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AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2. MONTREAL, APRIL, 1843. NO. 4.

The period is fast approaching when farmers will be able to resume their work in the fields, and we trust they will make a great effort to have the land in a proper state to receive the seed and to produce a full crop. The experience of last spring should be a warning to all —how essential it is to have arable soil under crop sufficiently drained. No field should be allowed after sowing, to remain for one day without being water-furrowed and drained. A very heavy shower of rain, falling immediately after the seed has been harrowed in, may prevent any chance of a good crop, if the water-furrows and drains are not in good order. Last spring, the loss sustained by farmers, in consequence of the heavy rain in June, must have been immense, and this must be attributed chiefly to the want of perfect drainage. As the snow is now fast disappearing, farmers should carefully examine all their drainage, and put them into perfect order, so that all superfluous water may run off the soil. When there are heavy falls of snow, the drains are very likely to become obstructed or filled up. The work of spring sowing cannot be executed in perfection, or with any prospect of a good crop resulting, upon soil not sufficiently dry. We are convinced that crops are more deficient from defective drainage, and from land being worked in spring in a wet state, than from any other defect in our system of Agriculture. Arable land has been more improved lately in the British Isles, by draining, than by any other means. The level clay lands that prevail so generally in Eastern Canada, require most careful drainage to secure the crops from the injurious effects of heavy falls of rain, during every stage of their growth from the period of sowing. A farmer may soon satisfy himself by making an experiment upon a small scale, that a good crop cannot be produced on strong clay land, if the soil has been saturated with water before or immediately after sowing. The land becomes hard, and if the plants do happen to survive, they are thin and stunted, and produce a very poor crop—grass and weeds take the place of the useful plants. This will be the certain result of an experiment made upon a small scale. The first sowing in the spring where the soil is in a fit state to work, is oats, which cannot be sown too early. We have no doubt that a crop of oats, early sown, on soil in good condition, will yield a produce of double the value of that late sown. The chief cause of the poor quality of our oats is from very late sowing and careless cultivation. The next crop to be put in early is peas, and these should be as soon as all danger of the plants being injured by the frosts would be over. It will not be necessary to sow barley before the first of May—a very good crop may be raised from sowing early in May. Potatoes should be put in as early as the season will admit. It has been proved that the early planted succeed best, and are less liable to disease. Dry gravelly soil is the most suitable, and special manures, salt, lime, ashes, soot, will be found more likely to produce a sound crop than farm-yard dung. Farmers should be content to grow moderate crops as regards quantity, because those

that are forced by manure are not in any case so good for the table, and are much more subject to the disease. There are some varieties of the potato less liable to the rot than others, and those who plant should endeavour to obtain such varieties as they can ascertain to have succeeded best. The variety known as the cup potato are one of these, and are excellent for the table. By careful management, the potato can still be raised in moderate quantity, and we should be satisfied with that. Carrots and parsnips should be sown as early as the soil will be in a proper state to receive the seed. In a former number, we gave the mode recommended in Ireland for growing these useful roots, and we consider the same mode of cultivation may be adopted here. Mangel-wurtzel should be early sown; indeed all crops should be put in as early as possible, with the exception of wheat and Indian corn—the first should not be sown before the 20th May, and the latter not previous to the 15th of the same month. We need not observe that these works should be executed in the best manner, if good crops be expected. Top-dressing of meadows should not be neglected the moment the snow is gone. It is the opinion of many that the spring is the best time for the work. We would be disposed to prefer doing it in the fall; but, at any period, top-dressing grass land will have a good effect, and there is no way of applying manure that will pay better, where manure can be spared from cultivated crops. The farm-yard dung will be more usefully applied in this way, and to summer fallows, than to the potato crop; and should the grass land be subsequently ploughed up for grain, we believe the manure will have a better effect, put on previously, than directly applying it to the grain crop on the surface.

With pleasure we give insertion to the communication of Syllabus, and shall be glad to hear from him again. We have been most anxious for communications on Agricultural subjects, and have constantly solicited them. We were unwilling to give a large portion of original matter, unless from correspondents. If in any part of British America, able correspondents on Agricultural subjects could be expected, we should think it would be in Montreal; but the contrary has been the fact, from some cause we do not comprehend. We trust we shall no longer have this complaint to make. We have not hitherto adverted much to the breeding of cattle, because we imagined our first attention should be directed to the better cultivation of the soil, and preparing it so as to be suitable for keeping superior stock. The improvement of our land, crops, pasturage, and cattle, may proceed together, but the improvement of cattle and sheep cannot be well accomplished, generally, unless our crops and pasturage are also improved.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—Being a subscriber to and reader of the Agricultural Journal, I have been somewhat surprised to find so little original matter contained in its pages. Compilations and extracts from popular works of the same kind, are certainly all very well and very proper, showing the opinions and practical experience of those whose knowledge may be of the greatest value to depend upon, in guiding and directing the operations of inexperienced farmers, or even those who may wish to study Agriculture, either as amateurs or with the view of becoming professional farmers at some future day; for every farmer who wishes to become acquainted with the whole *modus operandi* of Agriculture will be thankful for information upon any subjects, when deduced from knowledge and experience.

But what I wish to observe is that I am astonished that few or none of our practical farmers, in this quarter of the Province, have yet come forward to give the Journal the benefit of their support, by contributing practical information to its pages. It is only by information gained from experience that a perfect knowledge can be obtained upon any subject, and those who have had the most favourable opportunities of acquiring their knowledge, ought to come forward, from time to time, with something which might be both new and interesting to many who have

devoted their lives and fortunes to Agricultural pursuits, without having had much opportunity of gaining knowledge from their own practical results.

Moreover, I see you have invited those who may be disposed to furnish you with such subject matter as they may think the Journal is in need of, to bring it to that degree of usefulness which it seems to have been the aim and object of those who first brought it before the public to arrive at. But your invitation appears not to have been responded to as yet, in such a manner as might have been expected.

One thing in particular has very frequently attracted my notice in reading Agricultural periodicals in this country, that is a great want of general and practical information respecting the breeding and rearing of domestic animals. Whether this subject has been neglected from a want of knowledge, or whether it has been thought of too little importance to require much attention, I do not pretend to know. But I believe that every practical farmer should possess, in some degree, a knowledge of this very important branch of his profession, so far at least as to enable him to select varieties of stock suitable for his soil, climate, and keep, and how to combine properties so as to supply deficient points, and form new qualities, more susceptible of improving either carcase or constitution, by which he may be enabled to bring his stock to perfection at an early age, so that he may obtain the greatest remuneration for the time, labour, and food consumed. All these are certainly considerations of great consequence to every farmer.

The large amount of capital invested in domestic animals by Agriculturists, as is shown by the late Statistical Returns made in England, fully demonstrates that the practical farmer cannot be too well informed upon such an important matter. It is as necessary to understand distinctly the rules of breeding, rearing, feeding, and managing the various classes of farm stock, whether in health or disease, as it is to understand the management of either plants, seeds, soils, or manures, and the influence of climates, seasons, and weather; for it is well known that by sufficient knowledge and judicious management, in breeding and rearing stock suitable for the market, a better return will be often obtained by the farmer in many situations, than if he had spent his time and money in growing either cereal or root crops; and if such be the case, I think every Agricultural Journal, Magazine, or whatever else may be the name of such publication as professes to assume the duty of disseminating practical and useful knowledge to an Agricultural community, should contain as much information upon the history, habits, qualities, properties, and varieties of those animals, as possible.

From having had opportunities at one time, of becoming a little acquainted with the routine of the above subject, and by careful observation, thinking and conversing with many distinguished practical stock farmers in Britain and other places, and from my frequent practice of committing the most useful remarks and observations to paper, I am still able to refer to many of those useful rules, which have been long forgotten, but yet, still capable of being prepared with little trouble to fill a corner in the columns of some Agricultural Journal, and whenever I shall have the opportunity of doing so, the trouble will be soon surmounted, from an ardent wish I have long entertained of promoting and serving the interests of Agriculture, by any little contribution I might ever be capable of rendering for the benefit of such a cause.

Then, Mr. Editor, if such communications should be considered suitable subject matter for the Agricultural Journal, published monthly in Montreal, I shall most willingly present them for your consideration, and will try to find leisure to furnish occasionally some useful remarks and reminiscential information, from the pages of my old Note Book, where many of them have remained in black and white for more than twenty years, without the least expectation of ever again being committed to paper a second time,

And I shall remain, Sir,

Your most obedient, &c.,

SYLLABUS.

[*For the Agricultural Journal.*]

HEDGES, BY A FARMER.

When we consider the wasteful expenditure of fuel, and the destruction of our forests, may we not fear that ere long, the Citizens of Montreal will be obliged to pay a most extravagent price for wood, that fencing will be a tax twice

as onerous as it is now, although it is already bad enough. Although my present object is to draw the attention of your readers to the necessity of planting hedges, I think it will not be improper to remark that the Imperial Government ought to show a good example to the citizens of Quebec and Montreal, by substituting coal for wood, as fuel. With these observations I beg to introduce to you readers an extract from a speech of Mr. McNab, of the Botanical Society of Edinburgh, who made a tour in Canada some three years ago:

"He was agreeably surprised to see such a variety of native haw-thorns, being convinced of their fitness for forming hedges, so very much wanted in this country, and which many of the inhabitants expressed a great desire to have, instead of the unsightly snake fences which at present separate the fields. But apparently they never thought that the indigenous thorns would answer for this purpose, as they talked of importing haws and white-thorns from Britian. Mr. M'Nab gave instructions to those individuals with whom he had an opportunity of conversing upon the subject, so that they may raise thorns for themselves, as an abundant supply of seeds may be annually procured at no great distance from each settlement. As these instructions may be interesting to others, we here repeat them:—'The fruit should be gathered about the end of October, care being taken to keep the seeds of the luxuriant growing sorts separate from those of the dwarfer kinds. A pit should be prepared about 1½ feet deep, into which the fruit is to be put with a mixture of earth or sand. It should be turned several times during the season, and if dry, a little water may be added; 1 or 2 ins. of soil being a sufficient covering to insure the decomposition of the pulp. During the following October a piece of good ground should be prepared, and the seed sown as it is taken from the pit, pretty thick in drills about 1 ft. distant from each other, or in beds 3 ft. wide. In the succeeding spring the plants will begin to appear; at which time, and throughout the season, they must be kept clear of weeds. If properly attended to the seedlings will attain a height of from 7 ins. to 12 ins. the first year. The following spring the strongest plants may be either transplanted into drills, or placed where they are intended to remain as a permanent fence. The smaller ones should be left in the seed-drills or in beds for another year, when they may be treated in the same manner. In forming a live fence, the ground ought to be prepared as soon as the snow disappears, by making a trench about 2 ft. broad, and a spade in depth. Along the centre of this trench the young plants should be put about 6 or 8 inches apart, and afterwards well watered and firmly trodden in. Care should be taken to protect the young plants from cattle, and to keep them clear of weeds. The second year after planting, the thorns should be headed down to within 6 or 10 inches of the ground, and each year afterwards switched up on both sides to a certain ridge, so as to produce the shape generally termed sow-backed; hedges trained in this form, being less liable to be destroyed by snow resting upon them than when cut flat at the top.' If the method here recommended be properly attended to, Mr. M'Nab has not the least hesitation in saying that an excellent hedge of native thorns may be acquired five or six years after planting. At several places he saw the indigenous thorns employed as a fence; at least, they had been planted with that intention, and had attained a considerable height, but from want of proper attention to pruning and weeding, they were so slender that easy access might be obtained between each stem. From such instances of mismanagement, an erroneous opinion seems generally to prevail that hedges will not succeed in America. 'But,' he very properly remarked, 'if newly-planted hedges in Britian were equally neglected, there can be no doubt that they would soon degenerate, and become no better than those which I observed in the United States and Canada."

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—Should any of your readers be able to give me satisfactory answers to the following questions, (*and I rather think there are some,*) he or they would render a great service to the country, and perhaps afford me an opportunity of addressing you on several subjects therewith connected:—

1. What *is* the average yield in the District of Montreal, or throughout Lower Canada, of wheat, oats, pease, Indian corn, horse-beans, buck-wheat, barley and rye?

2. What *ought* to be—were an improved system of cultivation adopted—the average yield of these crops?

3. What quantity of land is there in tillage in the District of Montreal, or in Lower Canada?

4. What is the value of wheat, &c.—*the produce of Lower Canada*—which is exported?

Answers to these questions ought to be made without the least exaggeration.

AGRICOLA.

FLAX—BY AGRICOLA.

I propose making a few remarks on flax. The subject has often been brought before the Canadian public without effect, and did I not think that the efforts to rouse the public mind to the importance of the due encouragement of this crop, will at last succeed, *I* certainly should let the matter drop.

I would ask my fellow-countrymen if this crop could not be made the *most important* for the Canadian *habitant* and his family? A crop, the produce of which would give his industrious family work throughout the year.

Let us look at what Ireland, or rather Belfast, has done to encourage us. Owing to the imperfect cultivation of flax in Ireland, the crops did not pay the farmer, and, in fact, we know that linens manufactured in Leeds and other English towns, were brought regularly into the Belfast markets and sold there.

"The opulence of Belgium and the North of Ireland, as well as of a large portion of the central and eastern counties of England, and some of the south of Scotland, and north of France and Italy, are largely dependent on this plant, which is one of the great staples of the world," remarked the Editor of the Montreal Gazette, in his journal of the 2nd October, 1847. I think that all will agree in the correctness of the following observations by the same gentleman. Who will second this? Much is expected from the Canadian Agricultural Society. Has it sufficient aid to do what its promoters would wish to do?

"We think it especially the business of an Agricultural Society to encourage its cultivation, give premiums for the description of the process, or rather import such, for they can be had, easily, on application to the Irish Society for the encouragement of the growth of flax, with a model machine for "scutching," which the Canadians seem to us most deficient in, using exactly the same process for separating the fibre from the woody part as their Celtic forefathers did in the time of the Druids."

[*For the Agricultural Journal.*]

The poet has said:

"'Tis folly in the extreme to till
Extensive fields, and till them ill;
Far more one fertile acre yields
Than the large breadth of barren fields.
Adverse, this empty pride expel,
Till little, and that little well."

There is a great secret in that last line.

I, with my little farm of four acres, delight to repeat that my joy is to have

"A little farm well tilled,
A little barn well filled."

Reader, listen to the following account which I have from a farmer (perhaps a man who has only thirty acres is not a farmer, but merely the owner of a patch of land) who manages thirty acres of land. My friend, Atkins, does not inform me, but I am pretty sure he does not cultivate *weeds*. He is such a wicked fellow, gentle reader, that I am sure he would destroy the first weed which durst show its face. He won't allow a weed to come into competition with his crops. I won't say any more, but shall let friend Atkins speak:—

"I raised, the past year, from 30 acres of land, 700 bushels of potatoes, 80 bushels of barley, 25 bushels of beets, 15 bushels of wheat, 10 bushels of beans, 4 tons of mowed oats, 6 tons of English hay, 10 tons of meadow hay, 40 bushels of corn, 20 bushels of carrots, 75 chickens and turkeys, and a great variety of garden sauce.

"I have killed one hog, weighing 300 lbs., made 400 lbs. of butter, kept three cows, a pair of oxen, two heifers, two steers, eight sheep, four hogs. I have been on the place but two years, and have laid six acres of land to grass; the land a clay loam, easy to work. I mix lime with my compost, and plaster my corn, potatoes and grass. I sort my potatoes before sale. Finally, I cook everything I give my hogs, and feed warm and keep warm

"A. T. Atkins."

He who can beat this, will oblige me by giving me particulars how he did it, and as I shall not be the only party who will be obliged, let the whole statement be published in the Agricultural Journal.

An Admirer of A. T. Atkins.

We are much obliged to our correspondents, "Agricola," and "An Admirer of A. T. Atkins," and hope they will favour us again. If Agricola's queries are not answered, we shall endeavour to reply to them. The best proof any farmer can give of the interest he feels in the general improvement of Agriculture, is by communicating any information or suggestions that he considers calculated to produce general good to his country.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—I have much gratification in acknowledging the receipt of the three first numbers of this excellent periodical. I have read them with pleasure, and I trust with some profit also. At any rate, I shall not fail to endeavor, as far as I am able, to avail myself of the suggestions and information they contain.

I know of nothing more wanted in this country than sound information on subjects connected with Agriculture, and we who obtain our living by the noblest of all employments, are certainly greatly indebted to you for the deep and long-continued interest you have taken in our welfare, and consequently in the prosperity of the country. I have means of knowing the sacrifices you have made to advance the agricultural interests of the country. I know also that these sacrifices have not deterred you from still pursuing the same course undeviatingly; and if your exertions have been less successful than you could have wished, still it must be a source of gratification to you that there are among us many who appreciate your exertions, and some of us who attribute their present prosperity to the suggestions which, on entering upon their new profession, they obtained from you.

In such circumstances, it is natural that I should have been gratified to learn that the Provincial Society had determined upon publishing a Journal in the French and English languages; feeling as I do that the free circulation of agricultural periodicals may be of most essential benefit to the country in general, and to the farmers in particular. Aided by the establishment of local Agricultural Societies, and of Model Farms, I have no doubt that a new appearance will be given to the whole of the lands in Canada. In our neighbourhood, we have lately succeeded in forming a Society, in which nearly all the farmers have enrolled themselves as members; and the good effects of the discussion it has opened, and the emulation it has created, are already sensibly felt, and an impetus has been given to agricultural improvement greater than the most sanguine among us had at all ventured to anticipate. I am now making arrangements to try an experiment in corn planting in the manner suggested by a very excellent book called "The Rural Economist," and I have a machine in course of construction for the purpose of facilitating the work. The results I shall, if you will permit me, have the pleasure of communicating to your readers; and, should the machine work as well as I anticipate, I shall endeavour so to describe it so as to make it generally available.

G. G.

Edwardsburgh, March 15, 1848.

PHOSPHATE OF LIME.—Professor Way, the Consulting Chemist to the Society, brought under the notice of the Council some discoveries lately made by Mr. Pain, of Farnham, in Surrey, which in Professor Way's opinion were likely to prove of great importance to practical agriculture. Mr. Pain had been induced to examine the subsoil of some parts of his estate, and had been fortunate enough to find large quantities of organic remains, consisting chiefly of phosphate of lime, the principal mineral ingredient, as it was well known, of bones. These remains were found in the land in two distinct gelogicial formations; namely, in the upper and lower green sand, but more particularly in the latter. Professor Way stated that these beds would, he had no doubt, be economically worked, and that an abundant source of phosphate of lime would be obtained at a moderate price for all those agricultural purposes for which the mineral constituents of bones had, by experience, been found to prove so beneficial.

At the November monthly meeting of the London Farmers' Club, a very interesting discussion took place on the question:—"What evidence is there that dung is deteriorated by being dried; and, if it is deteriorated, or if that state is proved to be injurious, in what way is the injury effected?" Mr. T. C. Nesbit was requested to reply to this question, and he accordingly entered into a long explanation, the substance of which was, that dung should be preserved as much as possible from washing and drying until brought out to the field for use, and he recommends that it should then be ploughed into the soil, (if in the fall or winter,) but not unless the soil is well drained. If spread upon grass land, he observes:—"The spreading of dung on grass lands, or on young clover, at this or an earlier season of the year, may be very beneficial, because the soluble matters washed down into the soil from the manure, act immediately upon the plants, and set them growing. There is no doubt at all, of the great benefit of this proceeding, as the plants are all the while availing themselves of the assistance of the manure." Mr. Nesbit then referred to the putting out of manure on arable land in the fall, to be ploughed in for future crops; and his observations are so applicable to our agriculture, that we think them well worthy of attention, and copy several extracts from his lecture:—

Now, if manure be left exposed to the action of the air, supposing you put it on at this season of the year, if the sun and the wind be strong enough to dry it, we should have a certain loss of ammonia, as indicated by the experiments which I have mentioned; but supposing rain were to fall in considerable quantities, not only the volatile but even the soluble substances would be washed into the soil, and we should see no loss by drying. The result depends entirely upon whether the rain comes sufficiently fast upon the dung which is thus exposed to the action of the air. If the rain fall very fast, the volatile and soluble substances will, as I have before stated, be sent into the soil, so that you will have only well dashed dung spread upon the surface, similar to that which many farmers do spread upon it. (Hear, hear.) Now, if these substances be thus washed into the soil, the question arises, What will be the effect when it is not drained? Two very different results will follow. If the soil be not drained, the probability is that we shall have the bottom water rising to within a few inches of the surface, so that a small quantity of rain would speedily fill the interstices of the soil to the surface, and then the rain, with all the soluble matter therein dissolved, would flow over the surface and be lost. I consider that in the case of undrained land there must be far greater loss of volatile and soluble substances than in that of drained land. If the soil be drained—say to the extent of four feet—the quantity of rain which will fall at one time will very seldom fill up the whole of the interstices of the soil, and evaporation will also come in to prevent the accumulation of water to any considerable extent. In drained lands rain will carry the soluble matters *into* the soil—not over the soil. Every one knows that soil which has been drained has a singular aptitude for absorbing soluble substances, from the water which percolates through it. Some very valuable experiments have been made on this subject by Mr. Warrington, of Apothecaries' Hall. He found a quantity of water containing Epsom salts or other soluble substances, when filtered through charcoal and other porons substances, lost a considerable portion of the soluble matter, from the charcoal and porous substances absorbing it. If the rains do not come in large quantities, it is probable that the evaporation from the surface will be sufficient to take off all the redundant water; but if they come to the depth of an inch and a half in one shower, there must be a slight loss of soluble matter, even on drained lands, by the escape of water through the drains; but the loss in the case of undrained land will be the greatest. The organic parts of the dung, such as the straw, &c., left on the surface, will undergo a very slow decomposition, liberating ammonia and carbonic acid. The ammonia and carbonic acid being liberated not in the soil, but merely on its surface, these bodies will escape into the air. There will, therefore, be a loss, I apprehend, from the dung being left on the soil, even supposing the first soluble and volatile matters to be washed into the soil by a shower of rain. Now, what is the action of manure if ploughed into the land? You will put into the land all the volatile, the soluble, and even the insoluble substances, and cover them over with earth. We may then apprehend that the volatile and soluble substances will not pass out of the soil; that all which is liberated by the further decomposition of the manure will be retained, and not lost Through the carbonic acid which is given out, you will have a constant action upon the inorganic matters of the soil, a decomposition of the silicates, and a liberation of the lime, magnesia of potash and soda connected with them; and the ammonia given out by the manure will likewise be absorbed by the porous soil around it. You will have, in fact, a sort of natural saltpetre bed. I do not know whether you, gentlemen, are

aware of the method of making saltpetre artificially, such as was employed by the French during the late war, when our cruisers prevented the French nation from obtaining it from the East Indies. The whole of the saltpetre consumed during the first French Revolution was manufactured in France. The mortar of old walls, the ground underneath cow-houses and stables, or wherever there had been animal excrements of any kind, was taken up and placed in layers with earthy matter. When they could not get old mortar, they used chalk and similar substances; these were kept at all times under cover, and were watered from time to time with urine, or, in lack of that, with water. These heaps or beds were turned over occasionally, and were kept rather light, as the quantity of earthy matter employed was sufficient to prevent the production of any great degree of heat in the fermenting mass. At the end of twelve or eighteen months the whole of the matter was put into large tanks, and washed with water; and the water was always found to contain a considerable quantity of nitrate of lime. This water, containing the nitrate of lime and other soluble substances, was boiled with wood-ashes, which you all know contains carbonate of potash. A double decomposition took place—carbonate of lime and nitrate of potash were produced: the carbonate of lime was precipitated, and the liquid containing the nitrate of potash or saltpetre was pumped off, and then evaporated; the nitre separated by repeated crystalizations from the common salt also contained in the solution. Now the same thing will take place in land, if you have the presence of calcareous matter. In this case you see the nitrogen of the decomposing vegetable matter converted into nitric acid by this slow process of nitrification, and the acid formed in the ground will unite with either lime or potash, or any other base that may be present in the soil. But none of this will take place without the presence in the land of calcareous matter, or of alkaline salts. This is one reason why the presence of lime in land is of such very great importance. It ought never to be absent. If the soil does not contain at least three per cent. of carbonate of lime, that proportion ought by all means to be furnished, because, for a thousand other reasons, the presence of lime is extremely beneficial. Now the nature of the soil as to its texture will greatly influence the action of the manure. There is also a great difference between the manure being put on long and its being put on short. If you plough very long dung into light land, the effect will not be good. According to practical men, dung which has been decomposed to some extent is best for light land: while longer dungs are preferable for soils of a stiffer and more impervious texture. Now, there is one point of view in which the subject still remains to be considered:—Will manure, when the volatile and soluble particles are washed out, and when it is in a state of decomposition on the surface of the soil, absorb anything from the air? will it in fact, absorb any ammonia? This is a point to which attention ought to be paid; because if this were so, it might be a compensating means of paying back what might be lost by previous evaporation. We know very well that charcoal, and many porous bodies, will absorb a large quantity of ammonia and of other gases. A cubic inch of charcoal will, I think, after being heated to a red heat and cooled, absorb ninety cubic inches of ammoniacal gas. Burnt clay, too, will absorb a very large quantity. If you take a piece of common pipe-clay, heat it red hot, and then expose it to the air for the space of a week, you will find it will have absorbed a large quantity of ammonia, which will again be given off by a red heat. Wood, which has been decomposed in the hollows of old trees, has, for some reason or other, absorbed ammonia from the air; and there can be no doubt that the vegetable matter of straw, and other substances, will absorb a certain quantity of ammonia. But the question is, whether it will absorb more in that position than it would it entered in the ground, or whether it will produce greater benefit. In the case of drained land, where the air is certain to permeate the soil, I believe that the action of manure will be better *in the land* than it would be on the *surface of the land*. In the case of soil which is undrained, however, a different effect may be produced; for as no air can possibly enter there to produce decomposition, and as decomposition cannot go on without the air, the probability is that manure would, in this point of view, act better on the surface than if it were entombed in a mixture of water and earth. But I reiterate that the maximum amount of effect is never obtained from dung on undrained lands. Now the question is, whether it be preferable to plough-in the dung which is taken to *drained* land in the winter, or to leave it exposed to the action of the air on the surface? We have seen that if it be exposed on the surface, the soluble matters will be washed in, though the volatile may escape, and the results of any decomposition which may take place after will probably be lost. We may also conclude that, even if this manure absorb ammonia from the air, the sun will come upon it and dry it, and it will consequently be lost. I am now speaking of drained, and not undrained, land; because if the land be drained, and you plough in manure, you will have both the volatile and soluble matters arrested. I think, therefore, on the whole, that in the case of drained land a greater benefit will arise from ploughing in dung than from leaving it on the surface. Of course a great deal of difference will exist on different kinds of land. I speak now of good dung and good drained land; and I think the balance of advantages is, under such circumstances, in favour of entombing manure in the land; at the same time, I must ask the practical gentlemen now present to favour us with their opinions on this

subject. I have been searching for the opinions of those who have written on the subject, and they seem rather to imagine that there is no great difference in point of advantage; some advocating one view, and some another. I will read to you the opinion of M. Boussingault, the great French chemist, as expressed in his "Rural Economy." His remarks are very judicious. He says:— "The method which I have recommended of leaving manure spread over the surface of the fields, exposed to the weather for several weeks or months, has been severely criticised. By such exposure, it has been said, the dung must lose its volatile elements, and the rain must wash out and carry off its more soluble parts." With respect to that point, I must observe, that I do not think the rain will at all carry off the soluble parts except in the case of undrained land, when it undoubtedly will do so if it be heavy. "Influenced by such fears, some farmers do not spread their dung until the moment of ploughing it in. Such diversity of opinion among practical men, all personally interested in deriving the greatest possible amount of advantage from the manure they employ, must not be thought of lightly; when different modes of procedure in agriculture are the subjects of debate, we must not be in too great a hurry to come to general conclusions. Climate is not without its influence in the question which now engages us. In Alsace, experience has pronounced in favour of the practice followed; but in other countries there may be very good reasons for not proceeding in the same way. In Alsace, where the annual depth of rain amounts to 36.7 inches, no more than 4.3 inches fall during the three months of December, January, and February." Rain falls to nearly double that extent in this neighbourhood. "In a district where a larger quantity of rain falls during the winter, the manure would probably suffer from the procedure followed in Alsace. The quality of the manure must also be taken into consideration A dunghill which contained a large proportion of carbonate of ammonia, which exhaled a strong smell of volatile alkali, would infallibly lose in value by any unnecessary or prolonged exposure to the air." Now, carbonate of ammonia will invariably be found in large quantities in good dung, unless prepared by means of gypsum, sulphate of iron, &c.; so that, you see, although in the case of ordinary dung there might not be any great difference, yet in the very best dung, in which no means had been taken to render the ammonia non-volatile, a great loss would be incurred. "But," he continues, "the loss becomes insignificant when the manure, by good management, is brought to contain but a small proportion of volatile ammoniacal salts, as happens with manures which have received additions of gypsum." M. Albert D. Thaër, in the excellent translation by Messrs. Shaw and Johnson, page 436, says: "There are visible advantages attending the spreading upon the land fresh strawy manure, and to leave it till the ploughings of spring commence; taking care, however, that the water does not wash away the juices and carry them beyond the field, but that it merely allows them to penetrate the earth. This method of covering the soil during winter renders it much more friable, and remarkably fertile. I have often seen the washed, but not rotten, straw thus left on the ground, removed to form fresh litter: and, nevertheless, the soil from which this straw has been collected appeared as perfectly manured as if all the straw had been decomposed." This, you know, was evidently caused by nothing else than the washing of the soluble matters into the soil. "Meadows," he says, "are often manured in this manner." That I have, of course, nothing to do with; I am speaking of fallows. Again he says: "From many experiments tried by myself, as well as other agriculturists, it appears nearly beyond doubt that dung, which has passed the highest state of fermentation, loses nothing of its quality, but improves, even during hot, dry weather." Now, you are aware that, if this manure has been fermented to so great an extent as to drive off the volatile matters, it can lose nothing at all by any heat to which it may afterwards be subjected; because it can never, by any heat of the sun, get heated so much as by its own fermentation. He says, further: "It appears, therefore, that there is no solid ground for objection to leaving the manure uncovered on the land for some time; but, if the field lies on a declivity, there will be the risk of the juices being washed off the land by the heavy rains." You know, gentlemen, that, as regards the spreading of manure, it is a matter of considerable importance that you should have your own opportunites for doing it. Sometimes your horses are so employed that you cannot use them, and you are obliged to leave the work till another time. It is impossible always to get men to plough-in manure as soon as it is spread; and I do not think the exposure of it to the air for a little while can be any material detriment to it; while the extra labour and expense of ploughing-in at an inconvenient time may overbalance what would be saved by doing so. On the whole, however. I am of opinion that the sooner dung is ploughed into the land the better. Another point for consideration is this: Dung put on the land ought on no account to be allowed to remain in small heaps. The rain, in falling on these heaps, will wash out the soluble matters, which will be absorbed by the soil in the immediate neighbourhood of the heaps. When the manure comes to be spread, the rest of the land will get only the well-washed straw, and the ensuing crop will infallibly show the inequality of the manuring received by the land. I thank you for the attention which you have paid to my remarks; and I hope that, on account of the shortness of the notice, you will excuse the very imperfect manner in which I have introduced to you this important subject (cheers.)

Upon the more extended question of leaving the dung exposed upon fallows, or ploughing it in, I think the evidence, chemical and practical, is in favour of ploughing in as soon after spreading as circumstances will permit. If we still wish to extend the subject, and take into consideration the spreading of dung upon grass-lands or clovers in July or August, I think there can be no doubt whatever that the advantage to be derived from such a plan would far outweigh any loss which might arise by drying. The top-dressing with farm-yard dung, or with guano or rape, &c., come under the same category; and all experience, I believe, has proved that this mode of manuring is very advantageous, being, in fact, the only available means of proceeding with pastures, clovers, or grasses. Mr. Shaw's queries involve points of considerable importance, viz.: Do the use of gypsum, or sulphate of iron, or dilute sulphuric acid, deteriorate the ammonia? The ammonia would not be deteriorated, but would merely pass from a volatile combination with carbonic acid to a non-volatile one with sulphuric acid. Another very important question was asked by Mr. Shaw, viz.: Will these and other salts of ammonia serve the purposes of the plant as well as the carbonate? that is, will the sulphate of ammonia itself do so? No doubt it will do so, under general circumstances, when properly made; but at the same time cases might arise, and doubtless do arise, in which it would not serve the purposes of the plant as well as the carbonate does. But you must recollect that in converting the volatile carbonate into the sulphate you save that which would otherwise be lost. Now we have reason to suppose that plants do take their ammonia, upon the whole, in the form of carbonate; and therefore, unless this sulphate of ammonia be re-converted into carbonate, it probably will not serve the purposes of the plant. But how is it to be re-converted into carbonate? This is one of the many difficult questions which are sometimes presented for our consideration, and it will bring us at once to the importance of lime. When lime is put on land, it speedily absorbs carbonic acid, and becomes carbonate of lime, or chalk. Marls, limestones, and many other substances contain carbonate of lime. If sulphate of ammonia and carbonate of lime be mixed together with excess of water, no change will take place. If, however, they be mixed together dry, and as much wet sand be added as to make them moist merely, not wet, a decomposition will immediately take place: the sulphuric acid will leave the ammonia and take the lime, forming gypsum; while the carbonic acid separated from the lime will unite with the ammonia, forming the volatile carbonate of ammonia, which is immediately detected by the smell. If a quantity of water be now added, the decomposition immediately ceases; but it will be renewed whenever the water has evaporated sufficiently to reduce the mixture again to a merely moist state. This same action takes place in our soils containing carbonate of lime and gypsum. Carbonate of ammonia falling with the rain water, is, by contact with the gypsum in the wet state, immediately changed into sulphate of ammonia. When fine weather comes, and the redundant water evaporates, no ammonia is lost with the evaporation of the water, as would inevitably be the case if the volatile carbonate had not been changed into the sulphate. When the water has left the land to such an extent that it is no longer *wet*, but moist and warm, the reverse change takes place—carbonate of ammonia is reproduced, and is immediately taken up by the roots of the plants and by the ever anxious leaves. If the water again makes the soil wet, this action ceases until the redundant water has evaporated. These dissimilar actions of the same salts under two different circumstances are wonderful instances of the minute care displayed by the Almighty in preventing the escape from the land of any substance which is beneficial to vegetation. If sulphate of ammonia be put on land containing calcareous matter, the action will be precisely similar, and will cause the ammonia to be presented to the plant in the form of carbonate. We have had no experiments proving (but experiments have rather tended to disprove) the notion that sulphate of ammonia, without this change, is useful to plants. There can be no doubt that it is a matter of very great importance to practical farmers, for many other reasons, that they should have a proper amount of lime in their soils. I have mentioned once or twice before, that I have known experiments with respect to artificial manures to be completely unsuccessful in soils from which lime was absent. I have afterwards known the very same manures used in the same neighbourhood on soils containing carbonate of lime, with the very best results. We are now engaged in our laboratories in investigations on a great variety of soils, in order to ascertain the amount of carbonate of lime contained in both soils and subsoils. I assure you that the proportion in many is exceedingly small. In 250 grains of a soil quite dry, an experiment only gave $\frac{1}{10}$ grain of carbonic acid. There was, in fact, in many not $\frac{1}{10}$ per cent. of carbonate of lime—a proportion, I need not add, much too small. Now I think the amount either of lime, marl, or chalk ought to be at least 2 or 3 per cent. There cannot be the least doubt that manures will act to a much greater extent, and much more beneficially where lime is present in the soil than where it is wanting. The results of the experiments now making I shall at some future period feel great pleasure in laying before the club; and I trust that day by day the union already existing between "practice and science" will be more closely cemented, and that the British farmers may derive such benefit from their united operation as ever to keep them in their proud position of the first agriculturists of the world (cheers).

We perfectly agree with Mr. Nesbit in what

he has stated respecting the application of manure. On undrained land, it is almost useless to apply manure in any way, either on the surface or ploughed in. Mr. Nesbit has clearly demonstrated this fact, and the practice of every farmer will prove it. Before any attempt, therefore, is made to improve land, it should be sufficiently drained, not merely of surface water, but in the manner described by Mr. Nesbit, so that rain that falls may be permeated through the soil, and not over the surface.

Slugs are much more destructive to the crops in Canada than is generally imagined. These vermin may not be so numerous here as in England, but we know they are in sufficient numbers to injure crops very materially. We have seen the report of an English farmer, of an experiment he made with wheat sown on a clover lea. On one part of the field, lime was put on previous to ploughing for the wheat, and on the other, the lime was applied when sowing the wheat upon the ploughed soil. On the former portion, the slug did not injure the crop, and on the latter, much injury was done by them to the young plants. This report states that if lime is applied early in the morning, while the dew is on, that the slugs being upon the surface among the clover, the lime will destroy them; but that if the land is ploughed previous to the application of lime, the furrow slice will protect the slugs at any subsequent application of it, and when the wheat plants appear they are in a safe state to prey upon them. If Canadian farmers were able to apply a dressing of lime to the soil, before they plough in the fall, we have no doubt it would act beneficially. It would assist at once to bring into useful action all grass, weeds, and roots, that might be upon or in the soil, for the nutriment of future crops. It is almost an absurdity to expect good crops to succeed the general mode of preparing the soil for them, unless we have the land new and extremely fertile. It is out of the question to expect good or profitable crops without a very general change in our system of agriculture. If farmers here were to be subjected to the payment of annual rents, as in the British Isles, the thing could not be done from the proceeds of the lands by the present system of husbandry. The augmented produce of land in the Mother Country, over what we obtain from it here, would enable a farmer in the former country to pay a considerable rent and other taxes. When land is well drained, the deeper the farm yard manure is put the better, because it ensures a sufficient depth of mellow soil for the roots of grain crops, or for deep-rooted green crops, which are said to penetrate the soil several feet deep, where it is sufficiently open for them to do so. When manure is incorporated deeply with the soil, grain crops in particular are stronger in the straw and more healthy than when recent manure is applied on or near the surface. Special manures must, of course, be applied with the seed, or a top-dressing on the surface. When farm-yard dung is properly and deeply mixed with well drained soil, every particle of the gaseous exhalations from the dung, will pass upward through the loosened earth, for the benefit of the growing crop, and subsequently a greatly increased depth of fertile soil is obtained for future crops.

The following observations from "Thaer's Agriculturist," on the subject of summer fallow, is well worthy the attention of Canadian farmers. The reasoning of Thaer is so clear and convincing to any man who knows anything about cultivating land, that it cannot fail to show the utility of summer fallow as a means of improvement for a large portion of the Canadian soil, that cannot be brought into a state of profitable productiveness by any other process. Strong clay land ploughed once in the year, the furrow slice remains unbroken, and year after year will remain so. Under such circumstances a good crop is not to be expected, but we shall let Thaer describe the matter in his own words:—

Fallow.—This term originally signified the state of a portion of land which, during the sum-

mer, or, what was better still, during the whole year, was turned up and carefully broken and divided by means of the plough or spade, in order to prepare it as perfectly as possible for the reception of the ensuing crops. Most of the Roman writers on Agriculture recommended this operation, and prescribed it as being necessary under certain circumstances, and many of them have given particular names to each of the processes which it includes, which are six ploughings, just as we have our particular terms by which to distinguish each of these operations.

But some persons have attached a widely different signification to the term "*fallow.*" As the fields wer either from negligence, from want of pasturage, or from a defective system of practice, and in total opposition to the aim and object of fallows, frequently allowed to remain unploughed until the month of June, and sometimes even until the month of August, and, nevertheless, were called fallow-fields; this word came by degrees to be used in a corrupt sense, and to be applied to land in a state of repose, and this introduced a misunderstanding and a misconception into the discussion. It is therefore necessary to give to this word the meaning which properly belongs to it. Thus to put in fallow is to prepare land for the ensuing crop by repeated ploughings during the summer, without seeking to obtain any produce whatever from it during that year. A field, therefore, cannot be said to be *fallow* until it has been ploughed once, and until, in short, it has been fallowed, for up to that time it can only be termed a field in a *state of repose.* When cattle are fed on it, the pasturage thus obtained is designated a pasture on a field in a state of repose. The utility of ploughing fallow ground cannot possibly be overlooked or denied, and the more tenacious or argillaceous the soil may be, the greater is the advantage which will be derived from it.

A simple ploughing in spring or autumn certainly will turn up and break the surface of the land, but it will not divide it sufficiently to break the clods and reduce them to loose earth. The soil when clodded together soon becomes hardened into compact masses, when it is covered without being broken; it even preserves the impression made upon it by the plough, and when the ploughing has been performed upon it when the ground was wet, the divided portions exposed to the heat of the sun become as hard as a tile. Land, when suffered to acquire this state, is highly unproductive, because the greater part of the plants having fibrous roots, are unable to penetrate these clods, and, consequently, are forced to turn round them, and the power of vegetation contained in the portion of ground which they occupy is, therefore, wholly lost The soil might as well be composed for the most part, of stones, as of mould thus conglomerated. There is scarcely any means by which these clods can be effectually broken, except by continued fallowing during the whole of the year, the effect of which is to bring them all to the surface successively, where they may be exposed to the action of the atmosphere, and having imbibed moisture and become softened, they may be broken by the harrow and other implements. If this process can be continued from the end of summer to the seed time of the following autumn or the spring succeeding, and care be taken that each operation be performed when the soil possesses the proper degree of humidity, the field will become transformed into a homogeneous, light, loose powder, and all the nutritive and fertilizing particles which it may contain will be brought into action; thus, we frequently see fields which were, to all appearance, exhausted, become exceedingly fertile, after having been carefully fallowed, even though they have not received any additional supply of manure.

The second benefit which fallowing confers upon the land is the destruction of noxious weeds which have multiplied in it, either from their seeds or by the roots. These weeds being frequently torn up by the harrows, crushed by the rollers, exposed to the action of the air, and to the influence of the sun, ultimately perish and enrich the soil by rotting upon it. As for the seeds of these weeds, they are brought on the surface of the soil by the action of the plough, detatched from the clods, which frequently contain innumerable quantities of them, and placed in a position which facilitates their germination; and at the commencement of their vegetation, the plants which have sprung from them are torn up and destroyed by the action of the plough and harrow, and contribute by their decomposition to the fertility of the soil. The fallowed ground is thus freed from these quantities of weeds which multiply almost to infinity amongst the corn, that is to say, if the land has been broken up at an early period, and if sufficient care has been bestowed upon the ploughing and tillage; for the clearing of the soil from weeds depends entirely upon the nicety with which these operations are performed.

In the third place, experience has taught us, and recent discoveries in Chemistry and Natural Philosophy have tended to prove the fact, that even the richest land ought to be occasionally exposed to the influence of the air, if we would have it become and remain fertile; and that it derives certain particles of matter from the atmosphere which must be combined with it in order to be transmuted into nourishment for plants. When the surface of the soil is hardened, it is as incapable of absorbing these particles of matter as the clods themselves. It is only when the soil is loose and divided that the atmospheric air can penetrate and come in contact with all its component parts, and produce its fertilizing influence upon them. This absorption of gaseous matters takes place only at a very high degree of temperature, and appears to be most effective during

the warm weather of spring. The operation of fallowing is the mode best calculated to ensure to a soil all those advantages which are derived from being frequently turned up, and from its surface being often changed and exposed to the action of the atmosphere and of light.

Lastly, it is by fallowing that the most complete mixture and incorporation of the various constituent parts of the soil, and of the manure which has been added, can be obtained. In order that the latter may produce the full effect, it ought to be brought in contact with, and to be able to fertilize every particle of the soil; indeed all husbandmen are aware that the effect of manure which is placed in the ground in lumps is very trifling. There is no method by which the proper degree of admixture can be so completely effected as by fallowing, particularly when the land is also ploughed up several times after the dung has been placed upon it.

To all these recommendations, it may be added, that fallowing allows the ploughing to be executed with a smaller number of cattle, because the preparation of the soil, and carrying the manure for the fallows, can be performed at a time when there is a respite from all other ploughing operations. In large Agricultural establishments which do not possess an extra number of teams, it is frequently a difficult matter to get the land ready for all the sowings, unless it has been prepared by fallowing, and the sowings are not unfrequently retarded to the manifest detrement of the crops.

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Where attempts have been made to dispense with fallows, on the well manured lands in the neighbourhood of towns, the ground has become filled with weeds, and notwithstanding the favourable appearance of the corn during the spring, it yielded a very scanty crop of grain; so great, indeed, were the inconveniencies resulting from this system of cultivation, that one fallowing was insufficient for correcting the defects which the the soil had contracted, and it was often found necessary to lay it down to grass for some years, or to expend a great quantity of manure upon it, and then devote it to the raising of crops of various kinds of fodder for cattle; until after receiving certain preparatory tillage, it can be again sown with grain.

The only thing which can enable us to dispense with fallows, and with those periods of repose which we lately mentioned, is an exceedingly careful tillage; such for example as that which the Belgians bestow upon their land, by arranging and dividing the surface of it in narrow beds or strips, after having in the first place pulverized it by the action of the plough, the harrow, the roller, and other Agricultural instruments; by sowing the tops of the ridges only, and leaving the sides exposed to the influence of the atmosphere, and by the cultivation of various kinds of plants, and by weeding and hoeing them by the hand, which, although not a general practice in triennial rotations, is very frequently introduced, and often with very material benefit. * * *

Note.—The description here given by the author of the process of fallowing land when properly executed, shows that he fully comprehended the meaning of the word in the proper sense, and he very justly reprobates its imperfect performance as being the main cause of having brought discredit on the process. The concluding observations on the mixing and incorporation of the constituent parts of the soil and manure as forming one great advantage derived from fallowing, is highly scientific, practical, and most valuable, and of which the benefits are yet forthcoming; for the very best and most improved practice of our day has not yet reached that point, though clearly demonstrated by observation and experience, and also by natural and chemical science. Clods of soil and lumps of manure, as the author very judiciously remarks, exert very little influence on each other; the reciprocal action of affinity is not produced from want of communication and commixture, so as to expose to mutual influence the greatest possible surface of particles. Delta grounds and alluvial soils, and experience in every cursory trial, fully confirm the truth and value of the theory.

Could any more convincing argument be advanced than the foregoing in favour of the necessity of breaking up the soil perfectly by the process of summer fallow? It may not be necessary on every description of soil, though we believe it will occasionally serve any soil except that which is very sandy. It is in the power of almost every farmer to adopt this mode of improving his land gradually, and he cannot adopt any more effectual method. The frost has a most beneficial influence here upon ploughed soil, as when the soil thaws it becomes very much broken and pulverized, but if it is not well drained to admit of the moisture leaving it immediately, the soil becomes a soft paste, and when dried by the sun, is as hard as a tile, and utterly unfit to produce a good crop. Though the land should be well fallowed it may be subject to the same injury, unless it is perfectly well ridged up, water furrowed and drained, and this is necessary in all ploughed land.

To Preserve Water in Sea Casks and Cisterns.—Water may be preserved quite pure, either in long voyages, or in cisterns, by the addition of about 3lbs. of black oxide of manganese powdered; stir it well together, and the water will loose any bad taste it may have acquired, and will keep for an indefinite length of time.—*Christian Almanack*, 1848.

DISTRICT MODEL FARMS.

A Pamphlet has appeared on the above important subject. The author, however, has not placed his name on the title-page. He is only known there as "A Farmers' Son," but as it is printed by Mr. W. Robinson, of Stockton-on-Tees, we may fairly suppose, that some Cleveland or North Yorkshire agriculturist is the writer. This matters but little, as it is a well-written, common-sense production, and we have pleasure in making a few extracts from it, which will give our readers some idea of the author's opinions:—

He says: "Much valuable information has been diffused by the establishment of private model farms, agricultural societies, books, farmers' clubs, implement depôts, museums, &c. The chief benefit, however, arising from these institutions, has been conferred upon the landowners, and on the best educated and best informed farmers. The great body of farmers, who rarely read a book or travel beyond their market-town, have received comparatively little benefit from them. The evidences of the merits of the various systems for improving agriculture have not been brought home to them. To such men evidence must be carried; they will not attempt to seek it, by stepping out of their regular course."

After some further remarks he proceeds to lay down his plan as follows:—

"I have no doubt that in almost every district of England a farm might be selected which would pretty nearly represent every description of soil in the neighbourhood. In this part of the kingdom we select the neighbourhoods of Newcastle, and the vale of Cleveland. I propose, then, that a farm be selected which has been managed under the prevailing system of the district, (if undrained, all the better.) On this farm the practice of the most antique and the most modern farmers should be adopted simultaneously. Let a part of each field remain undrained, as before: and other portions be drained, according to the plans of Mr. Smith of Deanston, Mr. Parkes, and other authorities on the subject. Use the subsoil plough on a portion. It is often said by farmers who advocate shallow drains and large tiles, that the water cannot get into the deep drains, particularly if laid with small pipes; some also argue that as the water which enters a drain does so immediately above the drain, it cannot get to the tiles if the clay is "puddled" above the tiles. Now, to my mind, how easily all these debated points might be settled—by the clearest of all evidences, occular demonstration. The writer availed himself of an opportunity of visiting a field on which an eminent agriculturist was making experiments in draining, and so clearly were the results of the different systems of draining shown, that I think I cannot do better than suggest its adoption as part of my project. The following is an outline of his plan:—A field was selected of the same nature of soil throughout. Drains of different depths and distances were made; in some were laid pipes and in others tiles of different sizes; the main drain was dug wide and left open, that it could be ascertained which drain ran the soonest after rain, and which ran off the largest quantity at a given time; in a word, every farmer in the district (whose soil was the same as the field in question) might ascertain, with very little trouble, which system was the best adapted to his land.

"In the first year of the rotation, let the old notion of "bare fallows" be carried out, and have in the same field turnips and other green crops, with different kinds of manure. In the wheat field a portion should be sown broadcast, another ribbed, a third drilled, and, lastly, dibbled—testing, also, the thick and thin sowing theories. When spring approaches, let the weeds grow; hand-hoe one part and horse-hoe the remainder. The same principle of comparison might be carried out with other crops. In manuring, also experiments might be made. Let part of a dunghill be carried out and laid on the land, giving time enough before ploughing-in to allow the moisture to fly off, another part to be ploughed in immediately. Liquid and artificial manures might also be tried at the same time. Cattle and pigs might be put up to fatten in the same condition, that the effects of the various kinds of food might be from time to time tested. The results might easily be arrived at by taking the weights at the commencement, and weighing them from time to time after. In short, through the various important operations of farming, the rival systems might be tested together. The only matter which now occurs to me, in which uniformity would be desirable, would be in the rotation of crops." This would be essential to carrying out the plan of comparing the different results at the same time. A correct journal of the various operations and the results should be kept by a disinterested person paid to superintend, and constantly on the land. The farm to be open for inspection at any time; and on certain days, at given times; the superintendent to show visitors round the farm, and give all needful explanation of the various modes of culture. Meetings at convenient periods of the year to be held for the exhibition of implements (old and modern) at work. Let notice be given of a public inspection of the various departments of the farm, holden (say) when the cattle are ready for the butcher, immediately before wheat shearing; and at the time turnip and other root crops are ready to take out of the ground. Let the inspections be followed by public meetings, while the subjects are fresh on the minds of the visitors. Discussions upon the causes of the different results would arise. Let accounts of the results of the various modes of culture be published (at the times stated for the inspections), and circulated through the districts. I have no doubt Editors of news-

papers would most willingly open their columns to such reports."

This, then, is the plan proposed, and the author then proceeds to point out the manner in which a farm might be obtained—how the sum required might be raised, and then concludes by stating the advantages of a District Model Farm, over the Model Farms hitherto established.

The pamphlet, throughout, is worthy of a very careful perusal, and every agriculturist should at all events, take the trouble to make himself thoroughly acquainted with the subject of Model Farms.

Grafting.—Grafts should be cut early in the month. No pains should be spared to procure them from the best sources—the difference between a good and bad scion for a single tree, may make a vast difference in the value of the crop in future years. Grafting is a simple operation; and every careful farmer, or his son, may do the work for himself, and more satisfactorily than to employ others. The grafting wax may be prepared in different ways. The cheapest composition is made of one part, by weight, of beeswax, two of tallow, and four of rosin. More beeswax and less rosin adds to its cost, but renders it less adhesive to the hands. Three parts of rosin, three of beeswax, and two of tallow, constitute an excellent grafting wax. It is applied by spreading it, while just melted, with a brush over a thin newspaper, which is cut up with a knife when quite cold, in plasters of convenient size; or it is spread on cheap calico or muslin; or it is worked with wet hands till it may be drawn out in strings or ribbons, when it is alone wound round the grafted part; or it is applied alone while just melted, to the part, by a small brush. Either mode of using is good, provided that the wax when used is warm enough to bear pressure, and cause adhesion closely on every part, and leave no vacant cavities. In cold weather a lantern or chafing-dish will be needed for this purpose.

The operator may suit himself as to the peculiar mode of grafting. But it is very essential to have sharp tools; to have the parts in close contact by pressure; that the outer edges of the wood (and not the outside of the bark) in the stock and graft, may exactly coincide at one point at least; and that all cut parts be excluded from wet and air by wax well applied. Cherry and plum trees should be grafted very early; apples and pears, later.

To prevent confusion in names, only one variety should, if possible, be set in each tree, and the name and number in the row be immediately registered in a book for reference. No one should think of trusting to memory for the name of a single sort.

Budded Trees.—Trees in which buds were inserted last summer, should now be headed down to the bud, that it may grow freely by receiving all the sap. To cause the new shoot to grow straight, leave two or three inches of the stock above the bud; to this the new shoot is to be closely tied as soon as it is a few inches long, and so remain till mid-summer, when the stump is to be pared down closely to the bud.

Fruit trees which lack vigor of growth, should be stimulated with a good coating of old manure, spaded in as soon as the frost leaves the ground. All fruit trees, except of the largest size, which do not stand in ground kept constantly cultivated by the hoe, should have a circle *several feet* in diameter, spaded around them. Soap-suds, especially for peach trees, are fine. All trees are benefited by it.

Orchard Caterpillars.—Take them early, and their destruction is easy; let them flourish for awhile, and it is exceedingly difficult. Their eggs are now found in nests or rings of several hundred each, near the extremities of the youngshoots, and at a few feet distance appear like small knobs on the branches. They are now quickly clipped off and burned; every one thus removed preventing a large nest of voracious caterpillars. As soon as the buds begin to open, they hatch, and remaining for a few days in their small nests, give them a conspicious downy appearance, when the remainder, if any should chance to have been left, should be speedily removed and destroyed, as they will soon increase rapidly in size and mischief.

Preparing for Transplanting.—Those intending to transplant fruit trees, should have the ground well prepared in season, by digging ample holes, and preparing the soil in the best manner. Let the holes be six or seven feet across, and all the outer portions, or those not to be in immediate contact with the roots, filled beforehand, if convenient, with a mixture of old rotted manure with soil. This will give the young trees a vigorous start until they come into bearing, and in the meantime the ground should be gradually enriched around them by manuring the crops. It would be still better, if the ground for the young orchard could be for two years previously well prepared for trees, as follows:—First run the subsoil plow as deeply as possible, to loosen the soil for the entrance of the common plow, or trench-plowing, the latter operation for the purpose of working manure deeply below the surface, and for intermixing thoroughly the surface soil, subsoil and manure. Two years of such cultivation, with carrots and other roots, will bring land to the finest order, and even one year would be eminently useful.—*Albany Cultivator.*

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, APRIL, 1848.

TREES.—In our last we submitted some observations relative to the general destruction of the forests where new lands are being cleared and settled. The subject is one of more consequence than is generally imagined, and it is high time that some measures should be adopted to secure the preservation of a reasonable proportion of the natural forest and the trees upon every farm. As to its being profitable to the settler, to destroy all the trees as he clears the land, it is a great mistake to suppose it. On the contrary, we are convinced that a farm cleared of all the trees will not be so valuable for any purpose, as one that has a reasonable proportion of trees reserved judiciously in proper situations. We regret to have to state that the cleared farms, on many of which there is scarcely a tree left, are far from being in a proper state of cultivation, and that one-half or two-thirds of these farms kept in good cultivation, reserving the other half or one-third in wood, would produce much more crop and profit, than by clearing off every tree, and cultivating the whole imperfectly. Excellent pastures may be had, by partially clearing the natural forest and sowing grass-seed. All the healthy and choice trees might be reserved, of whatever variety, cutting down all the others. On opening the forest sufficiently for sown grasses to grow, the seeding down and pasturing would prevent the growth of underwood. There is no necessity to leave too many trees where pasture is required, but when first cleared, it would be prudent to leave more trees than would be ultimately required, because some are sure to decay, and should it be otherwise, it will be in the power of the farmer to thin them out subsequently. On every farm a portion of the forest might be thinned in this way and reserved for pasture and ornament. Together with this, a few trees might be reserved, in many situations, on the farm, by the line fences, and where they would not interfere injuriously with the farmer's operations. The time for thinning the forest and clearing underwood, is before the leaves exhibit any change of colour, for at that period they are not so liable to sprout again. The fire should not be allowed to pass over the land where trees are reserved.

We frequently have had an opportunity of seeing most beautiful trees that had been spared by early settlers here, cut down one after another, barely for the sake of the firewood they produced. These trees were, in most instances, situated by the fences—and where they could not cause much injury to the farmer—so that it was almost a crime to destroy them for their paltry value as firewood. The shade alone they would afford to the farmer's cattle would be a hundred-fold more valuable than the firewood they would produce. It would be a national benefit if the country would pay for such trees, rather than allow them to be cut down.

NOTICE.

In conformity to the Rules and Regulations of the Lower Canada Agricultural Society, the Annual General Meeting of the Society will take place on Tuesday next, the 21st instant, at half-past ten o'clock, A. M., at Donagana's Hotel, in this City, for the purpose of electing Directors for the ensuing year, and for other business of the Society.

By order,

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

Montreal, March 16, 1848.

According to the above Notice, published in the Montreal newspapers in both languages, the Lower Canada Agricultural Society held their Annual General Meeting this day, at Donagana's Hotel.

Several Members being present, it was proposed by Major Campbell, seconded by A. LaRocque, Esq., that the Hon. Wm. Morris do take the Chair.

The Report of the proceedings of the Society for the past year was then read by the Chairman, unanimously approved of, and ordered to be published in the Agricultural Journals of the Society, both in the English and French languages.

It was then moved by Capt. Clark, seconded by the Hon. A. N. Morin, Speaker of the Legislative Assembly, That the following gentlemen be ballotted for to serve as Directors of the Society for the ensuing year. When the election was finally determined, the following gentlemen were declared duly appointed:—

Honbles. A. N. Morin, F. P. Bruneau, William Morris, P. H. Knowlton, Col. Taché, L. H. Lafontaine, Adam Ferrie, D. B. Papineau, and William Badgley; and Messrs. J Yule, J. L. DeBellefeuille, T. O. A. Turgeon, D. Armstrong, M.P.P., M. Pinsonnault, Major Campbell, Dr. Bontillier, M P.P., Dr. Meilleur, M. T. A. N. Archambault, J. M. Lamothe, R. N. Watts, M.P.P., Dr. Taché, M.P.P., Joseph Cauchon, M P.P., John M'Connell, M.P.P., Charles Penner, Wm. Evans. T. Bouthillier, André Vandandaique, W. Locker Felton. J. Gibb, P. Lachapelle, J. Guilbault, S. C. Monk, Esquires.

The Secretary was instructed to prepare Reports forthwith, and statements of the funds of the Society, for the several Branches of the Legislature, to be presented on the 22d instant.

The Directors elected who were present, instructed the Secretary to write to the several gentlemen elected, acquainting them of their election, and requesting them to meet at this place on Tuesday next, the 28th instant, at 11 o'clock, A.M., for the purpose of electing a President, Vice-Presidents, Committees, &c., in conformity to the Rules and Regulations of the Society, and for other business that may be submitted for consideration.

Mr. Watts, M.P.P., proposed, seconded by Mr. Yule, a vote of thanks to the Chairman for his proper conduct in the Chair.

The meeting then broke up.

By order, WM. EVANS, *Sec. L.C. A. S.*
March 21, 1848.

REPORT

OF THE LOWER CANADA AGRICULTURAL SOCIETY, SUBMITTED TO THE ANNUAL GENERAL MEETING OF MEMBERS, HELD AT DONAGANA'S HOTEL, MONTREAL, MARCH 21st, 1848.

A year has now elapsed since the Society was first instituted, and although they have not been able to accomplish all the objects for which the Association was organized, they have the satisfaction of stating that they have made some progress.

First—By publishing in the English and French languages, and circulating throughout the country, "The Primary Objects of the Society," "The Rules and Regulations," by which they were to be governed, and an "Address to the Public," appealing to them for support and co-operation, in carrying out their views for the improvement of Agriculture.

The next measure they adopted was, to commence the publication, on the first of January last, of the "Agricultural Journal, and Transactions of the Lower Canada Agricultural Society," both in the English and French languages, and they are happy to be able to report that the Journals have now an extensive circulation—nearly one thousand of the first, and between two and three thousand of the latter, with every prospect of the circulation becoming much more extensive before the close of the year.

The Society expect these publications will create a general interest for Agriculture, as well as afford much useful information, and practical instruction, in the science and art of Agriculture. Their columns are open to all useful communications on these subjects, while any matter that could give offence to any class or any party, is strictly excluded—the sole object of the publication being the augmentation of the general produce of Canada in quantity and value.

It may be imagined that the expenses incurred for these publications are of considerable amount, and make it necessary that the sub-

scriptions should be paid up as soon as possible, to enable the Society to meet the engagements they have entered into, as they have not, at present, any other funds at their disposal.

The Society have not yet in their power to take any measures for establishing Agricultural Schools, and Model Farms, although several offers have been made by landed proprietors to place farms at the disposal of the Society, for that purpose, for a term of years. The Seminaries of St. Hyacinthe, and St. Anne's, have also signified their willingness to have Model Farms established at these places, connected with schools for giving an Agricultural education, and the necessary practical instruction to young farmers. The want of adequate funds for such an undertaking has, however, obliged the Society, most reluctantly, to postpone taking any action in the matter, although convinced it would be the most certain mode of promoting the improvement of Agriculture, bringing before the people the most approved system of husbandry in actual operation, and the results obtained from this system—all open to inspection, and full explanation to every visitor.

An Agricultural Library and Museum are appendages that should not be wanting to the Lower Canada Agricultural Society, to enable them to carry out successfully their objects; and they regret that the metropolis of this noble country should not now possess an Agricultural Library and Museum, equal, at least, to any on this continent, considering how entirely the country is dependent upon her agriculture.

The Society have materials to commence a Library, that would very soon be augmented to an extent that would ensure its usefulness to the Agricultural class. However "Book-farming" may be despised, there is no other means open to us of becoming acquainted with the improvements introduced into other countries, by the employment of skill and capital, and the results obtained from experiments, except by reading and publishing what information we can obtain respecting these matters.

The Museum should be furnished with the most approved Agricultural implements, or the models of them, and choice samples of seeds of every variety suitable for Canada. For all these a convenient place would be required, and there should not be any difficulty in obtaining such in Montreal for this purpose.

In order to follow, as closely as possible, the example of the National Agricultural Societies of the British Isles, this Society are most anxious to hold a great Annual Exhibition of Agriculturul Stock, Implements, Produce, and Domestic Manufactures, that would bring farmers together from all parts of the Province, and thus give them an opportunity to examine and estimate the comparative qualities, excellence and defects of stock, implements, produce, and manufactures—a means of information, instruction and encouragement, that could not be obtained so well in any other way. The Society conceive that such exhibitions, annually held in different parts of the Province, are as necessary here for the promotion of Agricultural improvements, as they are found to be in other countries for a similar purpose.

The Society with great satisfaction acknowledge the general support and encouragement they have received from the Roman Catholic Clergy, many of whom have become life and annual members, and, generally, subscribers to the Agricultural Journal. Without this support, the Society are persuaded they would not have such flattering prospects of success with the rural population as they are, from this circumstance, encouraged to entertain. Indeed, from all quarters, the Society receive the most unequivocal proofs, that a lively interest is now generally excited for the improvement of Agriculture, and all that is required to secure this most desirable object, is the adoption of such measures as will maintain this favourable feeling.

From the prospect of a short Session of the Legislature, the Society thought it most expedient to defer making any application for an aid this Session.

The Society submit to this meeting the

record of their Transactions, and a full statement of their money affairs for the past year.

The Society would observe, in conclusion, that if this meeting approve of what has been done as a commencement, and are satisfied that the objects for which the Association has been formed, are commendable, and calculated to promote the general welfare of the people, they will forthwith adopt measures to ensure the prosperous working of what has been commenced, and which can only be accomplished by a union of all who feel convinced that every class of the Canadian community are deeply interested in the prosperous condition of Agriculture, and that its products annually created, should be excellent in quality, and abundant in quantity.

All which is most respectfully submitted.

Pursuant to written notices addressed to the Directors, a meeting took place this day at Donagana's Hotel in this city, for the purpose of electing a President, Vice Presidents, a Secretary, and Committees. Directors present: Hon. A. N. Morin, Speaker of the Legislative Assembly; Hon. Colonel Taché, Hon. Wm. Badgley, Major Campbell, John Yule, Alfred Pinsoneault, S. C. Monk, J. E. Guilbault, J. B. Meilleur, Tancred Bouthillier, and Wm. Evans, Esquires. It was moved by Major Campbell, and seconded by the Hon. Colonel Taché, that the Hon. A. N. Morin, Speaker of the Legislative Assembly, be elected President of the Society for the ensuing year, which was carried unanimously. The President then took the Chair. Six Vice-Presidents were elected, namely, Hon. Colonel Taché, Hon. P. H. Knowlton, Broome, Hon. F. P. Bruneau, Dr. Bouthillier, M.P.P. St. Hyacinthe, R. N. Watts, M.P.P. Drummondville, and James Gibb, Esq., Quebec. Wm. Evans was elected Secretary of the Society. The following Committees were named:—

Journal Committee:—Hon. A. N. Morin, Hon. Col. Taché, Hon. Wm. Morris, Major Campbell, and S. C. Monk, Esq.

Finance Committee:—Hon. A. N. Morin, Hon. A. Ferrie, and John Yule, Esq.

Executive Committee:—Hon. A. N. Morin, Major Campbell, and Alfred Pinsonneault, Esq.

It was proposed by Major Campbell, and seconded by Alfred Pinsonneault, Esq., that Mr. George Shepherd be appointed Seedsman to the Society; which was adopted unanimously.

The Secretary was instructed to address a letter to Mr. Vandandaique, urging, on the part of the Society, his final acceptance of the office of Director.

The proof sheets for the April number of the English Agricultural Journal were placed before the meeting, by the Secretary.

The proceedings of the meeting were ordered to be published in the April number of the Agricultural Journal, in the English and French languages.

The meeting then broke up.

By order,

WM. EVANS,
Secretary L. C. Ag. Society.

Montreal, 28th March, 1848.

AGRICULTURAL REPORT FOR MARCH.

During our residence in this country, we do not recollect to have seen, at this period, the lands so free from snow, and the drains from superfluous water. If the season continues to go on favourably, the farmers will be able to put in their crops in good time. The winter has been of a different character from any known here for the last fifty years—exceedingly mild, very little snow, and not more than three or four snow drifts during the whole winter. Nearly three-fourths of the days in the last three months have been fine, and the temperature generally high. We do not know what effect the past winter may have on grass lands, but any we have seen do not appear to be much injured, though we can scarcely expect that they will be free from some degree of injury, particularly in wet lands, or those

recently seeded down. The frost, we hear, has entered deeply into the ground, in consequence of no covering of snow, but we doubt this, as there were only a few days of very intense frost, and many thaws. The greatest evil to be dreaded, from the frost entering into the ground, is, that it will be a long time before it is all out of the soil; it keeps the surface damp and wet, and unfit for working or sowing. Whatever may be thought of the last winter, we do not believe that such mild winters would be so favourable for Canada generally as those we have usually had heretofore. We have heard great complaints of the inconvenience and loss experienced by farmers this year, in consequence of the want of good winter roads. We trust the fall sown wheat of Upper Canada may not have sustained any damage. The last year's crop in Eastern Canada did not thresh out so well as the farmers expected, last harvest. We cannot reasonably expect abundant crops in ordinary seasons, unless we cultivate and prepare our lands properly for them. It is in the spring we must endeavour to secure good returns in harvest, by doing all in our power to cultivate the lands well. Whatever may be the result, it is the duty of those who occupy lands to cultivate them so that they shall yield a good produce, if they possess the means to do so. The farmers may rest assured that the more abundant and excellent is their produce the more ample, their means for comfort and enjoyment. The present prices of produce should satisfy the farmer, provided his produce is what it might be. We do not expect that these prices are likely to fall for this summer. There is not much doubt that a good demand will continue for some time for any surplus produce we may be able to raise, and it would appear that at this moment there is every encouragement to farmers, to exertion, to raise good crops of saleable produce that would be fit for exportation. The season has been favourable for cattle; they do not consume so much food in moderate weather, or require so much as when very cold, and from present prospects, they will soon be able to find food on the pastures.

March 30th, 1848.

This Journal has an extensive circulation, and would be an excellent medium for advertising any matters connected with Agriculture or its products. The charge will not be higher than that of any other journal. Agriculturists, we might expect, would give their support to a publication that in reality belongs to them.

The Society will now have a place with their Seedsman, where any Agricultural implements will be received in deposit for the owners; and any of those implements that may be approved, and required by those who see them, may be ordered from the manufacturer, who would be sure to receive payment for them.

We have been handed the following article by the President of the Society, Major Campbell, who received it from a correspondent, Mr. Harrison, of St. Ours, and we copy it without any alteration. We shall, in our next number, give the Flemish and Irish methods of growing and managing flax. The mode of steeping, and quality of the water, are very essential to the good quality of the fibre, and this part of the subject is not sufficiently explained in the following Essay. A clover lay, ploughed well in the fall, is said to be an excellent preparation for flax, but the grass must be effectually turned and covered. When flax is sown on a clover lay, it is not likely to produce much weeds, and this is a great advantage in growing flax. The improved method lately introduced in Ireland, for the cultivation and management of flax, is said to succeed admirably, and there is nothing to prevent us following the same plan in Canada. The Lord Lieutenant of Ireland has lately given £1000 to the Irish Flax Improvement Society, to assist them in carrying out their laudable objects:—

CULTURE OF FLAX.

From Essays—BY S. W. POMEROY.

Flax, says the author of the Treatise on Agriculture, (Armstrong,) is of Asiatic origin, and from its hardiness and usefulness is generally diffused over the globe; no plant undergoes a greater change in the hands of labour, and few better repay the labour bestowed upon them. It is cultivated with two different views—one for the fibre which surrounds the stem and which is converted into cloth—the other for the seeds, which yield an oil very important to the arts; these different objects have been supposed to be best promoted by different kinds of seed and different kinds of culture. This difference, however, is supposed to depend more upon the culture than on the variety of the seed, for it has been invariably observed, that if flax seed (wherever grown) be sown thinly, the stem is shorter, the fibre coarser, and the seed more abundant; and that when it is thickly sown, the fibre is of greater length and much finer. This difference can be still further increased in the culture; the row husbandry, admitting of more ventilation, will hasten the maturity of the plant, and increase the quantity and quality of the seed; whereas the broadcast method will, on the other hand, retard the maturity of the plant, lengthen the stem and the fibre that covers it, and in the same proportion diminish the quantity of seed.

Flax may be made to follow potatoes very advantageonsly, and we have seen the practice of sowing it after a crop of that kind earnestly recommended.

The time for harvesting flax depends on the considerations suggested above; if seed be the principal object of the crop, the harvesting ought not to begin till that is completely ripe; whereas if the fibre be the main object, the flax should be pulled two or three weeks earlier. Flax when prematurely killed is called white flax, and makes the finest thread. The exhausting quality of the plant has been long known and is generally admitted. Pliny says of it that it burns and degrades the soil, in return for the nourishment it receives from it.

SOIL.—The soils which rank first in this country as most suitable for flax are the flat bottoms that are covered with fall and spring floods which subside early enough in the season to get in a crop. The next in estimation are the strong black loams or clay, or hard pan, that will retain moisture. Yellow loams, with a holding subsoil, may be rendered suitable for flax by a proper cultivation; and since the discovery that Plaster of Paris is an excellent manure for it, a crop may be obtained on lighter land with much more certainty than formerly. Perhaps the characteristic of best garden mould may be applied to a flax soil, viz., retaining sufficient moisture, and all that falls, without ever being saturated; but on any soils the surface should be completely pulverised, and never be worked when wet.

Manure.—No dung should be applied to the land when the flax is sown, but may be put on plentifully with the previous crop. Lime, marl, shells, leached ashes, &c., are not liable to the same objections as dung, viz., producing too rapid a growth.

Top-dressings, soon after the plants appear, of plaster, ashes, soot, &c., are highly beneficial, as they not only encourage the growth but are a protection against worms, which sometimes attack young plants, and may be considered the only enemy they have except weeds. Salt has been mentioned as an excellent manure to plough in with flax at the rate of five bushels to the acre—probably more would be better.

The best preparatory crops are potatoes, corn, and roots.

Seed.—That of the last year's growth should be obtained, if possible; the usual marks of good seed are, that it be plump, oily, and heavy, of a bright brown colour, sinking readily in water, and when thrown into the fire, to crackle and blaze quickly With regard to the quantities to be sown, no particular directions can be given, as it depends on the various qualities of soil, goodness of seed, &c. It requires to be sown thickest on rich soil—from two to four bushels is about the quantity usually sown. Thick sown is to obtain good flax—thin is to obtain seed.

Sowing.—It is recommended to sow as early as possible, and in the broadcast method, to distribute the seeds equally.

Weeding is considered necessary to secure a good crop of flax, which is a very tender plant when young, and more easily checked in progress by weeds than any other; this should be carefully done when the plants are three or four inches high.

Pulling.—This should be performed as soon as the leaves begin to fall, and the stalks show a bright yellow colour, and when the bells are turned a little brown.

When the flax is lodged, it should be pulled immediately in any stage of its growth, or it will be entirely lost. Great care is requisite in sorting the different lengths, and keeping them separate till after the flax is hecked, or much waste will ensue in that process.

Sowing Seed.—As soon as the flax is dry enough to be put under cover, it should be rippled, as it is termed. A comb resembling the head of a rake, but with teeth longer and nearer together, made of hickory and oak, is fastened upon a block, and the flax, taken in parcels, no larger than the hands can firmly grasp, is drawn through, and the bolls rippled off; attention to sorting, at the same time, should be continued.

The bolls are to be riddled and winnowed immediately, spread thin on a clean floor or on sheets in the sun, and when sufficiently dry, and beginning to open, threshed.

Product.—It is by no means uncommon in Europe to obtain eight hundred pounds of flax from an acre, but then little seed is obtained; the average crop is about two hundred pounds, and six or eight bushels of seed; four hundred pounds of good clear flax, and eight or ten bushels of seed, may be procured under favorable circstances.

The preparation of flax by steeping is very general in the great flax-growing countries of Europe, but it is not quite finished in the water; it remains spread some days on the grass, which is necessary to render it soft, and give that silvery appearance so desirable. The destructive process of dew rotting is most commonly resorted to in this country, and when water is used, it is at an improper season, and the process imperfect, which is the cause of its being so harsh and brittle.

The flax should not be put into the water until about the first of October, and remain from ten to fourteen days, according to the temperature of the weather, and should be taken out before the fibres separate freely, and spread on the grass when the frost will very much assist the operation, and the flax exhibit a gloss and softness which it is impossible to give it otherwise; the dressing is done by hand or by machinery, impelled by water, &c.

The following observations on the effects of a crop of flax upon the soil, we copy from a late number of the Mark Lane Express:—

Though I admit that flax is an exhausting plant, in the proper sense of that term, yet my analyses and calculations show me that it does not rob the soil half so much as some of the most favourite crops of the farmer. I have prepared some tables, which will enable you to understand this statement. The flax plant referred to in the calculation was grown in the north of Ireland. I will give you the amount of phosphoric and alkalies contained in a hundred parts of the ashes of the stems of that plant, compared with that afforded by some of our ordinary crops.

One hundred parts of the ash of the following plants contain

	Phosphoric Acid.	Potash and Soda.
Flax	7	12
Wheat-straw	3	13
Oat do	3	29
Bean do	7	55
Red clover	8	36
Cabbage	12	32
Potato-stalks	7	44
Turnip-tops	9	34

It appears, therefore, from the above table, that a hundred pounds of the ashes of flax straw contain a larger amount of phosphoric acid than the ashes of the straw of wheat and oats, the same quantity as the ashes of bean straw and potato tops, but not so much as is found in the ashes of the cabbage, of turnip tops or of red clover. This plan, however, of comparing the exhausting effects of these crops—though it has been adopted, in some of the discussions on this subject—is not the most instructive way for the farmer to look at the question. It is only when we consider the amount of the valuable matters of the soil, which the ordinary produce of the usual crops takes away from an acre of land, that we can judge of the effects which their production must exercise upon the stock of matters contained in the soil, and, consequently, the degree of exhaustion which they occasion. The ordinary produce of one statute acre of the following crops takes away from the soil:

	Total.	Phosphor. acid.	Potass.
Flax straw, two tons yield, of inorganic matter	224 lbs.	contain 15½ lbs.	14 lbs.
The tops of 12 tons of potatoes	270	20½	77½
The tops of 25 tons of turnips	387½	36	111
Six bushels of flax bolls, dried weight 960 lbs.	48	18	11
The ash of the straw	224	272 15½	33½ 14
12 tons of potatoes, stalks and tubers	870	96	409
25 tons of turnip tops and bulbs	812	68	289

It appears, therefore, from the above table, that the ordinary produce of flax takes away, per acre, a less amount of valuable ingredients than either the turnip or the potato. If we apply a proper manure to the soil, and the flax bolls be used for feeding, and thus added to the manure heap, all the mineral ingredients which the crop takes away may be perfectly restored, and the exhausting effects of the cultivation of the plant removed, without the necessity of having recourse to the generally impracticable methods which have been insisted upon as necessary for that purpose, but which, I have shown, could not give back all that the plant takes away. Now, a nanure for this purpose may be cheaply prepared, and after an analysis of the plant, I consider that all the inorganic matters which two tons of the flax straw remove from the soil might be replaced by the following compound:—

	s.	d.
Muriate of potash, 30 lbs., which cost about.	2	6
Chloride of sodium, common salt, 1 cwt.	0	3
Burned gypsum, 34 lbs.	0	6
Bone dust, 54 lbs.	3	3
Sulphate of magnesia (Epsom salts), ½ cwt.	5	0
	11	6"

Doctor Hodges then proceeded to show, that, in this part of Ireland, by the use of kelp, a manure might be prepared at even a cheaper rate.

Butter.—To "Dairy Farmers."—Dr. Ure remarks in one of his recent works, and which remark may very well be taken as an answer to your question, that "it is computed a cow which gives eighteen hundred quarts (old English) of milk per annum, eats in that time eight thousand pounds of hay, and produces one hundred and forty pounds of butter." "Two pounds and a quarter of hay correspond to one quart of good milk; and a cow which eats sixteen thousand five hundred pounds of hay will produce three hundred pounds of butter per annum."

CULTIVATION OF THE APPLE.

Having been practically acquainted with the Apple tree for more than thirty years, and being anxious to see this tree more successfully cultivated, I am constrained to give publicity to my observations, experience, and mode of culture, hoping that some may be instructed, and the attention of others awakened to this interesting subject.

The apple tree is the most valuable fruit tree that grows in this part of the world—is naturally very long lived, very productive, and easly cultivated, requiring but little more attention every year than a hill of corn: and yet, strange as it is, there are not half enough good apples produced for family use.

Trees may be procured of the nurserymen, or be raised on your own premises. If the latter course is taken, procure as many seeds as you want from the kind of apples you wish to produce. They will not all of them produce the same kinds—a few will be the same or similar, and others new varieties—nearly all will be very good, if the seeds were of good kinds. Plant your seeds as soon in the spring as the frost is out, in good mellow ground, about a quarter of an inch deep, in rows. Keep the ground mellow and clean, and in about three years they will do to set in their abiding place, or to graft.

Trees of natural growth generally last the longest. In the selection of the kinds you prefer to graft, do not disregard those that are uniformly good bearers, and prefer grafts from young healthy trees. Cut the last year's growth with an inch or so of the year before, if you wish to keep them awhile. If you cut at all from an old tree, take a last year's sprout, well matured. The nearer the time of running of the sap the better, but if most convenient, they may be cut and kept in a moist place some weeks. As soon as the sap runs, remove the soil from around the tree about an inch deep, insert your graft smoothly, and bring the soil around it about an inch above the insertion. In about two years your trees will do to set in their abiding place.

In selecting a place for an orchard, prefer upland or hill-sides. The fruit will be richer, higher flavored, and more abundant, than on low, flat lands Almost all kinds of soil will do, if they are deep, rich, and well cultivated. In this vicinity, the soil called *iron stone*, is lately the most productive. It is believed by some that an eastern exposure is liable to blast; but I have not found it so.

Dig the holes for your trees a little larger than the extension of the roots, and about eight or ten inches deep. Take up your trees carefully, without breaking the roots, and the sooner they are set in their places the better. Set them just about as deep as they were in the nursery, filling the holes with just what was taken out and nothing else. Many trees are greatly injured by being set two deep. Set a stake about a foot from the tree, leaning to it, of equal height, and tie the tree loosely to the stake. Plow or dig the soil mellow, around the tree, two or three feet from it at least, in the spring of every year, to the depth of three or four inches, but not to injure the roots

In cultivating your orchard, a good arrangement, is to plow one or two years, and leave the ground one or two years in clover—keeping the soil rich with manure. This mode is much better than to put heaps around the tree, and bury the roots too deep. Just before the sap runs, every spring, prune, but in doing this, be careful not to prune too much. I have seen a great many orchards nearly ruined by pruning too much. The supposition that more sap and nutriment is obtained by the remaining branches when some are removed, is a mistake. The branches constitute a part of the tree, and do their offiice in furnishing nourishment just as much as the roots. The lower limbs of the top should be about four and a half feet from the ground; and here let a full and natural top be commenced. I have never known a very large tree, nor a good bearing tree, among those that had high tops, either by cutting off the lower branches, or by trimming them up high.

A great many apples are lost by leaving them too long on the trees. Winter apples, as soon as the seeds are ripe, should be picked, and taken to a cool, dry, shady place, spread thin, and lay without cover, until there is danger of freezing. When there is danger of this, remove them to their winter quarters, which should also be cool, just as to avoid freezing. Put them on shelves, not more than two or three courses thick; and if put in a cellar, the shelves should be at least three feet high from the bottom. Leave them uncovered, and remove the decayed ones, as occasion requires; and in all that you do, be careful not to bruise them in the least. I have kept Newtown Pippins in this way until August.—R. K. Tuttle.

Moristown, N. J., February 4th, 1848.

CULTIVATION OF ONIONS.

The cultivation of onions is in many sections an imporant buisness. In some parts of Connecticut, Massachusetts, and other places, they are raised in large quantities, and disposed of both for home consumption and for exportation. As we have had many inquiries in regard to the culture of this vegetable, we think we cannot give the information desired in a better manner than it is embodied in the following Essay which was written by John W. Proctor, Esq., and received a premium from the Essex (Mass.) Ag. Society. At our request Mr. P. has furished a drawing of the "Onion Hoe," which has enabled us to give a cut and description of the implement in connexion with the Essay:—

The culture of onions has increased so much, within a few years, in this vicinity, that it has become one of the staple products of the county.

In the town of Danvers, more money is realized from the sale of the onion, than in any other product of the soil. Products of so much value, and commanding so much attention, are fit subjects of inquiry; and if there be any facts relating to their cultivation not generally known, it may be useful to have them brought forward.

In making these inquiries our attention has been directed almost entirely to practical cultivators, without reference to scientific treatises. Our intention being to tell their story, as nearly as possible in their own way.

We shall treat of the subject in the following order:—

1. The preparation of the land.
2. The manure best adapted to promote the growth.
3. The raising and planting of the seed.
4. The care necessary to be applied while growing.
5. The blights and injuries to which the crop may be liable.
6. The time and manner of harvesting.

1. As to the preparation of the land.

Differing from most other crops, the onion grows well on the same land for an indefinite number of years. Instances of continued appropriation of the same pieces of land to the growing of onions, for *ten*, *fifteen*, *twenty*, and even *thirty*, *years*, have come to our knowledge. It is the opinion of many that the crop is better, after the land has been thus used a few years, than at first. Whether this arises from any influence of the crop upon the soil, or is the effect of continued dressing of manures, we have no means of determining. This is certain, that the qualities of the soil necessary for the production of good crops are not exhausted by continued cultivation.

Rarely, if ever, have we known the onion sowed upon the turf when first turned over. It is usual to subdue and pulverize the soil, by the cultivation of corn, or some other crop. Not unfrequently the first year with corn, the second with carrots, and afterwards with onions. It is important, before the seed is sown, that the surface be mellow, finely pulverized, and clear of stones and other impediments, to the free and unobstructed use of the machine for this purpose. The finer and more uniformly mellow the surface is made, the better. Shallow plowing, say from four to six inches deep, is usually practiced. One plowing only in the spring, and frequent harrowings, are practiced. Before the plowing, the dressing is usually spread upon the surface of the field, so as to be covered or intermixed in the furrow. The mingling and subdivision of it, is effected by the use of the harrow.

Whether it would not be advantageous occacionally, to stir the land to the full depth of the soil, is a point on which there is a difference of opinion; most of the cultivators inclining to the use of shallow plowing only. There are some facts tending to show, that occasional deep stirring of the soil does no harm to the onion crop, but on the contrary is decidedly beneficial. As for instance, onions do better where carrots have grown the year preceding, than after any other crop. The carrots necessarily start the soil to the depth of ten or twelve inches. Possibly there may be some other influence upon the soil from the plant itself. Our belief is, that the thorough and deep stirring of it, is the principal preparatory benefit.

2. The manure best adapted to promote the growth.

Any strong manure, well rotted and finally subdivided will answer. But the general impression seems to be, that manure from stables, where the horses are freely fed with grain, is the best, and that it should be at least one year old, because it will not be sufficiently rotten in a less time. All agree that the dressing for the land should be kept near the surface, well mixed, and as fine as possible. Though we have seen the present year a very superior growth of onions, where green manure from the barn-yard was applied in the spring; but particular pains were taken to subdivide and intermingle it with the soil; and to bush-harrow the land so thoroughly, that very little manure was exposed upon the surface.

Muscle-bed is frequently used upon onion land. A portion of this is deemed by some almost indispensable. We have known the continued use for half a dozen years in succession, even without other manures, with a continuation of fair crops, but the general impression is, that it will not do to repeat the application of muscle-bed many years in succession. The effect being to harden the land, and make too much of a crust about the surface. Without question the effect of the muscle-bed is congenial to the growth of the onion, giving those who live in the vicinity of rivers where it is found, a special advantage over those who are remote from it.

Leached ashes are also a valuable manure in the cultivation of the onion; more so when *leached* than before. All kinds of ashes are advantageously applied on onion land.

Compost manure made of meadow mud and droppings from the cattle, we have known advantageously applied on onion fields; but we have many doubts as to this being the best application of this kind of manure. A more lively and quickly operating manure is better for the onion; one that will give them an early start, and advance them as fast as possible, in the first part of the season. The utmost viligance and activity is used by our cultivators in getting their land ready, at an early period of the season, for the reception of the seed. It is the first field labor of the spring. The use of compost manure will depend much upon the constituents of the soil with which it is mixed. If the soil be a sandy loam, with a porous subsoil, the compost will do tolerably well, but if it be a black soil, with a clayey subsoil,

such as are most of the lands where onions are raised in this vicinity, stable manure, or muscle-bed, or leached ashes, or a mixture of these, will be a better application. The quantity ordinarily applied annually is from four to five cords to the acre. Whatever is applied should be generously applied. It will be in vain to expect full crops of onions, without full manuring. When the manure is collected, it is benefited much by a free application of *elbow grease* in its preparation. The cultivator of the onion must work early and late, and in good earnest. Nothing short of forcible and persevering labor will answer. No man who is afraid of *soiling his hands or the knees of his trowsers* will do to engage in this business. Close work at the proper time, is the only sure guarantee of a good crop.

3. The raising and planting of the seed.

In relation to the onion, as well as all other vegetables, much care is necessary in the selection of the plants for seed, and the cultivation of the seed. By the application of this care, the character of the article raised may be modified almost at pleasure. Until within a few years the *flat onion*, hollow about the stem, has been preferred. The thinner the handsomer. But it is now understood, that the *round, thick, plump onion*, is preferable in many respects. It is thought to yield better, and weigh heavier. It is found to have a decided preference in the market, commanding *ten per cent.* more in price. By selecting those of most desirable form, which ripen the earliest, and carefully setting them for seed, where they will not be exposed to the impregnation of the baser sorts, the quality has been materially changed and improved. These peculiarities in the onion were first noticed in this vicinity by Mr. Daniel Buxton. He was careful to select in the field before the crop was gathered, such onions as he preferred, and to preserve them for seed.

By so doing, the seed which he raised soon acquired a character superior to any other. Many of those who had been accustomed to raise their own seed in the ordinary way, laid it aside, and purchased seed raised by Mr. Buxton, and found their account in so doing. There are three varieties of the onion raised in this vicinity—the *Silver-skin*, the *Red*, and the *White onion*. The *Silver-skin* is the predominant species, and more cultivated than all others. The *Red* is preferred by some—sells better in some foreign markets, but does not yield so abundantly. The *White onion* yields as well as either of the others, is milder and preferable for immediate use; it will not keep as well, and is not fit for exportation, which is the principal use made of our onions.

The common drill machine is used for the distribution of the seed. This admits of regulation, so as to scatter it more or less thick; and in this there is room for the application of sound judgment. The usual qantity sown is three pounds to an acre. As a general rule, we should say, one pound of good seed was the proper quantity for a quarter of an acre of land of good quality well prepared. It is desirable to have the seed planted as thick as they will grow fairly, both to secure a full crop, and prevent the onion growing too large. Onions from one to two inches in diameter being preferred to those of a larger size. The skilful cultivator carefully looks after all these incidents relating to his crop.

4. The care necessary to be applied while growing.

Much of the success of the crop depends on this care. At first the plant is extremely tender, and requires to be handled with much caution. Any derangement of the fibres or roots of the young plant, is attended with prejudicial consequences. Much attention is necessary to prevent weeds gaining the ascendancy, and in eradicating the weeds. Want of due care in this is often the cause of failure of a crop. We have known the present season, a highly promising crop to be injured *twenty per cent.* at least, by permitting the weeds to remain unnoticed *one week too long*. This is especially true when there has been a want of due care in preventing the scattering of the seeds of the weeds on the land in the years preceding. Care should be taken, both that no weeds shall ripen their seed upon the land, and that no weed seed shall be found in the manure. In this respect, warm stable manure, muscle-bed, and ashes, have a decided superiority over all other manures. Perhaps there is no plant more liable to be injured by weeds than the onion. The fibres it sends out are very numerous, minute and tender; any fracture of any of these necessarily impairs the perfection of the plant. When the land is in the proper condition, two careful weedings are all that may be necessary. The rest of the stirring of the ground that may be required to promote the growth, can be done with the *Onion Hoe* (fig. 22,) an instrument specially constructed for the purpose, moving on wheels, and adapted to the width of the rows. It is calculated to pass between the rows of onions —being either drawn or pushed. The wheels cover a space of about one foot in width, and the length of the cutting blade is also about a foot. The length of the handle is about five and a half feet. The usual distance between the rows is fourteen inches, and as the hoe takes a breadth of twelve inches, it cuts over all the ground, excepting a strip of two inches along each row. The cost of the hoe varies from $1.25 to $1.50. It was invented by Mr. Joseph Bushby, of Danvers, an intelligent and successful cultivator of garden vegetables, about 25 years since, and was used by himself and neighbors only for about ten years. It has now come into general use, and saves much of *back-aching labor*. The distance between the rows can be varied according to the quality and condition of the soil. Keeping the ground well stirred, loose and free of weeds, greatly facilitates the bottoming of the onion. There is no plant that will better reward diligent

care in the cultivation. The entire difference between a beautiful crop and no crop at all, often depends on this. The old maxim, "a stitch in time saves nine," applies with great force in raising onions.

5. The blights and injuries to which the crop may be subject.

So far as we have observed, this crop is as certain as any other that is cultivated. We know that onions will not grow without a reasonable portion of heat and moisture; but we have rarely, if ever known, an entire failure in the crop, where due diligence has been used. There are occasionally blights, the causes of which we have not learned. The more prominent will be noticed.

Sometimes we have seen the plant covered with a small insect or *louse*, that gives the top a white or light colored aspect, and stops and stints the growth. These make their appearance about the time the bottoming commences. We have heard their appearance charged to the use of muscle-bed; but whether they are limited to land on which muscle-bed has been used, we cannot say. We think not. We think they are natural associates of the plant. The effect of them is to diminish the *quantity*, but not materially to injure the *quality* of the vegetable.

The crop is sometimes injured by a *blue mould* that gathers on the tops, occasioned by fogs, or an excess of moisture from frequent and long continued rains.

There is a *worm* or *maggot*, occasionally found upon the onion plant, in the early stages of its growth, causing it to turn *yellow* and die. This insect will be found in the bulb, originating from eggs laid upon the leaves, by a small ash colored fly, the scientific name of which is said to be *Anthomyia ceparum*, (See Transactions of the N. Y. State Ag. Society for 1843, page 135.) It comes to maturity in less than a month, so that there may be several generations in the course of the season. Their appearance in this vicinity is rare. Pulverized charcoal and fire have been found the most effectual remedies, against the ravages of this class of depredators.

The most annoying enemy of the onion is the *cut worm* or *grub worm*. It probably is the same described by Dr. Harris, in his Report on the Insects of Mass. injurious to vegetation, p. 324, there called "*Agrotis devastator*." And in the 1st vol. of Silliman's Journal of Science, *Phalæna noctua devastator*;" though Dr. Harris does not mention the *onion* as among the plants upon which it feed; probably considering it like *tobacco* as too nauseous to be used by any decently civilized being. They are said "to seek their food in the night, or in cloudy weather, and retire before sunrise into the ground, or beneath the stones, or any substance which can shelter them from the rays of the sun; here they remain coiled up during the day, except while devouring their food, which they drag into their places of concealment." The remedy for these worms, suggested by cultivators, corresponds nearly with that proposed by Mr. Foote, of Berkshire, "*to catch them and pull their teeth out.*" This being effectually done to all, their operations will be of a limited character. When this is omitted, we have *sometimes known whole fields almost entirely cut* down by these rapacious devourers. They sweep clean where they go, not suffering even the weeds or any other herbage to flourish. They are more frequently found on *old* ground than on *new*; and particularly where the ground has been covered during the winter with *chickweed or other vegetable substance*, on which the eggs from which they originate may have been deposited. Hence the benefit of clearing the ground of all vegetable matter or other obstructions in the autumn, after the crop is gathered. This clearing also facilitates the early planting in the spring Autumnal plowing, as it exposes the soil more fully to the action of the frost, and disarranges all abodes for the winter made by insects, may have a tendency to diminish their number.

6. The time and manner of harvesting.

When the tops begin to wither and fall, then it is usual to start the onions from their bed, and throw them together in rows—say eight or ten growing rows into one. After they have lain thus about one week, they are stirred and turned with a rake, and in about one week more, when the ground is dry, and the weather fair, they are gathered up by cart-loads, and taken to the barn. Here they are sorted and cleared of refuse leaves, and then they are in a condition to be *bunched* or *barreled.*

It should be remarked, that a large part of the labor of *weeding*, *gathering* and *sorting* the onion, can be performed by children from *ten* to *sixteen* years of age. Boys of this age, when properly instructed, will do about as much as men. They are more nimble, and can come at the work with greater facility. The sorting of the onions is frequently done by girls as well as boys. From *three* to *five* dollars a week, at one cent a basket, are usually earned by them during the period of harvesting—which includes the months of September and October. After the crop is taken off, if the surface is sloping, it is useful to plow furrows about one rod apart, to keep the surface from washing. Unless this is done, all the herbage being gone, much of the soil will be likely to be misplaced, by the melting of the snows, and running of water in the spring.

The inquiry arises, whether the growth of the onion is limited to soils of particular character, or whether it can be cultivated upon any good soil, with proper attention. We know that there is a popular impression, that there are but few places in which the onion can be cultivated advantageously. So far as our own observation has extended, this impression is in a great measure erroneous. Like every other plant, the onion grows best on very good soils, in very good condition. But we have known very fair crops, on

plain, light land, after the same was well saturated with *manure*, *muscle-bed* or *ashes*. A good substratum must be laid before a good crop can be expected; and this being done, a crop may be expected on almost any soil, that will support other vegetables.

If we were asked, what course is best to be pursued with land, on which onions have never been raised, to bring it into a condition for a successful cultivation of the crop, we should say—begin by plowing to the full depth of the nutritive soil, and during the first and second years, thoroughly subdue and mellow the soil by the cultivation of crops of corn and carrots, with liberal dressings of manure; then thoroughly incorporate with the soil a dressing of strong manure and muscle-bed, just covering this dressing; then harrow the surface thoroughly, and clear it of all roots, weeds, or other obstructions; then apply a coating of lively, well rotted manure, to the surface, and bush-harrow it; and then it will be in a condition to receive the seed, which is to be inserted as soon as the opening of the spring will admit of its being done.

We are aware that we make the raising of the onion dependant upon severe labor and viligent attention. We know that it cannot be successfully done without these. But it is not labor lost. No cultivation, within our observation, better repays for the labor and incidental expenses. We have known, the present season, acres that have yielded their owners a net income of more than *two hundred dollars*; and we know that a man with two boys can well attend to half a dozen acres of such cultivation. Surely, when as at present, there is no limit to the demand for the article, and a ready cash market, those who have *acres* and are willing to labor, need not be in want of a fair compensation for their labor.

As samples of the present year's produce in the town of Danvers, we state the following that have come under our notice:

Names.	Acres.	Produce.
John Peaslee,	3	1,980 bushels.
Daniel Osborn & Son,	1 1-5	870 "
James P. King,	1 1-3	660 "
Aaron C. Proctor,	1 1-4	600 "
E. & D. Buxton,	6 1-2	2,750 "
Henry Bushby,	4	2,000 "
Joseph Bushby,	3	1,500 "

Yielding an average of more than 500 bushels to the acre.—*Cultivator.*

A SKETCH OF SYSTEMATIC AGRICULTURE.

(From Thaer's Agricultural Works.)

Agriculture is the art of deriving from the earth the most valuable organic productions. He who exercises this art seeks to obtain profit by causing to grow, and by using, its animal and vegetable productions. The more considerable the gain derived, therefore, the better is the object accomplished. The most perfect agriculture is, evidently, that which produces by the application of labour, the largest and the most permanent profit in comparison with the means employed. Systematic Agriculture ought, then, to teach us all the circumstances by means of which we may derive the most considerable profit by the practice of the art. Now, there are three methods of teaching or learning the practice of Agriculture.

1. As an occupation by the manual exercise of it. 2. As an art. 3. As a science.

The skilful practice of Agriculture, as an occupation, is limited to the imitation of certain operations, and the observation of events and circumstances. It is nothing more, when thus pursued, than a simple mechanical art, for the practical farmer can only imitate and repeat the ordinary operations of Agriculture, occasionally modified by times and circumstances, and often, perhaps, without considering or ever knowing the motives by which he is governed.

The art of Agriculture is the realization of some ideal object. He who practices it has received from others, without considering the reasons on which it is founded, the idea or rule by which he proceeds. The skilful practice of an art consists, therefore, in the adoption of new ideas, in the study of new rules, and in judging the fitness of their being carried into practice. The science of Agriculture does not lay down any positive rules, but it developes the motives by which the best possible method of proceeding may be discovered and successfully pursued. In fact, the act executes some law given and received, but it is from science that law emanates.

Science alone can be of universal utility, embrace the whole extent of a subject, and enable us to derive the best execution of it under every possible circumstance. Every positive direction is applicable only to some determinate case, and each case requires a special rule which science alone can supply. That system of Agriculture can alone be called the most perfect which is the most reasonable—for these are synonymous terms.

The manual exercise and study of the art can never be useless to the Agriculturist who wishes to elevate it to the rank of a science, and to the mental consideration of which it is deserving. It will be advantageous to him to have the experience, the labour, and the energy which are necessary, in order that he may judge of the mechanical execution of the various portions of it.

A purely practical Agriculturist is compelled to follow the rule which has been laid down for him, although it may not be wholly applicable to the particular case which presents itself. He cannot depart from it without adopting some other rule which may, perhaps, deviate entirely from the first.

This is the reason that so many Agriculturists, who have practised with success in other countries, and under other circumstances, on being removed elsewhere, have committed very deplorable blunders.

Thus, the man who has not studied the science of Agriculture, can make little use of books, or even the best of them; he knows not how to arrange the new ideas which they unfold, and he cannot follow them in their fullest extent. All that he dares to do is to read these books which have the closest relation with the circumstances in which he is placed.

Experiments.—We can experiment either by means of simple *observation*, by examining the subjects and agents placed in relation with each other, and by considering their reciprocal action, and observing its results, or by means of *trials* or experiments, by placing some well known plant in certain situations, determined with precision, observing their reciprocal action, and preventing, as much as we possibly can, any foreign or unknown body from influencing the results of our experiment.

A trial is a question addressed to nature; when such a question is properly put, nature will necessarily reply either yes or no.

It is only within the last century that the art of making experiments has been clearly apprehended It is on this art that the principal power of man over the material world is founded, and that power will become more extended in proportion as he brings this art nearer to perfection and carries it into full practice. * * *

There is a particular kind of Agricultural experiments which have arrived almost at perfection, and which can be regulated with a degree of precision equal to that which is attained in the other practical sciences—these are comparative trials in the open air.

It is true that experiments of this kind are not easily made; but, nevertheless, they are in the power of every reflecting Agriculturist. Whoever has accomplished one experiment, whatever may be the peculiarity of the circumstances under which it was made, and has given a faithful account of it, has well contributed to the advancement of science, and consequently to useful practice, and has entitled himself to the gratitude of his cotemporaries and of posterity. It would surpass the power of any single individual to accomplish any considerable number of these experiments, and could not be expected from him. It is the duty of the Government to place some well educated men in a position to employ their time and talents in investigating the secrets of nature for the advancement of Agriculture and the general good. Agricultural Societies, which are instituted for the advancement of science, should especially engage in the preparation of such experiments, and divide the execution of them among the several members. * * *

Science would have made much greater progress if the false shame with which Agriculturists conceal every unsuccessful experiment, and the exaggerated manner in which they often relate all those in which they have succeeded, had not retarded its progress.

Note.—We believe that the exaggerated reports of experiments that are often published is most injurious to the progress of Agricultural improvement. Plain practical farmers, who read such reports, lose all confidence in what they properly call book farming We have seen, in respectable Agricultural papers, reports that cannot be credited by any farmer who understands the practice of Agriculture and its results. Were it possible even that some of these reports were correct in particular cases, and under extraordinary circumstances, what is the use of publishing them in an Agricultural Journal, if the experiment cannot be successfully adopted by others, or continually practiced by those even who report them? It is worse than useless to publish any experiments in Agriculture that cannot be pointed out as an example for other farmers' practice or instruction.—[Editor Agricultural Journal.]

"It is evident that Agriculture ought to borrow from every science the principles which she employs as the foundation of her own, and although the sciences do not form an indispensable part of the farmer's education, he ought, nevertheless, to have a general knowledge of them.

"It is impossible that an enterprize like that of Agriculture can be exempt from casualities and accidents; a certain tranquillity of mind must be united with the necessary activity in order to secure a happy life Whether this be attained by the consolations of philosophy or religion, the Agriculturist must learn to support this misfortune with resignation; he must forget all the evils which it was impossible for him to foresee, all those hopes which have ended in disappointment, so soon as he has, by the adoption of prudent regulation, deminished, as much as possible, their annoying consequences.

"Rural life, in despite of the pleasures that attend it, has so much uniformity about it, and, with all its occupations, has so many hours for idleness, that it scarcely satisfies an active mind that possesses no other object of employment. In choosing an accessory study, the accomplished Agriculturist will not find any one that will be more consonant with his feelings than Natural History. He, better than any other person, can abandon himself to the consiousness of living in the bosom of nature, and investigate her sublime laws; and so far from interrupting his usual occupations by this pursuit, he will almost always be able pleasingly to unite them.

"In the moral world, and the relations of society too often present us only with the painful spectacle of a resistance to the laws of reason which spreads grief and misery over the earth. Nature, on the contrary, unfolds to us more striking proofs of order and unity in proportion as we penetrate into her mysteries. The beauties

which we discover, not only gratify our tastes but th y also afford us a demonstration that the Eternal Wisdom who unfolds to our view His operations in the material world—who is ever reproducing matter under new and admirable forms—will also, in the moral, pursue an equally harmonious plan, the full confidence of which is reserved for the ages of Eternity. This feeling, although vague, is far more vivid in the inhabitant of the country, than in the person who passes his time in populous towns. It is on this account that more true religion is generally found among Agricultural people, than among those devoted to war or to commerce.

(To be continued.)

Agricultural School for the Counties of Berks, Bucks, and Oxon.—A numerous and highly influential meeting of the leading gentry of the diocese of Oxford was held last week at the Bishop's residence, Cuddesden Palace. The Lord Bishop of Oxford, Viscount Barrington, M. P.; J. W. Henley, Esq., M. P.; J. H. Langston, Esq., M. P.; P. Pusey, Esq., M. P.; R. Palmer, Esq., M. P.; C. G. Dupré, Esq., M. P.; J. Walter, Esq., M. P.; Messrs. C. Carrington, junr., C. Mount, C. Eyre, H. Hamersley, W. H. Stone, and C. Tower, Esqrs.; the Venerable Archdeacon of the Diocese, the Revs. C. K. Keene, H. W. Majendie, W. R. Freemantle, J. E. A Leigh, E. Hobhouse, &c., were present; when it was resolved to establish a school in connection with the Oxford Diocesan Board, for the purpose of offering a sound English education to the sons of farmers and others. The number of boys to be limited to 150, who are to be admitted upon an annual payment of £25. The right of nomination to be vested for life in the contributors to its funds. A Committee of noblemen and gentlemen, under the Presidency of the Bishop of the Diocese, has been framed for the purpose of collecting donations, and carrying into effect the objects of the meeting. Upwards of £1,100 has already been subscribed.

Chinese Agriculture.—If there be one thing that the genius of this extraordinary people has brought nearer to perfection than another, it is the cultivation of the soil. The economy of their agriculture is beautiful; the whole country presents the appearance of one continued garden: no large commons starving a few miserable horses, nor parks and chases laid waste for the special purpose of breeding rabbits, are to be met with: the land is meant to feed and clothe the people, and to that use its powers are directed. Not an inch of soil is lost that can be made useful by the most laborious and apparently unpromising industry, save only such parts as are set aside for burial-grounds. Swamps are drained by canals, which carry the superfluous waters where they are turned to profitable account in enriching land that otherwise would not be productive. Hills are terraced to the summits, and the banks of rivers and shores of the sea recede and leave flourishing farms to reward the enterprise of man. I know nothing that would be likely to be more valuable to this country than the report of an experienced and scientific farmer, could such be induced to bestow a short time in travelling to China and making its agriculture his study.—*Faber's China.*

Artificial Desiccation.—Mr. Webster called the attention of the Council to a new system of drying animal and vegetable substances by means of rapid currents of hot air passed through chambers in which such substances were enclosed, which he conceived would prove, in many instances, of great advantage in reference to agricultural produce. He exhibited specimens of various kinds of wood exposed in a green state to the influence of hot air in this process, and which, in one week, had become perfectly hard, dry, and solid, having lost a considerable amount of weight by the abstraction of moisture and being left in a state only slightly susceptible of re-absorbing it. The articles to be dried were exposed to the currents of hot air (varying from 100 to 450 degrees Fahrenheit) in a brick chamber ten feet wide, fifteen feet deep, and twenty feet long, erected at an expense of from £160 to £200. Mr. Webster was engaged in experiments on the application of this process to agricultural purposes and would report to the Council the result. In the mean time it had been advantageously applied to wood of all kinds, to tiles and bricks (and even to meat), to turnips, mangold-wurzel, carrots and parsnips; to mouldy hay (which it rendered perfectly dry and sweet), and mouldy or mildewed wheat; as well as to damp and tainted feathers and linen.

Imports and Exports.—An account was yesterday printed (obtained by Mr. Wyld), in a parliamentary paper, of the official and declared value of the imports and exports of the United Kingdom for 41 years, ending with the year 1846. The imports calculated on the official rates of valuation were in the last six years (1841 to 1846, inclusive) as follows:—£64,444,268, £65,253,286, £70,214,912, £75,449,374, £85,281,958, and in 1846, £75,953,804. The total exports in the same period were—£116,902,887, £113,841,802, £131,832, 947, £145,956,654, £150,877,902, and in 1846 £148, 584,607. The declared value of the produce and manufacture of the United Kingdom exported in the six years, was—1841, £41,-634,623; 1842, £47,381,023; 1843, £52,279,709; 1844, £58,584,292; 1843, £60,111,082; and in 1846, £57,785,876.

THE NITRE LAKES OF EGYPT.—In the midst of this sandy waste, where uniformity is rarely interrupted by grass or shrubs, there are extensive districts where nitre springs from the earth like crystallised fruits. One thinks he sees a wild overgrown with moss, weeds, and shrubs, thickly covered with hoar frost. And to imagine this wintry scene beneath the fervent heat of an Egyptian sun, will give some idea of the strangeness of its aspect. The existence of this nitre upon the sandy surface is caused by the evaporation of the lakes. According to the quantity of nitre left behind by the lake do these fantastic shapes assume either a dazzling white colour, or are more or less tinted with the sober hue of the sand. The nitre lakes themselves, six in number, situated in a spacious valley, between two rows of low sandhills, presented—at least the three which we visited—a pleasing contrast, in their dark blue and red colours, to the dull hues of the sand. The nitre which forms a thick crystallised crust, upon these shallow lakes is broken off in large square plates, which are either of a dirty white, or of a flesh colour, or of a deep dark red. The Fellahs employed upon this labour stand quite naked in the water, furnished with iron rods. The part which is removed being speedily renewed, the riches of its produce are inexhaustible. It is hence that nearly the whole of Europe is exclusively supplied with nitre, and this has been the case for ages; for Sicard mentions, at the commencement of the last century, that then 36,000 cwts. of nitre were broken annually for the grand signior, to whom it yielded 36 purses. By the side of one of the lakes, piled in large layers, was heaped the produce of the last week's labours. My companion had occasion to find fault with the result of the work of one of the villagers—the sheikh of the village stood before us—he sharply rebuked him, and to give greater effect to his words he crossed his naked shoulders two or three times with his whip of elephant's skin. The sheikh sprang as nimbly as a gazelle into the lake, and received his further instructions beyond arm's length. Such was the impressive discipline which even the Italian, who was a man of gentle manners, considered it necessary to adopt towards these Fellahs. The plates of nitre, after undergoing a preliminary cleansing upon the banks of the lake, are carried to the castle, where by various processes, they become a dazzling white powder, and in this state it is carried in large quantities to Teranneh.—*Tischendorf's Travels.*

BRISKET OF BEEF—À LA GARRICK.—This dish will, I am sure, be as popular with the English public as the celebrated tragedian and comedian whose name I have borrowed, even if he were now alive. Procure a nice brisket of beef with as little fat as possible attached; if too much cut a little off, and detach the whole of the bones from it. Then make a pickle with 20lb. of salt, ¾lb. of saltpetre, 4 cakes sal prunella, 2lb. of moist sugar, 2 cloves of garlick, with which rub the meat well, and leave it rather more than a week, rubbing and turning it every day; then drain and cut it into equal parts, placing one upon the other, mixing the fat and lean well; tie them together, and afterwards, in a clean cloth, put into a large strew-pan or stock-pot containing six gallons of water, and let simmer for eight hours. But, to ascertain correctly if done run a trussing-needle into it, and if tender it is quite done. Then take it out, and let it remain ten minutes upon a dish to drain; have ready a large tin-dish cover 18 inches long, 12 wide, and deep in proportion. Place it upon a trivet, and put the beef into it, opening the cloth to lie smoothly in the cover, and with a fork arranging the meat, fat and lean together, all over the bottom. You have a common piece of board, half an inch in thickness, made to fit into the cover, place it upon the meat with a half hundred weight upon it, and let it remain in a cold place until next morning. Then take off the weight and the board, pull the cloth gently at each angle, and when loose turn it over upon your dish. Take the cloth off gently. Garnish with sprigs of parsley, fresh-water cresses, and small radishes (if in season), cut in thin stripes crosswise. Nothing can be nicer than this for a breakfast or luncheon. It will keep a fortnight in winter; and as long as a week in the summer by putting it in a cold place. I have frequently made some in my kitchen at home, procuring a piece weighing 10 or 12 lbs.; from the bones and trimmings of which I have also made very excellent soup, which last of course must be fresh. The pickling will answer to salt three or four other joints, as it will keep good nearly a month in summer, and much longer in winter.—*M. Soyer's Kitchen at Home.*

HOW TO CATCH PIGEONS.—A boy in Perth who had lost a favourite pigeon by its abscon-

ing from his dove-cote, happened to observe it with some others upon the street. He immediately got hold of a pretty sizeable stone about which he fastened the end of a piece of small cord, three yards long, and to the other end a common horse-bean. He went as near to the pigeons as he could with his apparatus without making them fly off, laid it down on the street, and scattering some mouldy crumbs of bread around the bean, retired. The pigeons were immediately at the crumbs, and one of them, and it happened to be the boy's, observing the bean, made a gobble at it and swallowed it. The boy made a rush; his favourite essayed to fly, but he was as safe as a trout on a hook. The bean though down, would not come up, and not being able to carry off the stone, the prisoner was soon secured by the boy, who cut the cord close to the bill, and carried him off in triumph.

Economy of Vegetable Diet. — Dr. Lyon Playfair has recognised the economy of vegetarianism. At the late agricultural meeting at Drayton Manor, he said:—"At London prices, a man can lay a pound of flesh on his body with milk at 3s.; with turnips at 2s. 9d.; with potatoes, carrots, and butchers's meat, free from bone and fat, at 2s.: with oatmeal at 1s. 10d; with bread, flour, and barleymeal, at 1s.2d.; and with beans less than 6d. These considerations are far from trivial, because when we consider that an equal amount of nutritious matter can be obtained from one food at less than one-fourth the cost of another, this is only saying that in time of distress, with an intelligent application of money, we can feed four people where formerly we could only feed one."

The Advantage of Science.—To "A Farmer of the Good Old School."—No reflecting person can long despise science as being the mere speculation of theorists; it must soon be considered by every class of men in its true point of view—as the refinement of common sense, guided by experience, gradually substituting sound and rational principles for vulgar prejudices. Industry is never so efficacious as when directed by science: it is like to a person journeying in the night, who, however full may have been the directions for his way, feels more certain of his path if he carry a lamp to guide him through the darkness.

Irrigation.—To "A Hampshire Improver."—We cannot do better, in reply to your why and your wherefore, than give an extract from a little work called "Productive Farming," by J. A. Smith, wherein he remarks: "If river water contains gypsum (sulphate of lime), which it certainly does if the water is hard, it must, under ordinary circumstances, on this account alone be highly fertilizing to meadows since the grasses contain this salt in very sensible proportions. Calculating that one part of sulphate of lime is contained in every two thousand parts of the river water, and that every square yard of dry meadow-soil absorbs only eight gallons of water, then it will be found that by every flooding more than *one hundred weight and a-half of gypsum per acre* is diffused through the soil in the water; a quantity equal to that generally adopted by those who spread gypsum on their clover, lucern, and sainfoin crops, as a manure, either in a state of powder or as it exists in peat-ashes. And if we apply the same calculation to the organic substances ever more or less contained in flood-waters, and if we allow only twenty-five parts of animal and vegetable remains to be present in a thousand parts of river-water, then we shall find, taking the same data that every soaking with such water, will add to the meadow nearly two tons per acre animal and vegetable matters; which allowing in the case of water-meadows five floodings per annum, is equal to a yearly application of ten tons of organic matter. The quantity of foreign substances present in river-water, although commonly less, yet very often exceeds the proportion we have calculated to exist."

Bishop's Tawton.—*Ploughing at midnight!* —Not many weeks ago a farmer of this parish purchased one of Comin's improved ploughs, which his ploughman, the day after it was brought into the farm yard, was anxious to try, but the weather was wet, and the ground not in order, so the farmer forbade it, and Giles proceeded to another job. Night came, and he went to bed, but such was his anxiety to "try the *zoul*" that he dreamt of nothing else, and after a short nap got up before midnight, harnessed his team to the plough, hastened to the field, took advantage of the moonlight, ploughed three quarters of an acre, and returned home to the farm house long before the rest of the family were out of roost: The farmer got up at the accustomed hour, and called his man, but he answered not: on getting down stairs, he was surprised to see Giles seated comfortably before the fire, and told him that he had better go and look after his horses, but re-

ceived for answer that "it was done already." "Then," said the farmer you may go to plough." "Been already, master," said Giles, "Already!" said the farmer, "what does the fellow mean?" "Aye," rejoined Giles; "could'ntrest, measter; must go and try the *zoul*, and a rare good one it is; and if you'll go to the field, you'll find the day's work all done!" And so in truth he found it, and done in first rate style, although it was a nocturnal job.—*North Devon Journal.*

SONG.

I'LL FARM LIKE MY FATHERS BEFORE ME.

[FROM THE DUMFRIES AND GALLOWAY COURIER.]

When my landlord says, "John,
You must really get on,
Just see how your neighbours are striving;
We must be improving,
And onward keep moving:
Depend, that's the right road to thriving."
"Sir, I pay when I can;
I'm a hard-working man;
At elections you know you get o'er me;
Let them do as they may,
I prefer the old way,—
I'll farm like my fathers before me.

"There is Berwickshire Dick—
Of the fellow I'm sick—
They say that his crops are so charming;
And there's East Lothian Will,
He is worse and worse still;
They boast,—*how* they boast of his farming!
Every thing is so good,
And so well understood;
It's all just to chase and to bore me:
But I care not a jot,
For I value them not,—
I'll farm like my fathers before me.

"There's nothing but toiling
At draining, subsoiling,
And grubbing old hedgerows and fences;
It is all very neat,
When the thing is complete,
But dreadful to think what expenses!
Should I spend on the land,
I cannot understand
How cash it again would restore me:
I shall therefore take care
Aught that I get to spare,
I'll keep like my fathers before me.

"To the market they ride,
In the flush of their pride,
As if they were pinks of creation;
On the best they will dine,
And sit over their wine,
And talk about crops and rotation;
But how they do contrive
To get RICH,—man alive!
That certainly RATHER *gets o'er me*!
But I care not a jot,
For I envy them not,—
I'll farm like my fathers before me.

"There's such newfangled ways
About dung now-a-days,
Whole islands have gone to destruction;
It's absurd to suppose
That so tiny a dose
Can greatly increase the production.
About liquid manure
I am not quite so sure;
But *trouble* and *tanks*, I abhor ye!
'Twas my old father's song—
'Jack, thou'lt never do wrong
To farm like thy fathers before thee.'

"Improvements in breeding;
And new modes of feeding;
'Bout science they'll preach you a sermon;
They may boast of Liebig,
But I care not a fig,
He's nought but some cunning old German.
They talk about gases
Like thundering asses,
Such nonsense shall never get o'er me;
I have just this to say—
I prefer the old way,
I'll farm like my fathers before me."

JOHN PALMER.

Annan, Nov. 1, 1847.

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