowed. All parts of the cultivation of the soil are so connected with each other, that if any part of the process is imperfectly executed it affects the whole, and prevents the proper execution of the other parts. Insufficiently drained land cannot be properly ploughed, and ill ploughed land never can be well harrowed, until again ploughed. Thus it is in every branch of husbandry, one error or imperfection produces many others; and unless there is a regular system adopted and carried out, no profitable or valuable returns can be obtained from agriculture. This, that, or the other farmer, may by chance in a favourable season or other accidental circumstances occasionally obtain a good crop, but

to succeed in raising regularly good crops, or other things, a proper system must be adopted and as regularly carried out. When this is done, good crops will generally result from good cultivation, unless in very adverse seasons, and we may be thankful we have not many of these in Canada. In sowing peas we believe it would be found to succeed well, to form small furrows with the plough previous to sowing, the seed will fall into these furrows in harrowing, and the crop will generally be stronger and better. Indeed there is little doubt that sowing all descriptions of grain in drills of proper depth would be advantageous, as the seed would be evenly covered—of a uniform depth—the straw would be stronger—and the ear and grain larger and fuller. Carrots, Parsnips and Mangel-Wurtzel, should also be sown as soon as possible, steeping the seeds in liquid manure previously.

March 27th, 1850.

We give in this number the Report of a Committee of the Legislature of the State of New York, on the subject of an Agricultural College, Model Farm, &c., which we recommend to the attention of our readers. It appears from this document, they are determined in that great State, to provide the same advantage for agriculturists, that other classes have had long ago. It is a most extraordinary fact that considering the agricultural class constitutes so large a majority, both in the United States and in Canada, this essential requisite for the due instruction of young agriculturists, should have been so long neglected. If agriculturists had been properly alive to their own interest, they had it in their power at any time, in either country, to have insisted upon such establishments. The want of them has unjustly deprived the majority of the people of the best means of instruction, that the minority has always had; hence, the chief business of the country, and that upon which the prosperity of the country mainly depends, has had

no fair chance of advancing in improvement, as other employments or professions had. The most suitable means of education and instruction has been provided in schools and colleges for all other professions, except for agriculturists. In all the Reports of the Common School systems of this country, there is scarcely ever to be seen one line relative to an agricultural education, or the necessity for it. It would appear as if the subject was unworthy any consideration whatever by those who are entrusted with the education of the people. We imported, in 1848, on behalf of the Lower Canada Agricultural Society, several small agricultural works, in the hope that they would be introduced here as school books, making such alterations and modifications as would be necessary to make them suitable for this country—and translating them into the French language. For this, an arrangement might be made with the authors of these works, to allow their republication here. No action, however, has been taken in the matter, and these little books have been allowed to remain no better than waste paper, upon the table at the Agricultural Room, up to this time. The selection we made was very limited of course, as we only were desirous of showing that suitable books for schools might be had. There are very many agricultural books that might be introduced in schools, and that would not require a school-master who was a perfect agriculturist, to explain them to the scholar. We know many such books that are quite as suitable for schools, as any we have ever seen in any catalogue of school books. By inducing, or at all events affording an opportunity, for our youth to read works on agriculture, it might create a taste or desire to be better acquainted with the subject, and in any case, it would not be estranging them from the business of their fathers, and attaching them to any, to the most useless, or perhaps, to no profession, rather than that of a farmer. It is time to see an end of this inconsistent, and

injurious absurdity. If any education is provided for the rural population, let it be of the most useful possible character for them, if they are to pay for it. Objections may be urged to the establishment of Agricultural Colleges and Model Farms, by those who are either unfriendly or indifferent to agriculture, but there cannot be any reasonable objection offered against the introduction of books relating to the science and art of agriculture into our common country schools. We shall answer for it that they will do much less harm to the pupils than many books that are permitted in schools. Agriculturists are most unjustly accused of being slow to adopt improvements, and as being behind the age and other classes. But while every possible aid, by suitable education and otherwise, has been abundantly provided for all other professions, agriculturists have been neglected, and no suitable provision made for their instruction—no more than if it was a useless or injurious profession to be employed in. Those who understand the true position of this country, and who wish to see it in a thriving and prosperous condition, will not oppose the establishment of Agricultural Colleges, Model Farms, and all other aids calculated to promote the improvement of agriculture, by a perfect and practical knowledge of it in all its branches. The expenses of such establishments are comparatively nothing, compared with the immense benefits they would produce to the country. By what other means, we would ask, could the annual produce of the country be doubled, except by her agriculture? We have no hesitation in saying that the agricultural produce annually created might be doubled in amount and value, by a more perfect system of agriculture. By what extent of commerce, trade, and manufactures, could we derive the same amount of benefit annually? All these latter are very good in their place, as the consequences of a prosperous state of agriculture, but unless they are based upon this foundation,

they cannot be permanently successful or profitable to the country generally. Numerous plans and speculations may be proposed for promoting the prosperity of Canada, while the principal means that is in our power is neglected. The judicious cultivation and management of land and stock would be a more certain source of wealth and prosperity to this country than if we were to find the most valuable mines that exist on this continent. There is a limit to the value of mines, but the produce of agriculture will be always in demand, while mankind continue rapidly to increase. A productive and prosperous agriculture necessarily creates manufactures and trade for the supply of agriculturists, and this is the most natural, the most healthy, and the most happy state of any country, and for this, in particular. The "Associations of Agricultural Credit," which we have so frequently brought under consideration, we hope, will find supporters in all true friends of this country. We do not fear the fullest discussion of the subject, and enquiry as to its working in countries where long established. It is not giving agriculturists a fair chance to deny them any reasonable aids to improve their condition. This vast country, of superior soil, is in a comparatively waste state, for want of capital to draw forth its treasures from the soil. If we are to take example by the progress of improvement of agriculture in other countries, we shall see that these improvements are only produced by the application of skill and capital. We must improve by similar means, or we must ever remain in a backward state, and see all our natural advantages going to waste before our eyes, without being able to make any use of them.

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T. B. Johnston, Esq., Secretary of the New York State Agricultural Society, has very kindly sent the Lower Canada Agricultural Society, a "Prize Essay" on Indian Corn, a "Report of the Commissioners appointed to

mature and report a plan for an Agricultural College and Experimental Farm"—a copy of Professor Johnston's Lecture at Syracuse, and a small parcel of Broom Corn Seed—for which we have been instructed to return thanks to Mr. Johnston, a duty that affords us much satisfaction. The seed will be distributed to members of the Society, and we hope that Broom Corn will be extensively cultivated here soon, as we are certain it would at present prices be a very profitable crop. Mr. Johnston has also offered to send the L. C. A. Society, copies of Essays that have been published by the N. Y. S. Agricultural Society, should he find opportunity; they would be very acceptable, as no doubt, they are valuable.

To another gentleman in the State of New York, C. N. Bement, Esq., we have also to offer the thanks of the Lower Canada Agricultural Society, for his excellent work, entitled the "American Journal of Agriculture and Science." We have not yet had time to examine it sufficiently, but from what we have seen of the work, we estimate it highly. It is very satisfactory to have to acknowledge such friendly presents from Agriculturists, and we shall be happy to make any exchanges at our disposal, if considered of any value, by parties who may be disposed to send us Agricultural Books or Periodicals for the Library of the L. C. A. Society. We cannot boast of a large library, but we certainly have as good works as are in print on the Science and practice of Agriculture, in books and periodicals. If a useful Library is required, a few well selected volumes will be much more valuable, than to purchase books by the foot to fill up a parcel of shelves, that are of little use but for ornament, if they are well bound and gilt. There are many agricultural works that only contain a very small proportion of useful information, and practical instruction for farmers. A well instructed, Agriculturist may find useful information in almost any work published on agriculture, but a farmer who has

his business partly to learn, may be led into serious errors by works that are not plainly practical, and written by parties who understand their subject. Above all things, authors on agriculture require to understand the subject practically, or they will be sure to be in error frequently, however talented they may be. We often see exaggerated statements published, that can have no foundation in fact, and this is one cause that book farming has so little credit with farmers. It is very necessary that parties who become authors on agricultural subjects, should be most cautious in publishing any statements that they are not convinced to be facts. If they do otherwise, they should state the matter simply, and acknowledge that they are not acquainted with the matter, but submit it for consideration.

It will soon be time for the Lower Canada Agricultural Society to take some action for the proposed Cattle Show and Exhibition to take place at Quebec next fall. Unless this Exhibition is to be worth seeing, it would be better not to have any. The city of Quebec will doubtless contribute handsomely towards the funds necessary for this great Fair. The Legislature, we hope, will grant a liberal aid to this undertaking, in order that it may be worthy of the country, as well as useful to the progress of improvement. The collections that might be made for entrance, to the place of Exhibition, would also assist to meet the necessary expenses. The County Agricultural Societies should all lend their aid, as the whole country may participate in the benefits of such an Exhibition. Every section of Lower Canada will have easy access to Quebec with their stock and produce, and we hope steamboats and rail-roads will be liberal, and make the most moderate charges in all cases. The Exhibition, if what it might and should be, would be productive of much good. It would bring the best samples of every species of domestic animals together, and afford an oppor-

tunity of estimating their comparative merits. It would bring samples of our manufactures of every description before the public, and show what we are capable of doing. For samples of grain, a sufficient amount of premiums might be given fully to compensate the owners, and allow the samples to belong to the Society for distribution for sowing, on such terms as might be thought expedient—thus securing all the advantages of picked samples for seed for those who might not have any good seed. Unless this plan is adopted, it might be better not to offer any premiums for samples of grain. The regulations and conditions for the Exhibition should be such as to secure advantages to the public, fully to compensate for any aid granted the Society from the public funds. The sole object of the Exhibition should be to promote the improvement of our agriculture, and to give encouragement, as far as possible, to Canadian manufactures of every description that are useful, and that could be made here as cheaply as we could import them. If the inhabitants of Canada are actuated with the desire to advance the welfare of the country to the same extent that the people of the neighbouring States appear to feel, we should be able to have an Exhibition at Quebec next fall that would be as interesting as that we had an opportunity of seeing last year at Syracuse, although, perhaps not so numerously attended.

It would be very desirable to have a Museum of agriculture implements (we have already, seeds, plants, &c., established in Montreal.) It is, we conceive, very discreditable to a country so decidedly agricultural, that we should be without a Museum. Who are to blame for this want, or who should supply it? We could reply to this, but we submit it to the consideration of others, only observing, that upon whomsoever the duty devolves, the Museum should be provided, if agricultural improvement is desirable. There is another great want in our fine city of Montreal. A Botani-

cal or Public garden, for which the soil, situation, and climate, are so very favourable. The people's attention appears to have been fully occupied in extending streets, and building houses, without ever thinking of providing a beautiful garden for the pleasure, health, and instruction of the public. Montreal is a city of fine houses, and with, perhaps, a population of 50,000, and there is not a public garden, or a suitable promenade of any description to pass an evening, unless upon the dusty and heated streets. We are always thankful that our lot has been to live in the country, where the beauties of nature cannot be hid from us by walls of stone or bricks. We cannot help imagining that the fact of their being no public gardens, or walks shaded by beautiful trees and shrubs, in or about Montreal, is a proof that agriculture or the country is not held in much estimation by our citizens. There are many beautiful *private* gardens, and shaded walks about Montreal, but what are these to any but their owners? The poor man, or the mechanic, can never set his foot there. In many parts of Europe private gardens are open to the public, and without any injury to the owners, and there is scarcely any city without public gardens, and public walks. Parties do visit the Mountain near Montreal, but we believe they cannot do this without its being considered a trespass on private property. The mountain would offer beautiful walks, if it were public property, and judiciously laid out, and improved. It may be thought we have nothing to do with these matters, but we conceive that the establishment of a Public Botanical Garden, with every variety of trees, shrubs, and plants, would be exceedingly advantageous to Agriculturists, as well as to the inhabitants of the city; and there cannot be any doubt, that public walks shaded with beautiful trees, and shrubs, (not the unsightly Lombardy poplars,) would have a very beneficial influence upon our citizens, and interest them for the improve-

ment and prosperity of agriculture, and attach them to the country.

Leaves and small branches of trees, with the leaves on, and while full of sap, are said to be excellent manure, and they must be so, containing as they do the most fertile ingredients that can be extracted from the soil, and the atmosphere. In this country what a vast amount of manure might be obtained where the forests are convenient. The young tender shoots and branches might be collected without much expense, and by placing layers of them while fresh and green, in the compost heap, we have no doubt they would enrich the compost as much as the same quantity of farm-yard manure would do. It is only at a certain period that those shoots and branches, can be made available, while they are young and soft; when they become hard, though they may contain manure, they will not rot or decay so readily in the compost heap. Lime should be mixed with the compost, when shoots and soft branches of trees and shrubs are put into it. Considerable assistance of manure might be collected by the industrious farmer, who would be convenient to the forest, as there are many plants which might be cut and carried to form compost for future use. They should be covered well, or mixed with earth immediately, on being cut, before they would wither or dry. In the dry and barren sands of Holland and Belgium, they plant trees for the purpose of improving the soil, and when they arrive at the age of about 25 or 30 years, the trees are cut down and disposed of, and the poor land is found so much improved by the trees, and fallen leaves during this period, that it is capable of producing good crops of roots and grain. In fact, the nature of the soil appears altogether changed, and is no longer pure and barren sand, but appears largely mixed with a better quality of soil. Every means of obtaining manure should be resorted to by the industrious

farmer. In applying compost containing small branches, as top-dressing to meadows, should any of the wood of the branches remain undecayed, they could be very readily raked off the land, when spread and bush harrowed. We stated in a former number, that small branches or brush wood cut while green, in the fall, and spread over grass or ploughed land, and allowed to remain upon it until the spring, would greatly improve the soil, and they might then be gathered off and burned or charred for manure. This plan would of course give some trouble, and take some time, but where there is a difficulty of obtaining manure, it would be better to try this plan, than allow the land to remain incapable of producing crops. It is not in every situation that branches and brush-wood could be had, but certainly in many places they might be had, and the cutting of them will be as useful to the place they grow, as their spreading upon the land would be where applied as a manure. Whatever cause it may proceed from, there cannot be a doubt that spreading branches on land as we propose, is beneficial to it, whether it is by the shelter they afford, or some ingredients they part with that improves the soil. We have frequently seen this effect, though we have not seen the branches regularly applied to produce this effect as we now propose.

We have seen it recommended by very good authority, that all seeds before sowing should be steeped, until saturated, in liquid manure, of sufficient consistency to form an adequate coating for each grain, no more being suffered to adhere, than is actually required, in relative proportion to the species, as too much action is over exciting to the delicate sprouts under an artificial system. The process is peculiarly beneficial with respect to spring wheat, peas, beans, barley, carrots, beet, and early potatoes. Under operations of this nature, and with prudent management, great advantages will be

gained, in the early vegetation of the seed, and coming rapidly forward, in advance of grass or weeds, if there are any in the soil. Seed thus prepared, and put into soil that has been cultivated and manured suitably, will have every chance of success. Very dry and warm weather after sowing, might perhaps check seed that was steeped, but under good management, a farmer will seldom have to repent steeping the seed in liquid manure previous to sowing. These matters are not to be neglected, and when farmers do not attend to them, it shows a carelessness and indifference by no means creditable.

With a good chaff-cutter in the old country, one man is said to be able to chaff hay sufficient for 18 head of stall-feeding cattle in two hours, allowing from 21 to 28 lbs. weight for each. It would be interesting to know if hay can be chaffed with the same ease and expedition with us, by any of our machines. The chaff does not require to be cut so short for cattle as for horses, but the statement we have seen does not say what length the chaff was cut to. It is generally admitted that chaffing hay for horses, cattle and sheep is a great saving, and prevents much waste, but we are not so confident that chaffing straw is a judicious plan, unless to mix with horse food. The saving of straw is no consequence, or should not be, where what the cattle rejects or wastes, goes into the manure. Straw would not, therefore, we conceive, repay the expense of chaffing it. We have heard of oats being cut into chaff, attached to the straw, without thrashing, for horses, and we believe it to be a very good plan, and that it might answer well for cattle also. In all cases that chaffed hay or straw is fed to animals, they should have roots or soft food occasionally supplied to them, to keep them in health.

We have much satisfaction in assuring the Members of the Lower Canada Agricultural Society and their friends, that we are constantly

receiving unquestionable testimony of the great interest created throughout the country for the improvement of Agriculture. There is a most anxious desire manifested for the establishment of Agricultural Schools and Model Farms, where the youth of the country would receive a suitable and useful education, and be instructed in the practical art of Agriculture. From every section of the country where the *Agricultural Journal* is sent, the most encouraging letters are received of the good it is producing, by creating a spirit for enquiry, and an anxiety to introduce a better and more profitable system of farming. This is exactly the object of publishing the *Journal*, and we confidently hope that the Society, at whose instance it is published, will not be disappointed, but will ultimately have the satisfaction to see their laudable and disinterested efforts for the good of the country successful beyond their most sanguine expectations.

We have to apologize to our subscribers and the members of the Lower Canada Agricultural Society, for our neglect in not referring to the Rules and Regulations of the Society, before we gave notice, in the last number of the *Journal*, for the Annual General Meeting of the Society, to take place on the 15th of March last. We had forgotten that the Annual Meeting was only to take place during the Session of the Provincial Parliament. This Rule was made in order to have the benefit of the presence and advice of the members of the Legislature at the Annual Meeting. There was no idea at that time of the changes that have subsequently taken place. The meeting did not, of course, proceed to any business. When Parliament meets, notice will be given for the Annual Meeting of the Society, and then the Rule may be altered so as to admit of the Annual Meeting taking place whenever the Society may think proper. The Directors and Officers elected at the last Annual Meeting remain in office for the present.

We have been much disappointed by not being able to procure a satisfactory translation of two or three valuable communications, which appeared in the March number of the *French Agricultural Journal*, and which we expected should appear in the April number of the *English Journal*. We find it much more difficult to make a good translation of French into English, than of English into French. We hope our respected correspondents will write to us in English the next time, and we shall have no difficulty in translating into French. We still expect to be able to have a good translation, in English, of some of the correspondence which appeared in the last *French Journal*.

We have received a letter from a Subscriber at Eaton, respecting the Course of Agricultural Lectures delivered at Albany, in January last, by Professor Johnson. We beg to acquaint him, that we have requested copies of those Lectures, when published, and when we receive them, we shall be better prepared to reply to his further enquiry. In the meantime we shall see what would be the charge for 100 copies of the Lectures, by the publishers at Albany or New York. They could not fail to be most valuable for circulation.

Common, or the most inferior oil, is said to be a good top dressing for heavy clay land under meadow—40 gallons is mixed with 120 bushels of screened soil, and the mixture is allowed to remain for one month before it is applied. It is said to be equal to 40 bushels of bones and 80 bushels of burned soil, as top-dressing for an acre.

TO DRIVE AWAY RATS.—Mix one shilling's worth of Spanish flies in a bottle of the best French brandy; cork it well, and after shaking deposit the brandy in smocking dung; let it remain six weeks, and it will be fit for use. A few drops of this liquid is said to entice them from their holes into any kind of trap you may choose to employ. I have not used the remedy myself, but it is well worth a trial.—*A Subscriber.*

## STATE OF NEW-YORK.

*In Assembly, March 1, 1850.*

## REPORT

Of the Special Committee on the Agricultural College and Experimental Farm.

The select committee to which was referred the Report of the Commissioners appointed to mature a plan for an agricultural college and experimental farm, and so much of the Governor's message as relates to the same subject, together with the memorials and petitions of various boards of supervisors, and agricultural societies and private citizens in favor of the same object, have had the subject under consideration, and submit the following

## REPORT.

The great subject entrusted to the care of the committee, has for several years past excited a deep interest throughout the entire State. Twice the distinguished citizen who now fills the Executive chair, has pressed it upon the consideration of the Legislature; various boards of supervisors, agricultural societies and private citizens have called upon us to act in the premises. The Committee on Agriculture in the Assembly of last year, submitted to the House an interesting report upon the subject, which will be found in their documents. The able board of commissioners last year appointed by the Governor, have matured and reported a plan for an agricultural college and experimental farm, and the same is now upon our files. Public opinion still moves on in the same direction and with accumulated power. It would be but a waste of the time of this committee, and wearying to the patience of this House, again to go over the ground embraced in those reports. The most ample justice is therein done to the importance of the object contemplated, the present state and past history of similar institutions, the branches of knowledge to be taught, and the expense and general outline of the institution.

It seems necessary for this committee now, only to present a few brief considerations, which seem called for by the nature of the bill which they ask leave to introduce.

The committee with entire unanimity assent to the correctness of the conclusions arrived at by the said commissioners, that such an institution as has thus been called for by so wide spread a public opinion, should be established, and that the same should be founded by the State. The necessity for its existence is found in two very important facts, the first is, that two-thirds of the entire population of the State is engaged in agriculture, it is the great occupation of our citizens and the primary source of our wealth, and must so continue through all future time. Whatever adds to the value or the dignity of labor, tends to the elevation in comfort and

respectability of the great body of the people. A very slight increase throughout the State of the productions of the earth, will *annually* return to the people more than the entire amount which will be expended on the proposed institution, should that sum even exceed any contemplated bounds.

The second ground for its necessity is found in the most remarkable fact, that while a very large majority of the inhabitants of the Union are engaged in agriculture, while it is everywhere regarded with respect and held in the highest favor, there is not upon the continent a solitary institution where a thorough scientific and practical knowledge of agriculture can be obtained. Millions have been expended in founding institutions to teach law, theology, and the higher departments of science and literature; and even the blind, the insane, and the deaf and dumb have not been overlooked and forgotten. But that great science which lies at the foundation of all others, and is paramount in importance to them all, has been left to struggle along as best it might, guided by the flickering light of an uncertain experience, and unaided by the fostering care of the government which it sustains. The results of modern improvements, and the progress made in the present century, in the science of agriculture, demand at the hands of the State the most favourable consideration of this subject, and that this great desideratum should be supplied without further delay. The great farming interests of this State have too long been overlooked and forgotten, or sacrificed to the interests of more artful or more clamorous bodies. But now when their wants are understood, and their requests are duly presented to our consideration, they are too reasonable to be longer postponed. To this point the attention of your committee has been earnestly directed. We have been urged instead of following the recommendations of the commissioners above referred to, to advise the establishment of agricultural departments attached to some of the present literary institutions of the State. And various reasons have been presented to our consideration, in favor of this plan; but your committee have been entirely unable to satisfy themselves that this course would be wise in itself, or satisfactory to the people of this State. All the memorials referred to your committee from whatever sources they may have emanated, as well as the reports and recommendations above alluded to, concur in favor of "an agricultural college and experimental farm." Public opinion has been directed to this mode of accomplishing the desired end; and seems to your committee to have concurred in it. They have been unable to discover from any source that the course first above referred to, would be in accordance with the wishes of any considerable body of our fellow citizens, unless it be those

who represent the interests of institutions already established.

But in addition to this, while we have been unable to discover any very cogent reasons in favor of attaching agricultural departments to existing institutions, we are clearly of the opinion that there are unanswerable objections to any such course. We will refer to but a few of them.

An experimental farm we regard as an indispensable feature to the enterprise; but if an experimental farm must be attached to each of even four institutions, this item of expense alone would nearly if not quite equal all the expenses of an independent college.

But further, if the advantages of these several institutions were to be at all comparable with those in an independent institution, it would become necessary to maintain *in all*, twice the number of professors which would be required in one college, and still the advantages would not be equal. There would also be an additional expense in buildings, chemical apparatus and libraries adapted to the wants of the students. On the ground therefore of expense only, we are in favor of one independent college.

Another objection, which is not without its weight with your committee, consists in the fact that an agricultural department so attached would be but a secondary object, in comparison with the main design of the institution, and would not receive from the trustees that degree of attention which its high importance demands. It would not be the object for which the institution was founded, and would not probably enlist the warmest sympathies of its trustees and friends.

Being regarded too, rather as an *appendage* to an institution than the thing itself, and thrown into the back-ground in point of importance, it is very much to be feared that relations of perfect equality and friendliness might not always be preserved between those who pursued alone the classical departments, and those who daily pursued the science of practical agriculture by laboring on the farm with their own hands.

But perhaps a more serious objection than any yet referred to, may be found in the fact that far great advantages could be enjoyed at a single college than by agricultural departments attached to any number of institutions. The experimental farm, the library, the chemical apparatus, the stock of animals, the implements of farming, and all other appendages be on a broader scale, on each student would enjoy the benefit of the instructions of professors and teachers in every department within the range of their studies.

Your committee also feel that as the institution will be founded for the benefit of the paramount interest in the whole State, it should be

a State institution, established, governed, and in all things regulated by the people of this State.

For these reasons, thus briefly alluded to, and others which will readily present themselves, your committee have felt bound to recommend that no money should be appropriated for the establishment of agricultural departments in existing institutions, but that one independent institution should be founded and governed, and so far as necessary maintained by the State.

To carry out this great object, which seems to your committee one of the most desirable and important which can be presented to our attention, we herewith present a bill. The objects arrived at by its various provisions are too manifest to require an explanation in this report. We therefore conclude by earnestly commending the bill proposed, and this whole subject, to the most favorable and earnest consideration of this House.

All of which is most respectfully submitted.

Sec., &c.

ON FLAX GROWING—The season is now advancing when Flax should be planted, I think it well to let the public know the result of my last year's crop. As far as I can inform them, I grew about twenty acres on my own farm, and took about twenty four acres more, the expense of tillage and harvesting the crop; was increased by the flax not being planted quite early enough, being obliged to do it in the midst of harvest. The cutting and tying cost 12s. and 14s. an acre, and I am paying 6d. per bushel for thrashing. The yield will be quite twenty bushels an acre. On a farm adjoining where an acre was planted, it was twenty two—on one more distant it was twenty four bushels. I have sold the seed for cattle feed at 6s. per bushel, and, when well cleaned at 6s. 6d. per bushel. I planted mostly Riga seed which yielded best, and is now the finest seed. I found great difficulty in separating the small seeds from the flax, but now with Gooch's winnowing machine I can do it effectually, and as the demand for sowing is so good in this country and in Ireland. I have reserved all I have for that purpose; I strongly advise its being sown the end of March; however, with light harrows, endeavouring to move the ground previous to sowing, to prevent the growth of annual weeds, I have not begun working up the fibre, but, from the dry spring the straw is short; but if it only realized £3, or £4 per acre, after all expenses, what grain crop will pay like it, seed and fibre included: the use of flax is being increased daily, and with the many millions we pay yearly for foreign flax we need not fear over-stocking the market.  
—Mark Lane Express.

**ALLUVIUM.**—The name given to beds of mineral and other matters deposited and now depositing from water, chiefly at the mouths of rivers.

The surface of the earth in its natural condition is covered with the soil, which gardeners call virgin earth or vegetable mould. This is derived partly from the natural decay of the subjacent rock, assisted, according to Darwin—and there can be no doubt of it—by the castings of earth-worms, which are constantly sifting the finer from the coarser soil; and partly from the decay of plants which have grown upon it. It is generally of a very compound nature, consisting sometimes of all the earths and other metallic oxides, mingled with substances of animal as well as vegetable origin. This loam or vegetable mould is formed over the surface of all sorts of rocks—over every geological formation in fact—and it generally exhibits the prevailing character of the subsoil on which it rests, and is calcareous, silicious, or aluminous, according as the latter contains lime, much sand, or much clay. An alluvial soil, on the other hand, has no connection with the rocks below it: it has not been from *their* disintegration, but from that of rocks at a distance that it has been derived: it is a transported soil. Alluvial soils generally consist of all the mineral, vegetable, and animal substances which moving waters have gathered in their course through districts of various geology, and which, held in suspension, they have transferred from the higher to the lower ground, and deposited on becoming sluggish or still. The action of rivers is no doubt one principal cause of the formation of alluvial rivers: we see this operation proceeding now on the low lands at the mouths of large rivers near the sea; and when ever the influence of a constant tidal current setting along the coast is joined with that of a large river discharging its muddy contents, extensive deposits of earthy matters are now forming. The distinguishing structural characteristic of these deposits arises from the mode of their formation; this is not continuous, but intermittent: each tide leaves its contribution, to be somewhat indurated by exposures before the next shall be laid above it—the mass is thus made up of many thin layers, almost like the leaves of a book. The mode of this deposit may be seen artificially exhibited in the progress of warping in Lincolnshire and Yorkshire, where the muddy tidal waters are imprisoned and literated in regular alternation; the mineral matters they hold in suspension settling during the intervals.

Alluvium may be formed of a clay mud, or of fine sand or silt, or of a mixture of both, and the layers of these two may alternate, according as winds vary and the sea currents from different quarters set in; this is particularly the case on the banks of the Humber. Clay is more

easily disintegrated than any other mineral, and therefore always occur abundantly in every alluvial soil; marly, and all the newer calcareous rocks as the oolites and chalk, are easily washed down, by the rains and carried off by rivers; sandstone and trap rock containing clay and lime, those granites also whose felspar, contains the alkaline silicates in abundance, are easily decomposed by the rain-water and other atmospheric agents, and all their finer ingredients are carried by the streams and rivers to the great deposits near the sea. Alluvial soils thus necessarily consist of minute or impalpable particles of a great variety of minerals; for though the predominating earth may in some be clay, in others lime, and in some sand, yet, derived as they are from all the geological formations which the river and its tributaries have traversed, they cannot fail of containing in due proportion every ordinary ingredient.

The extent of an alluvial deposit is proportioned to the range of the river inland, the bulk of waters, and their *spread* where in contact with the sea. When very extensive, so as to check the flow of the waters which have formed it, and cause their exit through many mouths, it is generally of a triangular form, widening towards the coast; it is then called the delta, but it exists in this form only at the mouths of large continental rivers. In our own country the formation is confined to marginal deposits along the banks of the rivers, or the sea. It occurs to the greatest extent on the east coast of the island; in the shores of the Wash, and at the mouth of the Humber, it forms districts of large extent. On both sides of the Thames, and of the Bristol channel also, there are considerable deposits. From Bridgewater inland, in Somersetshire, there is an extensive tract of alluvial land. In Scotland, on the banks of the Forth and of the Tay, there are considerable deposits, which receive the name of *carses*; and along the banks of other rivers in England, Scotland, and Ireland, the same formation occurs. These districts are, as we might expect from the constitution of their soil, among the most fertile in the country. Their agricultural value is greatest when the tidal and river floods mingle before the deposit takes place: the district is always the most extensive also under these conditions; and both circumstances are admirably illustrated in the following passage taken from an article on the Rural Industry of Holland, in the *Edinburgh Review* of October, 1847:—

“In the waters of the rivers, but especially in those of the sea, there exist vast numbers of minute microscopical animalcules, called by Ehrenberg infusorial animals, which are fitted to live, each class in its own special element only, and which therefore die in myriads when the sweet and salt waters mingle. It is almost

incredible to see how densely the water is sometimes peopled by these creatures, how rapidly they multiply, in what countless numbers they die. Their skeletons and envelopes, consisting of silicious and calcareous matters extracted from the matter, are almost imperishable. They commix with the mud of the river and come with it to form the deposits of slime that fill up the fertile land, which increases seaward where the waters are still. As the tide advances up its channel, the waters of the river spread and flow over the surface, so that far up the stream, where the upper waters are still sweet, the salt or blackish under current carries the living things which float in it to certain death, and leaves their bodies behind it to add to the accumulating mud. The extensive mutual surface of river and sea waters, which in this way are made to meet, involves a more rapid destruction of infusorial life than could in almost any other way be brought about. Experiment has shown that, as far up as the tide reaches, the so-called alluvial deposit, in and along the channel of the river, abounds with the remains of these marine animalcules; while above the reach of the tide none of them are to be found. In the Elbe they are seen as far as eighty miles above its mouth; about Cuxhaven and Gluckstadt, which are nearly forty miles from the open sea, these siliceous and calcareous skeletons form from one-fourth to one-third of the mass of the fresh mud, exclusive of the sand, while farther up the river they amount to about half of this quantity. In the Rhine, the Scheldt, the Mersey, the Liffey, the Thames, the Forth, the Humber, and the Wash, the same form of deposit goes on. So that in the mouths of the stated rivers there are to be superadded to the mechanical debris brought by the upper waters the more rich and fertilising animal spoils which the sea thus wonderfully incorporates with the growing deltas, and the banks of rising mud. And thus it is seen, that our islands generate upon the sea, not merely in proportion to the quantity of solid matter held in suspension by the descending waters, but in proportion also to the richness of the sea in microscopic forms of life, and to the volume of fresh water which the river can bring to mingle with it. Such is the origin of the alluvial soils of this country—properly so called—and of the sea bordering clays formed of mixed mineral and animal matters, the almost fabulous fertility of which tempts men every to brave disease and rapid death, and to expend unwearied toil in snatching them from their watery dominions, and defending them by hugh dykes.”

Frequent analysis of alluvial soils has sufficiently proved the extremely compound nature which the mode of their formation necessarily confers upon them. The various minerals, too, present in them, are accompanied in very con-

siderable proportion by the organic matter of animal, as well as vegetable origin, which the statements in the above quotations would lead us to expect. To this they owe much of their fertility.

As to the produce of these lands, about one half their extent in this country may be arable; the remainder being meadow and pasture land. They yield larger crops of grain, grass, and green crops, than any other soil in the kingdom. They may average in rental from £3 up to £5 per acre, and often let for sums still larger. The crops on them may, in ordinary seasons, vary from 30 to 50 bushels of wheat; from 40 to 70 bushels of beans; and from 70 to 80, upwards of oats. The grass crop, on the pastures may produce, on an average, upwards of 30 cwt. of hay. We know of districts on this soil, which, in the course of a summer, will graze a 100 stone ox, turning him out well fattened, besides three or four sheep per acre in addition.—*Cyclopedia of Agriculture.*

**ECONOMY OF FODDER.**

Every farmer should be careful of his fodder, and economise its use; during the winter, especially, very much is usually wasted; in straw more particularly is the extravagance observable. It will hereafter be wanted either as bedding for cattle, or, if other provender runs short, for cutting into chaff to mix with hay and other materials, in forming compounds in spring. Farm horses may be fed with straw cut fine and immersed in boiling linseed meal and water till all is absorbed, when it should be well mixed up. The straw thus becomes a good medium for conveying the linseed meal, the most fattening of all substances, into the stomach of the animal, and the effect produced is of the greatest advantage. The importance of a judicious mode of feeding is forcing itself upon the attention of farmers.

**AUCTION SALE OF FRUIT TREES, &c.**

THE undersigned is authorised by the Proprietor of ROSEBANK NURSERY to state, that, as early after the opening of the navigation in spring as possible, there will be a Sale by Auction, in this City, (similar to that which took place this fall) of Apple Trees, a fine assortment of suitable named sorts.

Pear,	do	do	do
Plum,	do	do	do
Cherry,	do	do	do

TOGETHER WITH

Raspberry Bushes, Strawberry Plants of fine named sorts, Roses, and various Ornamental Trees and Shrubs.

The healthy condition of these Trees and Plants, and the accuracy of their names, may be depended upon, and the sale will take place in good time for subsequent spring planting, which is the safest, at any rate, in all northern climates.

JOHN DOUGALL,  
Montreal Witness Office,  
Agent for Rosebank Nursery.

**CANADIAN GLASS MANUFACTORY,**  
NEAR SNYDER'S LANDING, VAUDREUIL,  
*Erected and carried on by Messrs. Boden  
& Le Bert.*

**THE** Proprietors of this establishment are prepared to Manufacture **LOOKING GLASS PLATE** and **WINDOW GLASS**, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

**SODA, GINGER, and ROOT BEER BOTTLES,** with or without the maker's name.

—AND,—

**MILK CANS,** of suitable sizes.

All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 205 and 207, Notre Dame Street, Montreal.

Vaudreuil, January, 1850.

**FARMING IMPLEMENTS.**

**WE**, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

**M. J. HAYS,** Cote St. Antoine,  
President M. C. Agricultural Society.  
**P. P. LACHAPPELLE,** Sault au Recollet.  
**W. M. EVANS,** Sec. L. C. Ag. Society.  
**JAMES SOMERVILLE,** Lachine.  
**EDWARD QUINN,** Long Point.  
**T. E. CAMPBELL,** Major, Civil Secretary.  
**HUGH BRODIE,** Cote St. Pierre.  
**P. F. MASSON,** Vaudreuil.  
**P. E. LECLERE,** St. Hyacinthe.  
**JAMES DAVIDSON,** Quebec.

**REAPING MACHINES.**

**THE** Subscriber has on hand three **REAPING MACHINES** of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

**MATHEW MOODY,** *Manufacturer.*

**NEW SEED STORE.**

**THE** Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

**OPENED HIS SEED STORE,**

*At No. 25, Notre Dame Street, Opposite the City Hall,* Where he will keep an extensive assortment of **AGRICULTURAL and GARDEN SEEDS and PLANTS** of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

**GEORGE SHEPHERD.**

Montreal, April, 1849.

**NOTICE**—Some excellent Barley and Oats for sale, for seed, the produce of seed imported expressly last Spring from Britain—Samples to be seen at Mr. Shepherd's Seed Store.

Montreal, January, 1850.

*Agents for the Agricultural Journal.*

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**Capt. Stewart,**.....Clarenceville.  
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All communications connected with this Journal to be addressed, post paid, to the Secretary of the Society—**WILLIAM EVANS,** Montreal.

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