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AGRICULTURAL JOURNAL,

AND

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OF THE

Lower Canada Agricultural Society.

VOL. 2.

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NO. 4.

We give insertion to a "lecture" by Mr. Nesbit, delivered at Saxmudham, Suffolk, England, which we recommend to the attention of Agriculturists, as containing much that will be useful for them to know. We perfectly agree with Mr. Nesbit that many who fancy themselves practical farmers are very far from having a perfect knowledge of agriculture in all its various branches. This perfect knowledge in this first of all arts is more difficult to acquire than most people imagine, and is only possible by an extensive experience for many years in every branch of husbandry. We are perfectly aware that the present state of Canadian agriculture does not afford this extensive experience in every branch of husbandry, and consequently we have no opportunity here of learning to become practical farmers in the full meaning of the term. The breeding of domestic animals—their keeping and feeding—their purchase and sale—the management of manure and its judicious application—the draining and cultivation of the soil and every variety of crop—hoeing—weeding—harvesting, &c., until finally disposed of—the skillful employment of labour—the management of the dairy and its products;—all these must be seen in active and successful operation in order to be understood perfectly, and it is only in the British Isles that extensive and well-conducted farming establishments can be seen—and there alone can a farmer acquire a perfect knowledge of the practice of agriculture. Our agriculture in this country is generally conducted upon a very different, and we conceive, an inferior

system in every respect to that of well-managed farms in the British Isles, and therefore perfection in the art of agriculture is not to be learned in this country until our system is very much changed for the better. We do not wish to give offence by saying this, but as Editor of this Journal we feel it our duty to endeavour to point out what a practical agriculturist should be, or how he may become one. There are doubtless very many farms managed well here according to the system of the country, but we should be glad to see extensive farming establishments managed here in every department as in the British Isles, so far as our climate would admit. A regular rotation of crops, meadow and good pasture in due proportion to the arable land, and such pastures as would fatten animals in perfection or yield a good dairy produce; hoeing and weeding and all other works of the farm executed expertly by men and boys who understood their business. We take leave to say that it is only at establishments such as we have described that a man can have any pretensions to have learned a perfect system of practical agriculture in all its various branches, and we leave it to those who may know, to say where this system is to be learned in this country. It is from this cause that the establishment of agricultural schools and model farms is so desirable and necessary in Canada to instruct young farmers properly in every branch of husbandry. We shall never see our agriculture much improved while we look upon it as a mean, simple art, easy to learn and practice, even by men of the

most moderate natural capacity, and with or without any education. Indeed we believe it is a very general opinion that agriculture is only the suitable employment for those who are unfit for any other, and the consequence is that agriculture is deprived of all the best educated and most talented portion of the community, and this immense advantage goes to the assistance of other businesses and professions, to the great detriment of agriculture. This is a most unfortunate error, and the sooner it is understood to be so the better it will be for the country. How different is our estimate of agriculture! We conceive it to be the most noble of employments, and as far above any other practised by mankind, as those who regard it with little favour think it below other professions and employments. We also think it the most suitable employment for the best educated and highest order of natural intellect, where alone they could find full and useful exercise for all their powers throughout the longest life allotted to man, and where to the latest hour of life, however long, they may be discovering something new and useful in the science and art of agriculture. All other professions and trades are little more than mechanical arts, that may be learned with certainty in a given time. Not so with agriculture; the whole life of man may be employed in learning the art in perfection and still leave something to be learned by his successors. We deny that it is only those who work constantly themselves that can be good practical farmers, such an opinion is most erroneous. It is undoubtedly very necessary that the master of a farming establishment should know how every work upon the farm should be executed, and what the expenditure of labour should be upon each work, but all this may be learned by early and proper instruction. A man who has some leisure to think is more like to become, under competent instruction, a practical agriculturist, than he who has to work constantly. Our own conviction is, that so far from agriculture being a simple and easy art to learn in all its various

branches, it is the most difficult of all arts and professions to understand perfectly, and if education and talents are of any benefit they must certainly be very useful to us in learning any art or science that is difficult. There are other circumstances connected with the profession of agriculture which we have been surprised did not attract more men of education and talent to this occupation in Canada. No other employment affords such varied and delightful enjoyments as the study and practice of agriculture, an enjoyment that should not be valued by pounds shillings and pence when comparing the profits of agriculture with those derived from other employments. The husbandman has also encouragement offered him that scarcely any other employment affords, and that is, that when he performs his part well he may rely upon a bountiful Creator to bless his labours with a plentiful harvest, and his reasonable expectations are seldom disappointed. Take agriculture in every way it can be considered, it is the only employment that can be practiced without discredit by Emperors, Kings and Princes, as well as by every rank of their subjects, from the highest to the lowest, and therefore it is a study that is well worthy the most gifted in intellect, in education and in wealth; and we do not hesitate to say, that a practical agriculturist in the full meaning of the term may be the most useful member of this or any other community, no matter how highly other classes or professions may estimate themselves. Agriculture is the basis of wealth, and wealth could not have any existence except from the accumulations of the surplus products of agriculture over what is consumed by those employed in husbandry. As this is a fact capable of demonstration it may have some influence in raising agriculture in public estimation, as wealth is the idol universally worshipped in every country.

Mr NESBIT spoke as follows: Mr. Chairman and gentlemen, I feel very highly gratified at seeing such a numerous assemblage of gentlemen interested in the progress of agriculture; and I shall feel very great satisfaction this eve-

ning, in endeavouring, as far as I possibly can, to elucidate the science of agriculture with reference to the application of chemistry to its development. I am not come down to you with a vast amount of chemical apparatus; I have not brought here a prodigious number of curious things of which you might have wondered what was the use. I come to you this evening with the language of plain common sense; and with the operations which you are continually performing on your farms as the basis of my arguments, I shall see if I cannot, by applying to them the rules of plain common sense, elucidate the subject, and secure to you a greater knowledge of the science of agriculture than you already possess. Before doing this, however, I must make one or two observations. And gentlemen, I must, in fact, quarrel with you, because you arrogate to yourselves alone, what I think you ought not to claim for yourselves, alone—the title of *practical men*. “We, we, we,” you say, “are the practical men,” as if there were no other practical men in the kingdom besides yourselves, and as if no one else understood the nature of things. Now, I mean to contend that the title “practical,” does not belong to the farmer alone; and I have certainly some doubt whether it ought to be applied to the farmer at all, in its full signification. I will take, for example, the case of Mr. Tomkins, who is a capital farmer. He farms his land well; he keeps stock, and grows turnips, and does everything in the best manner. Now, as a poor student in science, I want to gain from this gentlemen some useful practical information. With this object in view, I say to Mr. Tomkins. “Pray, what have you got in your soil—what are its properties?” He replies that it is a sandy soil, a loamy soil, or a clay soil. “Yes; but what have you got in the one and what in the other?” “I don’t know; I have not gone so far as that yet.” I then ask, “What have you got in your manure?” and Mr. Tomkins, good, easy, practical man as he is, says, “I cannot tell you.” If I ask him what his crops take out of the land, again he declares that he cannot answer my question; he knows that they take away something; he knows that if he sows wheat, barley, or anything else, something is he cannot determine. Lastly, if I ask Mr. Tomkins what is in the air and what in the water, he is still obliged to confess that he does not know. Now, gentlemen, I appeal to you whether the term practical, in its largest sense, will apply to Mr. Tomkins, while he actually knows nothing whatever of those things on which the success of the agriculturist, peculiarly depends. I grant you that Mr. Tomkins looks at his crops, manures, and soils, in the whole, and that he has got some general idea of them as a whole; but then he never seriously considers what this whole is composed of; and what I propose to do is to extend his knowledge

a little further; so that, instead of his attention being confined to those generalities on which it has hitherto been fixed, he should be made acquainted with everything in the soil, in the crops, in the manure, in the air, and in the water (Hear, hear). Now, I ask you, gentlemen, as practical men, to say whether you consider that this knowledge would not be worth having, and whether it would not be well for every man, as far as it may be in his power, to seek to attain such knowledge. Well, now, having thus prefaced my subject, I shall at once commence the consideration of the manure made on the land; and I shall afterwards offer a few observations on the rotation of crops and the nature of those substances which are offered to the farmer under the name of artificial manure. And let me here observe that I shall be very happy, at the close of the lecture, to hear any remarks, or to answer any questions which may occur to any one present, having reference to anything which I may have said; for some of the things which I intend to present to your notice may be so new, and so contrary to ideas previously impressed on your minds, that you may doubt the truth of my statements; and the best way to settle any question of that kind is to argue the point at the close of the lecture (Hear, hear). Let us begin with the far-famed farm-yard dung, which is supposed to be so superior to all other things. It is that which grows the crops, and, which, in the estimation of the farmer, is not surpassed by any possible combination of substances. Now, what is this farm-yard dung? It is formed by acting on vegetable matter in some way or other. You either take a quantity of vegetable matter, and pass it through the stomachs of animals, where it is acted upon and the refuse passed out, or you put vegetable matter—as straw, or litter—in the yards, and allow the excrements of animals to be mingled with it, and a slow decomposition to take place. The whole being commingled and mixed together is known by the name of farm-yard dung. Now a very little consideration will show that the whole of the material which is found by you, gentlemen, to be practically so useful on the farm is merely derived from vegetables; so that you are, in fact, applying the remains and refuse of vegetables to renovate the land. This is the whole secret of a farm-yard dung; it is vegetable matter, which, when partially decomposed, is re-applied to the land, where it forms vegetables over again; so that you are continually working as it were in a circle. Thus the same particles of matter imported on the farm perhaps in the shape of oil-cake, first reappear in the shape of a turnip, again as barley, now as beet-root, now as wheat—the cycle of changes continues until the identical particles are exported from the land as beef or mutton, or as grain. Now I hope I shall be able to offer one or two ideas with respect to the origin and nature of

that which is so constantly under our notice. Some gentlemen have got an idea that animals have a mysterious power—of what nature it is impossible to say, but they imagine that it really exists—a mysterious power, by means of which they can change a turnip, or a quantity of oats or greens, into a superior manure for land; and that food must have passed through the animal before it can be really useful on the land. That is the idea entertained on this subject by ninety-five farmers out of a hundred. I must proceed this evening to disabuse your mind of that erroneous notion; I must inform you that the manure obtained from animals is always dependant, as regards its value, on the food, which the animal eats; and that the excrements of animals are always less valuable, and less powerful in manuring principles, than is the food consumed by those animals whilst producing the manure; that green food, ploughed into the land, will give more manure to the land than the food eaten by animals. Not that I would recommend you, as a rule, to plough in your vegetables; but I wish you to remember that your sheep can deposit nothing on the land but what they have first received from the food; and that, under all circumstances, the amount deposited will be less than that received. Now let us look a little at this point. You know that in one of our ordinary fire-places, when coals are put in the grate and a light is applied to them, an action takes place which makes the air above differ from that below the fire; without any mention of the name of a single chemical element, you have only to apply your plain common-sense in order to be aware that an action takes place between the air and the coals, producing heat, and that the air above the coals (in the chimney) is very different from the air below the coals, which enters at the grate. Now you give an animal a certain amount of food; that food is taken into the system; the constant action of the lungs, which inspire and expire the air, has the effect of bringing into the system a large amount of air. This air acts upon the food which is taken into the system. By the combustion or burning of a certain amount of that food animal heat is produced, which keeps up the temperature of the animals, so that they get a higher temperature than the surrounding atmosphere. The expired air contains the result of that combustion, and resembles in composition the air of the chimney; another portion of food not used for producing animal heat is laid upon the bones, forming muscle, or fat; and what the bullock itself has no use for, is cast out of the system. Now, you observe at once that the animal, by acting in this way on the food, actually deprives it of certain constituents, and at the same time makes it less in amount; so that, in fact, the only real action is one which takes away certain portions of the food and renders the others more quickly soluble. All the

soluble parts of the food are passed out in the urine, and all the insoluble parts in the excrements. There is a regular process performed in the laboratory of the stomach, the effect of which is what I have thus described. Now, the same thing takes place in the decomposition of vegetable matter. You lay down a large quantity of straw, and you let the water fall upon it, as well as the excrements of animals. You all know what takes place. The heap gradually heats, and this gradual heating is nothing more than the effect of the gradual action of the air upon it. Certain portions of the vegetable matter thus acted upon by the air are consumed and taken away, and the bulk becomes less; so that, even in the process of acting on vegetable matter, you lose a portion, and it goes off into the air, just in the same way as the solid parts of coals pass into the air by means of the chimney. You all know that the solid parts of coal disappear and leaves nothing but ash behind. The two cases are, in fact, identical. I may refer you to the case of a hay rick put up in too damp a state. In that instance, an immediate action takes place from the contact of the air with the moist hay, and that action continues increasing, until, at last, the whole bursts into a flame. Now, gentlemen, in either case, in the making of manure there is a diminution and a loss. You must have seen the reek going off from the dung-heap, and there are other circumstances which also disappear in the air which you cannot see. If what I have stated be true, you will draw the conclusion for yourselves, that vegetables ploughed at once into the land, furnish a greater amount of the substances adapted for the vegetation of plants than they would supply if passed through the stomachs of animals—that is to say, to give a plain, practical illustration of my meaning, if you chop up an acre of turnips, making them sufficiently small for decomposition, and plough that acre of turnips into the land, you will have more manure in the soil than if you fed a flock of sheep upon it, without the addition of oil-cake or any other extraneous manure. Again, take other green crops, such as rape, and plough them in, and you will have a larger amount of substances calculated to bring forth the next crop than if you passed that acre of rape through the bodies of animals. You may call this theory, gentlemen; but it is absolute fact; there is no theory about it. It has been tested by practical men, and I will give you one or two instances. A gentleman heard me make this statement when I was lecturing at Maidenhead—and let me remark that the gentlemen who composed my audience on that occasion were not quite so decorous as you gentlemen have shown yourselves this evening; for I heard some of them call what I said “gammon” (laughter). Now, notwithstanding its being “gammon” a certain gentleman determined to try whether or not the

case was as I had represented. A gentleman named Mr. W. Trumber, of Dorney, near Windsor, having 20 acres of rape, ploughed in one or two acres in different parts of the field. The rest was fed off by sheep. These sheep were luxuriating every day on a beautiful meadow, adjoining, and were folded at night on the rape. I was invited last Midsummer but one to see the effect of this experiment; and about a dozen practical men were invited to meet me upon the occasion. The land was gone over, and I could point out every place where the rape had been ploughed in. The wheat stood eight or ten inches higher than the rest; and in the judgment of these practical men there was more than a quarter of an acre difference between the places where the vegetables had been ploughed in and the places where the sheep had been fed off. More than that, I happened to meet Mr. Trumber at the annual dinner of the Reading Farmers' Club, when he told me the turnip crop succeeding was much better, and he fully expected to see it in the barley.

To pursue the subject of this manure a little further, you see at once that the manure will vary as the food varies. If you use straw, or oil-cake, or turnips, the quality of the manure will vary accordingly, as the composition of these substances varies; and it will vary because the animal takes away only a certain proportion from each of these, and casts out the remainder as excrements. But the nature will vary, not only as food varies, but according to the age of the stock. It is plain and palpable that the beasts which are already pretty nearly fattened will take far less out of the food eaten than lean, young, and growing stock, because the young stock, having to form their bones and flesh every day, rob the food which they feed upon of a much larger quantity of valuable and nutritious matter than such as have nearly attained the fatted state. Not only does the quality of manure vary according to the food and the age, but the dung of milch cows is inferior to the dung of bullocks fed on the same amount of food. It is plain that if a cow is giving milk to young animals, the manure is robbed of some of its most valuable properties. If a chemist analyses milk, he finds it to contain some of the most important ingredients of manure; and of course, therefore, these ingredients are lost to the excrements. It is very clear that the value of manure will vary according to the kind of food, age of the stock, the nature of the stock, whether the stock gives milk or not, and whether it consists of sheep or oxen. The seeds of plants contain the largest amount of nutritive matter; for as the purpose of the life of a plant is to reproduce its kind, we find that every other part of a plant is exhausted to produce the seed which shall give birth to another generation. When, therefore, seeds

—as barley, oats, or oil-cake—are given to cattle, the animals will not only find more nutriment than in hay or straw, but the manure will likewise be much better. Now, having thus spoken of the origin of manure, and having, I think, clearly proved to you that it is all produced from vegetables, and that animals have no power whatever to add one single atom to the vegetable matter received into their system, and that they deposit it in the land than they receive in the shape of food, let me next proceed to speak of the methods of manufacturing manure. And, gentlemen, you often mix your dung in a manner which I must say shows a great want of *practical knowledge*. I have seen manure placed in a position where all the waters from the outbuildings poured down upon it, and washed the soluble matter away into a neighbouring pond, there to poison the horses. I have gone amongst heaps of dung which were steaming away at a fearful rate, and my nostrils have instantly informed me of the escape of a substance which has a very high price in the market, yet the practical men appeared to be quite unaware that he was losing one of the most valuable ingredients of manure, namely, ammonia; he did not appear to imagine that he had any means whatever of helping himself. Now I wish you to point out how pleasant it would be to the pocket to have a little more knowledge on this subject; it is the pocket after all which suffers most. You may term me theoretical, if you please; but I must say that I think there are as many *crude theories* among the so-called practical men as ever emanated from the brains of all the scientific men of the world combined. Now let us look at this manure. When the chemist comes to examine it, he finds that there are certain ingredients in manure, which are naturally volatile, or which become volatile in the process of fermentation, and which, if acted upon by water, are carried away; and that there are other ingredients which are neither very volatile nor very soluble. Now, to bring chemistry to bear no further than this, the question really is, how to stop the volatile substances from going into the air, and how to prevent the soluble from being washed away. It so happens that these very substances—the volatile and the soluble—are those which it costs most money in the market to import upon the farm, whether the farmer obtains them in the form of guano or in any other form. Now it is certainly very easy to arrest one of these wasting processes, that is to say the washing of the manure; there is no difficulty in preventing the liquid manure from being washed away; and whatever the farmer may say as to the loss being trifling, I am prepared to prove that on some farms which I have seen, of five or six hundred acres in extent, the loss was at least £200 a year. Now this, I say, can in a great degree be prevented. If the farmer, or

his landlord, will not go to the expense of having the farm-yard completely covered over like a railway station, they might at least, by shoots or gutters, prevent the rain from the buildings falling on the dung; the redundant liquid and urine from the dung-heap and cattle should be conveyed into a reservoir, and in dry weather pumped back again over the straw, which will thus more quickly suffer decomposition. You are all aware that vegetable matter decomposes most readily in contact with animal matter. In illustration and in proof of this, I need only refer to the thatched buildings where pigeons are kept. You always find that the portion of the thatch where the pigeons deposit their excrements gives away first. While, therefore, you are to pump the urine back again, so as to allow decomposition to take place more quickly than it otherwise would do, the next question is how to prevent the escape of the volatile materials. Of these volatile matters one is called ammonia; and is easily arrested by means of gypsum, or, what is better still, sulphuric acid. The water in the tank ought to be kept slightly acid by means of sulphuric acid, which will totally prevent the escape of ammonia. If no tank is kept, over all the straw, every day and every night, should be thrown a quantity of gypsum, and the same substance should be applied night and morning to the cow-houses and stables. I come now to the difference between long dung and short dung. This is a long-disputed question, and the practical men have almost got to cudgel blows about it. Now it is quite clear that in bringing down long dung to the state of what is called spit-ding, you lose to a great extent; a certain number of substances are carried into the air, and at the same time the manure becomes to a certain extent decomposed, so that the fibres of the straw, and other vegetable substances, are deprived of their power of cohesion. Now, gentlemen, I am a great enemy to the excessive fermentation of manure. I believe that it ought not to be fermented to anything like the extent that it is done in some places. It is often fermented till one-half is lost; and then we are told that a load of that will do better than a load of long dung. I grant that in some cases; but if 100 loads of long dung be put direct upon the land, and another 100 loads of the same dung be allowed first to decompose and rot until only 50 tons be left, I ask will the 50 tons equal the 100 tons? Will one load of the latter beat two loads of the former (Hear, hear)? I contend, it will not do so well. If you take 50 pounds in one case, and 100 pounds in another, you will find in nine cases out of ten that the long dung has the advantage; because in making the spit-dung you have a large amount of volatile matter sent off to benefit not you land in particular, but the whole neighbourhood, which men are not now philanthropic enough to do on a large scale knowingly (Hear, hear). Well, then,

gentlemen, we have seen that you may arrest the volatile matters, as the ammonia, by applying gypsum or sulphuric acid. I hardly like to name these things among *practical* men, lest I should be censured. I know that some persons have such an antipathy to chemical names as to consider them as anything else rather than terms applied to designate certain substances in nature. But I will venture to speak of one or two things by name. There is the charcoal or vegetable matter of this manure, which goes off into the atmosphere by the action of the air, in the same way as the coals disappear from a fire place, where nothing is left but the ashes; the charcoal having assumed the form of gas and gone into the air. Now, a similar action takes place in the case of manure; and if it be allowed to proceed, almost every particle of the charcoal will pass into the air. Then there is hydrogen, another long name for one of the constituents of water. Another substance is nitrogen. These are also found in farm-yard dung, and they are apt to hop away into the air if decomposition be allowed to proceed too far. Therefore I recommend you not to allow decomposition to go beyond a certain extent, but to let the manure rot and decompose in the land. I will now take another point, namely, the forming of manure heaps when the dung accumulates faster than it can be put on the land. The best plan in such a case is to lay a bottom of mould a foot in thickness. Upon this the manure ought to be carted, each cart passing over the manure previously laid down. The manure ought to be watered copiously with dilute oil of vitriol (one part to twenty of water) or sprinkled with gypsum, if those substances have not been previously used. Upon every two feet in depth of the dung six or eight inches of mould should be placed, and when built to the required height a covering of earth eight to ten inches in thickness should be placed over all. In a compost heap thus made, the escape of most of the valuable ingredients is almost entirely prevented. If any of the ammonia should escape the action of the sulphuric acid, it would be retained by the mould; and by the slow action of the air upon it, nitrates of either potash, soda, or lime would be produced. Whether you are aware of it or not, it is the fact that the saltpetre used by the French, in their battles subsequently to the first revolution, was made from the floors of cow-houses, from old walls, and actually from the urine and dung of animals—the ammonia of these things being converted into saltpetre. Now what produced such an immense amount of saltpetre sufficient for all the wars of Napoleon, when the French were cut off from the East Indies, instead of being allowed to escape, might surely be converted by you, gentlemen, to the purposes of agriculture, which I need not say are very much better than those of war. I come to another point—that of box-feeding, or the feeding of

animals under cover. The best way of making your manure is, I think, either to make it under a large open shed, covered over, or to put your animals upon the box-feeding system followed by Mr. Warnes. I have seen the box-feeding, not only at Mr. Warnes' and Lord Torrington's, but in other parts of the country, and I must give it my unqualified approbation, as one of the simplest means—I do not say the best that could be devised—of carrying out the practical ends of the farmer. Mr. Warnes does not tie up his bullocks, but he has litter under them, and he strews gypsum over this litter. The urine of the animals and the solid excrement are arrested; fresh litter is added when the first gets too wet; and this manure is continually trodden down by the feet of the animal, and this treading so solidifies it, that just that necessary amount of fermentation takes place which produces a good solid black dung. I am not now going into the question of cooking food for animals; I shall leave that part of the subject for a future time. I must, however, now proceed one step further, which practical men will, I dare say, consider an absurdity. Gentlemen, my opinion is that the time will come when you will have your bullock-houses warmed by as genial fires as those in this room. I will tell you my reasons for thinking so. The food, or at least a portion of the food, which you give to animals, goes, as I before told you, to keep up their temperature. Now the more cold to which an animal is exposed the more food is required to keep up the temperature, which must be kept up or the animal will die. We all know that in cold weather an animal parts with more heat than in warm; consequently he must consume a much larger amount of food to furnish this heat, and this is the reason, and there is no other reason, why you cannot fatten animals in winter. In the winter the animal merely consumes to keep itself comfortable. The animal only produces fat when he has got more food than is required to keep the proper temperature of the body. If you were to keep a fat and lean animal without food, you would find that the fat animal would outlive the other for many days, in consequence of having been able, by excess of food at other times, to lay up a store for other days. You must not suppose that the animal lays up fat merely for your use; it lays up fat for the purpose which I have stated, and it is only when it is able to satisfy itself as regards warmth that it lays up a particle of fat. This, I repeat, is the reason why you cannot fatten animals so well in the winter as in the summer. Now, mark what is the idea of the practical man on this subject. The practical man never thinks of buying a pound of coals to warm the animal, and thus, at the same time, to save the consumption of food. Now I do not call that very practical; and I venture to assert that the more practical idea of the chemist will eventually be carried

into effect. Instead of valuable food being consumed for the mere purpose of keeping up the animal's warmth, there will be a consumption of coals, which are much cheaper, for that purpose, and then you will be able to fatten quite as well in the winter as in the summer.

Having thus mentioned the chief points relating to manure—and I do not recollect, at this moment, any other point of special importance, except with reference to artificial manures, to which I will refer at the close—I will proceed to speak of the rotation of crops, and of the means by which vegetables live.

CORRESPONDENTS.

ON THE IMPORTANCE OF A PROPER CARE AND MANAGEMENT OF FARM YARD MANURE.

The difference of circumstances between Canada and Great Britain, or even the United States, renders inapplicable many of the rules which are admitted to be thoroughly established in the practice of the farmer of those countries. There are numerous points in which a perfect assimilation of our agriculture, with that of the people to whom we naturally look for example, cannot possibly take place. In some, the climate offers a cause for variation; in others, the soil and its condition, or the price of produce, or the rate of remuneration for labor. But in the main principles on which our system of cultivation should be based, there can be no variation; and one of the points of primary importance in the economy of a farm, let it be situated where it may, is the preservation and preparation of the manure afforded by the stock which it maintains.

There is, perhaps, little probability, that the Canadian farmer will ever be in a situation to employ his putrescent manure in a liquid state. It is true, that were manure in this form furnished at the season when it could be applied to a growing crop, its effects in Canada, as ascertained from practical experiment, would be not less beneficial than they have proved elsewhere. But from the nature of our climate, this season is very short, extending, perhaps, to a period of about ten weeks of the months of May, June and July; while for several months comprehended in our winter, and during which we retain our cattle within doors, the degree of cold, and the dryness of the atmosphere form so effectual a preventive to liquidity, that the urine

cannot be collected, much less made to pass through the requisite stages of fermentation, after mixture with the solid excretions of the animals. In a practical sense, the employment of liquid manure seems to be, for these reasons alone, beyond the present consideration of the agriculturist of this country.

Our climate is, indeed, unfavorable also, in respect to the manure which our barn and cattle yards supply in the common form. For, in the course of its collection, in the long winter, a large quantity of snow and ice are enclosed within the unsheltered heap, which thus remains at a temperature too low for fermentation in any degree; and, on the advance of spring, the sun and the abundant rains, melting these, carry off a large proportion of all the soluble and most valuable parts of the dung. After this effectual washing it undergoes a violent fermentation, from which it suffers equal injury, although in a different manner, others of its valuable elements passing off in a volatile form. In this country, more than any other, the exposure of manure is attended with disadvantage; and it may be safely affirmed, that for the want of attention in this matter, a large annual loss is sustained by many who possess a just idea of its importance in affecting their interests.

The object of this paper is not, however, to find fault with practices which are admitted to be governed to some extent by the circumstances in which we stand. It is rather to raise the question, whether there are not modes open for our adoption, by which we may secure the preservation of more of the valuable elements of our farm yard dung, and bring it into a form more suitable to our purpose, at the required time, without being led to the application of too great labor and expense in our procedure, or into such elaborate operations as might prove of troublesome practice.

In Europe, and latterly in the United States, dung is almost always worked into compost, by being mixed with other substances, as peat, lime, marl, gypsum, &c., and there is little question that such a process is amply remunerative. But the Canadian farmer is not often permitted by the season, or his own resources, to copy the example, and test its value to him.

In England and Scotland, at the present day, it is becoming common to transfer the stable

dung at once to covered places of deposit in which it is prepared for employment; and this might be done equally in Canada. The result here would prove less satisfactory, however. There must be some increased expense in the requisite buildings, and there could be no saving of labor; while the accumulation of the entire winter would require removal within one short period of the spring.

Where the practice is followed of feeding cattle under sheds, connected with small yards, as in the foremost agricultural counties of Great Britain, there is no labor involved in the care of the dung, which remains under the stock until finally removed to the field. But in this case, much more straw is employed as litter, than our farms can generally afford. Without an abundance of bedding frequently renewed, animals kept in this way, must suffer from wet and filth.

Perhaps the system that has been recently brought into notice in England, in connection with the fattening of cattle, would meet the circumstances of the Canadian farmer, better than any other directed to the securing of the manure in its full value. It has been ascertained practically, that animals in the course of fattening, thrive better, and consequently consume less food in reaching the same value, when kept in loose boxes, than when tied to the post, or within stalls; and that boxes for a single animal are preferable to those for two or more. There are, accordingly, many farmers who have already adopted the plan of feeding boxes nine or ten feet square, enclosed and purposely covered so as to maintain the most suitable temperature, and communicated with by a passage for the conveyance of food and litter, the former being furnished in a sliding rack or manger, made to rise as the manure accumulates. These boxes are not floored. They are, on the contrary, excavated where the soil permits, and there is proper drainage to the depth of a couple of feet or more: A good thickness of litter is placed in them when the animals enter, and small quantities are added subsequently as cleanliness requires. But the dung is not disturbed until removed for direct application to the land; and it is found that the close packing of the animals feet preserves it most completely from too violent fermentation, while the mass retains all the valua-

ble properties originally contained in the urine as well as the dung.

There is nothing to prevent the practice of this system in Canada; and in reference not merely to fattening cattle, but to the entire farm stock necessarily housed during our winter. An objection may arise on the point of the increased extent of stable room which the loose boxes would demand. But this objection is, in itself, not insuperable; and full enquiry will show that very little, if any, additional room is required for the change. The superficial space allotted to a full grown ox, in an ordinary stable, is about fifty feet, exclusively of a feeding passage.—For cows and steers about forty-five feet. A loose box for the larger size would be required to contain about ninety feet,—for the smaller, about seventy-five feet; so that for fattening cattle, or milch cows, receiving the more valuable descriptions of food, and consequently requiring accommodation singly, the buildings must be about two-thirds more extensive than at present. With respect to other stock wintered equally in hay or straw, as in ordinary cases, there would be no extra room required. Two, three or four head of young cattle, for instance, might be wintered in a loose box of the extent in feet which the same cattle would occupy when tied up. A material part of the expense of stabling always consists in the cost of the floors; and these require renewal at very short intervals. In the loose-box system no flooring is wanted. Supposing, therefore, the superficial space of stabling were required to be increased by one-third to admit the whole farm stock, the additional cost of enclosing and roofing, would be more than met by the saving in sleepers and planks.

But of what consideration would be any such additional expense in buildings as seems possibly necessary, in comparison with the ascertained advantages which this plan affords. The cattle are unquestionably maintained in better health and condition, with less attendance; and the manure is preserved in such manner as to be infinitely more valuable than when left exposed, without involving labour in any amount whatever, up to the time of its final removal.

As before mentioned, the treading of the cattle consolidates the mess sufficiently to secure an equal moderate fermentation, and the litter, of the coarsest kinds, is completely incorpora-

ted with it. A large quantity of litter may be employed, and converted into manure; or, if fodder should be scarce, a less quantity than is absolutely necessary to render comfortable, cattle which are tied up, may be made to suffice in the loose box, for keeping them both clean and dry. As the fermentation is slow, no ammoniacal gases are evolved, and there is consequently no foul odour. But to obviate all risk of such objection, powdered gypsum, or slaked lime, or the house ashes, sprinkled through the stables from time to time, might be turned to the best account with the least possible trouble.

It is to be hoped that the plan here suggested, offering as it does so many points of suitability to our circumstances, may be early put in force by some of our enterprising farmers; and that the experiment, whether in itself completely successful or not, may lead to a general improvement in our present very defective system in regard to the treatment of what must ever constitute a main source of our agricultural wealth—Farm-yard manure.

PARSNIPS.

YAMASKA RIVER, *March 19, 1849.*

WM. EVANS, Esq.

SIR,—Though not a practical farmer, having never been educated that way, though always from a boy having an inclination expressly to that part of agriculture belonging to the culture of roots, and having had a more favourable opportunity for the last twelve or fifteen years than I had for as many years before, and as potatoes are no longer to be depended on an average crop, particularly in this part of the country, where last year I may almost say they were altogether a failure—any thing in the root way that might be recommended as a substitute, attended with as little expense or trouble as possible, I thought might be acceptable. Therefore, Sir, if you think the following experiment made by myself merits your attention, or an insertion in the Agricultural Journal would any way benefit others, I may reasonably hope I have only done what I ought to consider myself in duty bound, or any other person in possession of such plain simple truths to do, in communicating them to you.

I wish it to be understood, what I have done that way has always been done with the plough, and not with the spade, so that the results would have been the same in all cases whether more or less ground had been obtained.

I have for the above period yearly raised potatoes, turnips, mangel or beet, carrots and parsnips. Of potatoes I have nothing to say. Turnips I have always found attended with a great deal of trouble, on old land an uncertain crop. Mangel or beet I never succeeded in like anything to what I have seen at home. Carrots I have raised here at the rate of four hundred bushels the acre, and that too on naturally a poor cold stiff clay, but had previously for some years been liberally supplied with dung—parsnips I think quite as good as I ever saw raised in an English garden. Carrots, since the potato disease, have not produced any thing like what they did before. Though the carrots do not rot, the leaves turn black, and the roots and tops do not grow so well. The parsnip, though planted alongside either of them, still grows on heedless of the troubles and mortality of its neighbours; indeed one would think that like the world, it profits on the loss and ruin of its old friends.

I wish to remind you, Sir, my present location is the lower bank of the River Yamaska; my first one was the higher; perhaps that may be the cause why my carrots the last few years suffered with the potato, as all planted down there have mostly been good for nothing. I intend this year to sow some on the upper bank to see if there is any difference. Now, Sir, my plan in cultivating any of the above roots is the following: knowing well as I do, most all Canadian farmers are an easy going people, therefore it would be useless attempting to intrude any new thing that was not founded on the easy going system, namely, plain, simple and easy to be understood. Plough a good piece of stubble land in the fall—either late in the fall or as early as possible in the spring—cover it with as good old rotten dung as can be got, plough it in deep, but so as to have only about three furrows to each ridge; when done ploughing take a spade or wooden shovel and pass through each furrow, cleaning it out and putting all the loose mould on the top of the ridges; take a small rake, level the ridge, putting off any clods, stones

or the like; take a stick or wooden fork and draw two drills about six or eight inches apart, not more than one inch deep; drop in the seed by finger and thumb; take the back of the rake and draw into the drills the light mould, leaning rather heavy on the rake than not. Let weeds, plants and all grow up together, until the plants are in the third or fourth leaf. Children can pull out the weeds, and aged persons following after, if need be, to thin out the plants. If the furrows get too foul run a one horse plough up and down. In hot weather that is all that is needed; as to preservation in winter, turnips, carrots or beets cannot be left out all winter in all situations without a great risk of losing them. To put them in great quantities in ordinary cellars, they heat too much; in sheds or barns they will freeze and thaw, just as the weather changes, and must be more or less injured. But here I find the parsnips standing forth as it were biding defiance to even a Canadian winter, either untouched in the ridges or taken up and deposited in small holes and merely covered over with about five or six inches of mould. I opened a pile yesterday, the 17th March, containing about six bushels, and found them quite good. No other root would have endured such a winter as this that I know of. In the month of April, when the tops begin to sprout, cut off a thin slice of the top, and they will continue a month or so longer in a cellar, fit for either table or stable.

Now as to their use, turnips, carrots, beets, &c. are all excellent, but as far as my experience has gone, I have in all cases decided in favour of the parsnip, first after the potato, for all culinary purposes as daily food, more palatable and substantial than any of the other roots; then, as for cattle, any way, either for fattening or increase of milk, from the month of October to the end of May following, and that too in a raw state; also for lean pigs, as they will live and thrive on them during winter without any grain; or sheep that have just weaned; and, if I recollect right, in my part of England—Norfolk and Suffolk—turnips, &c., in the month of April are far advanced towards seed. If so, then we, Canadians enjoy an advantage that an English farmer knows nothing of. Then as to seed, I have raised almost all kinds of garden seeds in Canada but have found

none so sure, so easy, and so soon ripe as the parsnip; so that any farmer may raise his own seed. A few roots planted early in the spring will ensure him good seed for an acre of land next year. The sum to tell of this, is, I think, Sir, you will agree with me, that the parsnip is decreed by a kind Providence as the Canadian farmer's friend in every respect, as much as the turnip has been the English farmer's friend or help in improving and preparing his ground.

I am, Sir, yours, &c.,

P. N.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—In pursuance of advertisement, a Public Meeting was held in the Parliamentary buildings in this City, on Monday, the 19th instant, Sir H. Caldwell in the Chair. The following Resolutions were unanimously adopted.

1st. It is the opinion of this meeting that an Agricultural Society be established, to be called "The Quebec Agricultural Society."

2nd. That an annual subscription of five shillings do constitute a Member of the Society—all members, however, to be resident within the District of Quebec.

3rd. That a Committee of twenty-four members be now appointed, with power to add to their number, to form a Managing Committee of this Society, who shall elect from their number a President and three Vice-Presidents, two of the latter to act as Secretary and Treasurer; also be empowered to form a code of Rules and Regulations, to be submitted for approval and adoption at a general meeting of subscribers.

The meeting then proceeded to ballot for the Committee of Management, when the following members were elected, viz. :—

QUEBEC.—Messrs. N. Aubin, H. Burstall, R. Coles, R. Middleton, Dr. G. M. Douglas.

ST. FORT ROAD.—Sir H. J. Caldwell, Bart., Messrs. Davidson, R. Cassels, F. G. Jobb, A. Hamel, W. West.

LITTLE RIVER ROAD.—Messrs. J. Dinning, W. Bell, P. Langlois.

ST. LOUIS ROAD.—Colonel Sewell, Captain Rhodes, A. Young, J. Gilmour, A. B. Hamel, J. Wright, J. Porter, J. Ross, P. Wilson.

BEAUFORT ROAD.—Mr. J. Mussen.

At a subsequent meeting of the Committee, Sir H. J. Caldwell, Bart., was elected President of the Society, Captain Rhodes, First Vice-President and Secretary, R. Coles, Esq., Second Vice-President and Treasurer, M. W. West, Esq., Third Vice-President.

Orders have been sent to Guernsey to import an Alderney Bull and Cow, about three years old.

The following order for seeds was agreed upon, to be sent for to Scotland :—

Oats, (Hopetown,) 25 bushels; barley, (chevalier, bright,) ditto; wheat, (black sea,) one quarter; do. (golden drop,) ditto; pea, (large gray field,) 4 bushels; early horse beans, ditto.

A letter was read from A. C. Webster, Esq., of Meadowbanks, near Montreal, enclosing samples of a very fine variety of wheat, and of the mazajan horse bean, which were highly approved of, and orders have been forwarded for a small quantity of both seeds. The Lower Canada Agricultural Journal having been recommended to the favourable notice of the Society, several members enrolled themselves subscribers, and it was resolved that a copy of these proceedings be forwarded to that Journal.

W. RHODES,

Vice-President and Secretary.

Beremore, March 24th, 1849.

GROWTH OF FLAX.

SIR,—The importance of the cultivation of Flax, as regards Canada, having been frequently adverted to and advocated in your Journal, it may be interesting to many of your readers to know the exertions that have been made in New Zealand by the new settlers there, to introduce the regular cultivation of that article for export to Europe, and for that purpose I transcribe a passage from a new work of Mr. Petre's, written in 1841, embracing this and other subjects relative to the Colony of New Zealand:

"The native hemp, or *phomium tenax*, is the article of local produce, which of all others can, with least delay, and least capital, be rendered fit for export in large quantities. It can be procured in a state fit for making cordage within six months from the present time, if an adequate capital be immediately raised, and proper machinery be erected and set to work.

"It can be prepared in any required quantity

at a price which would command an extensive and ready sale, and, at the same time, leave a large profit to those engaged in the trade of preparing it. As a rough estimate of the value of this important article, I beg to submit the following calculations for consideration :

" Let it be supposed that in a flax farm of one hundred acres in extent, each plant should occupy a space of two square yards, or a square of nearly fifty one inches on the side, the total number of such plants to an acre would be 2,420; take as an average, each plant to yield twelve pounds of the fresh-cut green leaves per year, this would give rather more than 2,900,000 lbs., or about 1,296 tons, annually, of fresh cut leaves, off a farm of one hundred acres extent.

" I have prepared a small quantity of the fresh cut leaves, by way of experiment, and the result enables me to state, that about one fifth of the gross weight of green leaves, prepared according to my plan, can be had of hemp in a fit state for making good ropes or cordage; besides which, a quantity of coarse tow, equal to about half the weight of the fresh cut leaves, is obtained in the operation of cleansing the hemp of short fibres and pulp. There would, therefore, be procurable from such a farm, about 250 tons of hemp in a proper state for the rope-maker's use, and about 600 tons of a coarse tow, fit for making ropes of inferior quality, and coarse packing canvass.

" This coarse tow would, if sold so low as £3 per ton, almost cover the whole first cost of the prepared hemp, including rent, expenses of cultivating and procuring the raw leaves, and the wages of the operators engaged in the preparation of it. The hemp, if sold even as low as £15 per ton, would be nearly all profit, as the cost of preparing it would be almost, or altogether, covered by the value of the tow. A capital of no more than £5,000 would be sufficient to set on foot an establishment capable of turning out from 600 to 700 tons annually, and in any case, would pay full 50 per cent profit on the sale of the hemp sold."

In Canada I believe flax grows naturally, and with proper cultivation and encouragement from Agricultural Societies, no doubt it would become an extremely profitable crop, and in this view, Mr. Editor, let me hope you will give the subject every aid in your power.

A CANADIAN.

HISTORY OF THE INVENTION, USES, &c. OF "ANDERSON'S SUBSOIL GRUBBER."

"The Highland and Agricultural Society of Scotland" in 1846, offered a premium of ten sovereigns for the *best Subsoil Grubber*, to be competed for at the Society's exhibition held at Dumfries that year. For this an intelligent farmer, James Anderson, Howwood, Ayrshire, competed and was awarded the premium offered. Previous to the Society's announcement of such, he had invented the Subsoil Grubber and others knew partly the principle of its construction. Some of those who competed against him, although they had seen his drawing overlooked that which constituted its efficiency and which gained the prize, namely, *the placing of the teeth*. His competitors placed the first tooth (or *leg* of the grubber as it is called) nearest to the horses, exactly opposite to his; this was an obvious defect, as the operation of *subsoiling* is intended to *follow the plough*, for by the placing of Anderson's the least resistance is exerted; the first tooth by penetrating the furrow side of the land to be subsoiled opens the way for the easier penetration of the ones behind. Whereas by the foremost tooth being placed on the opposite side, it was wedged in by the firm land on that side.

It now entirely supersedes the horse hoes and other drill grubbers formerly used, as being from the arrangement of the teeth infinitely better calculated to clean itself in foul land. And where subsoiling is required, and where two horses can be spared for pulverizing drill crops of any kind, it can be made so strong as to serve the purposes of both a cultivator or horse-hoe and subsoil grubber. Since its first invention an excellent improvement has been made upon it, by attaching a bar of iron about three feet long and placing two additional tines or teeth upon it, for grubbing or working land for drill crops, such as potatoes, turnips, &c., &c., instead of ploughing. By regulating the depth by the wheel it can be proportioned to the draught of two or more horses. Generally when wrought with two horses it is regulated to penetrate about six inches, and again, a second time, six inches more; but all that, in most soils, could be done at once by putting in horses abreast. It takes in a breadth of as much as three (or I should say four) furrows because cross ploughing is best when narrow and

deep executed,) and is therefore more expeditious than ploughing for pulverizing land for putting in drill crops. It has also one decided and admitted advantage over ploughing in the preparation of land for crops such as those above referred to, namely, the quality of retaining the moisture necessary to germination or brairding, as by its operations the soil is not exposed to the drying influences of sun and wind, as is done by the turning up by the plough. This was especially thought a great thing in the planting of potatoes in late years, when putting them in on heated dung and saples searh was considered and justly, to accelerate the disease or rot. The Grubber is esteemed in Scotland an efficient implement.

J. SYMINGTON.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—It cannot be doubted that the interests of Agriculture are greatly neglected by those who, above all others, should endeavour to promote its improvement, that is, by the educated individuals engaged in the pursuit, for there is no such thing in this country as an educated class of Agriculturists. Your own persevering exertions in the cause, Mr. Editor, in the discouraging and trying circumstances under which you have labored, has merited every consideration from the Agriculturists of the Province. Although I cannot claim, (as you may perceive,) to be one of those individuals, whose advantage of knowledge call upon them to contribute some of it to the benefit of their fellows, perhaps some plain observations from a practical man may be of some use.

One of the great disadvantages you labour under, as well as the country, is the manner of distributing your work: among us, few read at all, and still fewer understand what they read; any expense imposed upon them for agricultural information, in which they believe themselves all sufficient, is at once rejected; even the postage would be a burthen; and it has not unfrequently happened that when I have tried to persuade some of my neighbours to take your work, that they have refused, saying that they should not like their friends to know that they were in need of it; so even in this obvious case, "men must be taught as if you taught them not."

Now, to remove in some measure the difficulty, allow me to say that the statute, commonly called

the Agricultural Act, might be made infinitely useful; but as it now stands, the Agricultural Societies are obliged to advertise their exhibitions in some public journal in a detailed form; and in many cases, where there is a mixed population, in a French and an English one. Now, the expenses of the Society to which I belong stand thus:—

	£	s.	d.
French publication for spring exhibition,	4	5	0
English do do do	3	10	0
Now, as many of our subscribers happen to take neither of the papers, whichever may be selected, it is necessary to print hand-bills to distribute,.....	1	10	0
	<hr/>		
	9	5	0
These exhibitions and visitations of crops take place three times a year,.	18	10	0

Total expense of each Society,....£27 15 0

I do not mean to say that all Societies are equally expensive; but when both languages are used, this is not far from the truth, were they to carry out the statute to the letter. Now, Mr. Editor, it must be remembered that this expense is all gone into without the remotest prospect of spreading agricultural knowledge or experience. If, on the contrary, the Agricultural Journal were made the legal means of communication from the Agricultural Societies to their members, the circulation of that useful publication would be so far increased as to enable the publishers to afford a greater variety of information, and especially in plates and cuts and plans, greatly wanted in a country more attracted by the eye than the mind; and further, the farmers would be induced to take it, to know what was going on in their own County Societies, to learn the prizes offered, and the nature and conditions of the premiums, and avoid the necessity of acknowledging the source from which they draw their information until they have learnt to know better. Not only would this method force upon the agriculturist a large amount of knowledge in the way of reading, but would much more effectually carry into practice the proposed advantages derivable from the County Societies themselves.

I would not be understood to throw out any reflection on the County Societies, the intelligence or disinterestedness of their general direc-

tion or ultimate usefulness; but I do say, that under a better system it might be greatly improved, and at no greater expense to the public. Under the present system, the competitors have no other view than the getting the premium or prize; it is looked upon more like a lottery, where their dollar gives them a chance of a pecuniary prize, than a Society where a fair competition of well directed industry and sound farming principles successfully carried out, will meet with an honorable reward. There are many good reasons for this anomaly, and the first is that the Committee is too much in the power of the expecting public, for unless they immediately gave up and distributed the moneys received, without reserve for future contingencies, and with the least possible delay, such a clamour would be raised against them, that they would not comfortably keep, or perhaps possibly keep their places, and their successors would be in a worse predicament.

The premiums offered are often forced upon them by the known possessions of some popular individual, rather than as an incentive to the production of more useful articles known to be wanting.

The Secretary should be named and appointed by the Committee, not by public election. A merchant might as well allow his clerks to be elected by his customers as the Secretary to an Agricultural Society be elected by the public.

Much expense is also incurred from the necessity of procuring judges not inhabiting the County, whereas many equally disinterested and competent persons might be found in the neighbourhood of the exhibition.

But the greatest error of all is the difficulty, if not the impossibility, of the Committees to establish Pattern Farms on the present system. Pattern Farms are really the only remedy to our present imperfect and almost ruinous practice. It is the only way of proving experimentally the advantages of the improved implements of husbandry; no explanation or drawing, however correct, will suffice, not even the model itself, the effect and result must be clearly made apparent, and that can only be done by the actual operation on a real field.

I fear that my letter is already too long. I have much more to say, but indeed I am not aware that all I have said has not been much more ably treated in your Journal, and that you

are tired of the repetition without effect; if so, you are at liberty to make any use, or no use, of this letter. It will, at any rate, have afforded me the pleasure of assuring you of my high respect, and admiration of your untiring labours, and that

I am, Sir,

Your most obedient humble servant,

TRIPTOLEMUS.

ELEMENTS OF BOTANY,

GENERAL ATTRIBUTES.

1. Plants are scarcely separable from animals by any absolute character; the simplest individuals of either Kingdom being often undistinguishable by our senses.

2. Animals are for the most part incapable of multiplying by mechanical or spontaneous division of their trunk, and are supported by nutritious matter, carried into their system from an internal bag or stomach.

3. Plants are for the most part congeries of individuals multiplying by spontaneous or artificial division of their trunk or axis, and supported by nutritious matter conveyed into their system by the absorption of their lower extremities or roots or by their outer surface.

4. Generally speaking, they are fixed to some substance from which they grow, are destitute of locomotion, are enabled to digest their food by the action of the light upon their skin, and form starch at some period of their lives. Animals, on the contrary, seem never to form starch.

5. Like the simplest animals, the simplest plants are vesicles, or vesicular threads, and the most complete plants may be regarded as indefinite multiples of such vesicles arranged in definite forms.

6. They are composed of tissue, out of which the elementary organs are constructed.

7. When first formed tissue consists of a substance called cellulose; its chemical nature is rapidly altered by the addition of lezotized and other matters, and especially by an increase in the relative proportion of carbon.

8. It is a hygrometrical substance, possessing adhesiveness, elasticity, extensibility, irritability, and vitality.

9. Its adhesiveness enables the elementary organs to grow together readily when in contact.

10. Its elasticity permits it to bend and recover, or to stretch and contract itself; the former a property essential to plants in consequence of their exposure to atmospheric disturbances, from which their want of locomotion prevents their escape; the latter demanded by the emptying and filling processes which are incessantly in action in the elementary organs, while growing.

11. Its extensibility enables it to enlarge as

new matter is added to it, and to receive the fluids or gases absorbed from without.

12. Its irritability renders it susceptible of the influence of light, heat, and similar external forces.

13. Its hygrometrical quality causes it to absorb water greedily when presented to it, an essential condition of vegetable life.

14. Its vitality keeps all these qualities in play, enables plants to digest and assimilate their food, and their various organs to perform their manifold functions. Nothing can more strongly mark the ignorance which some modern chemists betray of the facts of vegetable life than their denial of vitality, and reference of every phenomenon to chemical action. If they are right the motions of fluids, the construction of tissues, the decomposition of matter, and its combination in new forms, with the thousand other circumstances of vegetable growth, should go on as well in organized as in brute matter, provided their chemical proportions are maintained.

15. Its various forms are held together by an organic tissue; itself is generated. This mucus has received the name of intercellular substance, and also of cambium, when it is exuded by the parts of an already organized plan.

An objection may be taken chemically to this view but it seems to be physiologically correct.

16. Tissue occurs in the form of the cellular, the woody, the vascular, the pitted, and the laticiferous, the different modifications of which constitute the Elementary Organs.—*Lindley's Botany*.

ALLUVIAL SOILS.

I beg to lay before you some experiments of mine on the draining of marshy land. It so happens, that I have a large quantity of this sort of land. When drained, it is perhaps the most valuable of any; it has sufficient strength to bear magnificent crops of wheat, and as, by being laid dry, it falls into a powdery state, easily worked, it will produce all sorts of roots, particularly mangel wurzel or carrots, to great advantage. But, if undrained, it is much the reverse of this; the wet lodging on its surface, it runs into a sort of putty-like cohesion; it is then little better than the strong clays under similar circumstances. Turnips, not drawn before the weather breaks, have been known to remain until they have become quite rotten, from its being impracticable to have them removed by carting. I will now mention a field of my own about 10 acres, which was drained many years ago, with horse-shoe tiles. On examining these drains last year. I found them entirely choked with sand. There were accordingly taken up, and the land was drained early last spring with what are called the D tiles. Some rough bad hay was placed upon the tiles, but on inspecting these after a crop of potatoes had been ta-

ken up, it was found that a considerable quantity of the sand had insinuated itself through the junction of the tiles, and it is believed that in 10 years these drains will be a little better than the former. To prevent the admission of sand into the tiles, two methods have been tried; one is the use of tiles with collars. This has been much practised by Mr. Josiah Parkes, at Drayton Manor, and elsewhere. The other method is to put a layer of clay on the tiles. If the collars fit very close, they may exclude the sand, but that is frequently of such a subtle nature, that there is always a danger of its penetrating through the interstices. A layer of clay is a more certain preventive, but then this is often not near at hand, and becomes expensive in the carting. Mr. Linton, in the *Royal Agricultural Society's Journal*, has given a good account of his draining a running sand in his manner, which has been entered in my "New Husbandry," p. 81. He says the tiles and bottoms should be laid as close to each other as possible, and on them should be placed a covering of about 4 inches of the most tenacious soil that can be procured. Clay would be used, but on account of its being in large lumps, it cannot be made sufficiently close to keep out the sand. Here I must observe that it is essentially necessary that the drains be cut 3 or 4 inches wider at the bottom than the width of the tile, so as to admit the strong soil down the sides to the very bottom; much mischief is done by the sand getting in at the bottom part of the joinings of the tile. Other materials have been used for keeping out the sand, when it can be got sufficiently loose and malleable, so as to bed quite close and firm, and leave no crevice. Straw and other perishable materials are to be particularly avoided.—*Agricultural Gazette*.

MANURING GRASS LAND.

Experiments are so numerous and well defined, as to leave but little doubt about the best select dressings. The nitrates and guano increase the produce of hay as well as grass. Salt and sulphates increase the hay from a given weight of grass, but do not give so much on the whole as the nitrates, &c. Nitrate of soda and nitrate of potash mixed—nitrate of soda and sulphate of soda mixed—nitrate of potash and sulphate of soda—have each given large produce. Sulphate of ammonia has produced very heavy crops: but it is not recommended for milk pasture, as spoiling the cream. Salt would probably correct this, and would supply alkali. Soot and guano have been each very productive, and improved by salt; guano by gypsum also. In many of the most successful experiments, much more compound mixtures were employed than those quoted under our several headings; and for which the inquisitive reader must refer to the original papers, as they would

here occupy too much room. It may, however, be taken as a general rule, that the greater the number of the ingredients suited to the plant, and judiciously compounded, which a dressing contains, the more effectual and productive it is likely to be. All seeds and grain require phosphates; nitrogenous manures force juicy vegetation; salt sulphates give solidity; and these qualities may be borne in mind whilst preparing our dressing; so that whilst some squares of our guide plot may follow exactly the successful experiments reported, others might try improvements of their own, either for quantity, quality, or economy.—*J. Prideaux.*

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, APRIL, 1849.

The Annual General Meeting of the Lower Canada Agricultural Society took place at their Rooms in this City, on Saturday, the 24th March last, in conformity to the Provincial Act of Incorporation, and to the Rules of the Society. The Hon. A. N. Morin, President of the Society, took the Chair, and addressed the meeting, giving a brief outline of the proceedings of the Society for the past year, and their future prospects. The Report for the past year having been then read by the Secretary, it was moved by the Hon. C. C. S. DEBLEURY, and seconded by Dr. MEILLEUR, That the Report be adopted;—which was carried unanimously.

The Financial Report was submitted and read. Also, detailed statements referring to the Agricultural Journals, subscriptions, and other matters, were placed before the meeting. A letter from Mr. Crofton, referring to statistics, and one from Mr. Langevin, formerly Editor of the French Agricultural Journal, were both read.

Thirty-three Directors were then elected, namely:—Hon. A. N. Morin, Speaker of the Legislative Assembly; Major Campbell, Civil Secretary; Honbles. P. B. DeBoucherville, F.

P. Bruneau, G. R. S. DeBeaujeu, A. Ferric, C. C. S. DeBleury, and J. Molson; Dr. Taché, M. P. P., R. N. Watts, M. P. P., D. M. Armstrong, M. P. P., A. Jobin, M. P. P., Jacob DeWitt, M. P. P., Rev. F. Pilote, Rev. J. Desaulniers, John Yule, P. E. Leclere, J. N. Poulin, A. Vandandaique, Colonel Hanson, A. N. Archambault, J. Thompson, Alfred Pinsonnault, A. Turgeon, John Gilmour, Charles Penner, Alexander Morris, J. L. De Bellefeuille, J. B. Meilleur, H. L. Langevin, Arthur Webster, senior, J. Guilbault, and William Evans, Esquires.

On the list being read, it was proposed by Mr. LECLERE, and seconded by Major CAMPBELL, that the gentlemen elected be approved of as Directors for the ensuing year; which was carried unanimously.

It was then *Resolved*, That Mr. Evans be instructed to call a meeting of the Directors elected this day, for Tuesday, the 3rd of April, at 11 o'clock, A. M., for the purpose of electing a President, Vice-Presidents, and other business.

The President having left the chair, and the Hon. Mr. DeBeaujeu being called thereto, Major CAMPBELL proposed, seconded by Mr. MORRIS, a vote of thanks to the Chairman for his dignified conduct in the Chair; which was carried unanimously.

REPORT.

The President and Directors of the Lower Canada Agricultural Society, for the past year, beg to submit to this General Meeting, the following Report:—

And First—they congratulate the friends of Canadian Agriculture, assembled here to-day, upon having a place of meeting exclusively appropriated to the interests of Agriculture, and the advancement of its improvement and prosperity. For the first time in Lower Canada, an Agricultural Library has been commenced, and even at this early period of its establishment, contains, as you may perceive, many excellent books in both the English and French

languages, on the science and practice of husbandry, and several of the most valuable periodicals, with a prospect of the number being augmented continually, affording to agriculturists, by becoming members of the Society, constant access to useful information on the subject of their profession, that is not to be obtained elsewhere in Lower Canada.

The seed store, opened in the same premises by the Seedsman of the Society, affords an opportunity of purchasing seeds of every species and variety on favourable terms, as well as offering the farmer an opportunity of showing any superior grain he may have to dispose of as seed, to those who may require such seed. There is a further advantage, that foreign seeds of any kind may be obtained through the Seedsman, by giving an order in due time. A show of Implements is commenced, which there is every reason to expect will be well stocked before the next Annual Meeting. All these are direct advantages.

The next subject they would advert to, is the Agricultural Journals, published both in the English and French languages, for the past year and up to this period of the present. It is needless to state to you what may be the merits or defects of these Journals, as no doubt you are all subscribers to them, and perfectly acquainted with their character. The Directors regret to have to report that a large portion of the subscriptions remain unpaid, and it is an extraordinary circumstance, that while in some parishes and sections of the country, nearly the whole of the subscriptions are paid up willingly, in others, scarcely any have been paid, and the Directors have reason to believe, that the Journals have had a most beneficial influence among the farmers, and disposed them to introduce improvements. The expenses of the Journals and the state of the subscription list will be submitted to you to day.

The Agricultural Journals were the only means of maintaining a connection and correspondence between the Society and the agricultural classes, and each of the great National

Agricultural Societies of the British Isles, publish a Journal, and regard it as a chief means of connection with Agriculturists and of advancing the improvement of husbandry. The Society have been organized and incorporated by the Legislature, and have so far proceeded in the great work they proposed to accomplish. If they meet with any check now, it will be solely attributable to the want of adequate support. The objects for which they have been organised are of as much importance to the country now to be attained, as they were two years ago, and the Directors of the Society have, so far, done all in their power, in proportion to the means at their disposal, to attain these objects. They have done more than could be expected by incurring a very considerable responsibility in publishing the Agricultural Journals, and forwarding them to every Parish, and to the Commissioners of every country school in Lower Canada, with a view of awakening a spirit for improvement in the general system of Canadian husbandry, and that they might be read in the schools by the scholars who are hereafter to become farmers. This measure was adopted as the only possible means of connecting the Society with the rural population throughout the Eastern section of the Province, and to show them that there was a Society organized, which, however remote and separated by distance from them, were anxious for their welfare and desirous that they should introduce such judicious changes in their modes of farming as would likely prove advantageous to them—and the Society had the more confidence in the success of their measure, because there could not any suspicion of self-interested motives be attached to their efforts with the rural population—whose perfect confidence is so necessary to any Society who would propose changes in a system farmers were so long accustomed to practice. The Society were desirous of being regarded by the rural population as the Society of the People, actuated by no other motive but that of promoting their prosperity and augmenting their means of comfort and happiness

by suggesting the means to them by which they might attain these benefits from the resources within their own power. The proposition is generally admitted that agriculture is, and must be, the main stay of prosperity to this Province; and it may be presumed there is not one individual at this meeting that does not entertain this opinion. This Society, as the Agricultural Society of the people, cannot possibly have any other object than the improvement and prosperity of agriculture, as the best means of giving strength and stability to the main stay of Canada; and if they will only follow the example of the great Agricultural Societies of the British Isles, they will confer a greater amount of unmixed good on the rural population, and upon the country generally, than could be expected from any other measures possible to introduce. One of the principal objects for which this Society was organized was the establishment of Model Farms and Agricultural Schools. To accomplish this, considerable funds would be required. The question then appears to be—would such Schools and Model Farms produce general benefit to the country, proportioned to the expenditure that would be necessary for their establishment? The Directors think that they would, and that such establishments would, under judicious management, soon pay their own expenses, and be of incalculable benefit to Canadian farmers, and to the country generally, affording a suitable education, and practical instruction in the art of agriculture, to young farmers, and instructing labourers, or those who were to be dependent upon the wages of labour, in all the various works of the farm; and those again who would be educated and instructed at these establishments, teaching others throughout the country how to farm, and how to execute every farm work expertly and well. The Canadian farmers only require to be convinced, by practical demonstration, of the advantages of introducing a change in their system of agriculture, to insure their doing so in nine cases out of ten. On Model Farms

this can be properly demonstrated, and this would be one of their principal uses.

The Directors will feel much gratified if their management of the affairs of the Society is approved of by this meeting; and in retiring from this management, they would earnestly recommend the care of Canadian agriculture to their successors in office. There is much good expected to result from the action of this Society, and it would be matter for deep regret, should public expectation be disappointed.

A. N. MORIN,
President.

WM. EVANS,
Secretary.

Montreal, 24th March, 1849.

We have now in the Society's Library a most excellent work—"On The Cultivation of Flax; The Fattening of Cattle with Native Produce; Box Feeding and Summer Grazing," by John Warnes, Esq., presented to the Lower Canada Agricultural Society by Major Campbell, Civil Secretary. This book contains all the necessary information on the growing and subsequent management of flax, full report of the results of "Box Feeding" cattle, and the modes adopted for preparing the food. The cultivation of hemp is also described. There are plates of the machinery for breaking and scutching flax, plans of the boxes for stall-feeding cattle, and of several other implements. Indeed the book is a most valuable addition to the Library, if we only endeavour to practice what is so well described. We shall occasionally copy extracts from the work. The boxes for stall-feeding cattle would not be expensive. They are generally ten feet long eight feet wide and from six to seven feet high, and a hay loft might be over the stalls. There may be a double row with an alley between of from three to four feet wide, in a building of twenty-four to twenty-five feet wide. Hence in a building of forty-eight feet long and twenty-four feet wide there might be twelve boxes or stalls, and the upper part of the building be

employed for storing hay or straw, as the boxes need not be more than six to seven feet in height, and sunk a little below the floor.— This mode of housing cattle need not be very expensive over other modes. At most it is only a double stall or as much space allowed for one animal as is usually appropriated for two; and we have no doubt this additional expense would be compensated for in a short time, perhaps in one year by the better preservation of the dung, saving all the urine, and the quicker feeding of the animal, from its being so much more at ease than when confined to one position by a tie and a narrow stall. The machines for breaking and scutching flax are very simple, and would not be expensive. We hope the cultivation of flax and hemp will be commenced next spring, on a scale however small, to try what can be made of it. The necessary machinery is of course indispensable. We stated in a former number that it would not be prudent to displace the cultivation of other useful crops by introducing the cultivation of flax and hemp very extensively in the beginning. An experiment, however, should be tried to ascertain how these latter plants would succeed and pay. Those who would be disposed to make the experiment, we warn them not to attempt it, unless their soil is in a proper state of cultivation to produce a good crop of either flax or hemp, otherwise the experiment will not be a fair one, and by its unfavorable results will discourage the cultivation we recommend, and which we are convinced would succeed and pay well, if properly conducted.

An extensive farmer should cultivate such crops as by the use of suitable implements can be managed with the least expenditure of manual labour, for where more labour is concerned he will rarely be able to compete with the small cultivator, who executes such operations assiduously with the help of his family, and who, content with a small profit, offers his produce at such a low price as to leave no chance

of profit to the farmer who has to hire labour to do all his work. Those who have to hire labour should therefore adopt that system of agriculture that will be least likely to bring the produce he raises in competition with what is raised by the small farmer and his family. This can best be done by keeping cattle and sheep, raising food for fattening cattle, and such produce as can be sold for exportation. These are the products that large farmers and those who hire labour should raise here, if they desire to farm profitably. They should never sell roots, low priced grain or hay unless at a high price, but consume all these upon the farm. Beef, pork, mutton, wool, cheese, butter, wheat and barley, peas and beans, if at a fair price, should be the products sold from a large farm and from hired labour, and this might always be done. Low priced grain will pay much better, for to make beef or pork, than to sell it under a remunerating price, including a fair rent for the land, which is seldom taken into the estimate of the expenses of production here. We offer these suggestions in order that men who may engage in farming should adopt that system that would most probably not disappoint them. We can also assure them that the system we propose will be the most pleasing mode of farming and the most advantageous for the country. It is much better when capital is employed in any business that it should be safely invested and yield a fair return, than be wasted and yield no return, which has frequently happened by an injudicious system of agriculture and employing labour on what does not reimburse the expenditure.

We have seen lately in a Report of the English Wool Market, a recommendation to the wool growers of Australia, to be more careful to have the wool better washed, as much of it has come to England in a very dirty state, and thereby greatly depreciated in value. We also observed in their Report a recommendation to the keepers of sheep in New South

Wales, to increase the size and the weight of the fleece even at the expense of a degree of fineness of the wool—the Report stating that by doing so the wool growers would be much better paid, and find a readier market for the wool. We were surprised at this, because we understood that it was from extreme fineness and a peculiar felting quality, that Australia wool brought so high prices in England. It would appear from this that a large heavy fleece will pay much better than a small fine one, even when sheep are kept chiefly for their wool, as in New South Wales, where very little use is made of the carcase except to melt it down for grease. We have no doubt that a large heavy fleece of reasonable fineness would be much more profitable for us to grow than a light fine fleece. In growing large fleeces we should have competent wool sorters, who would separate the coarser parts of the fleece from the finer, and pack them separately for sale. By careful selecting in breeding, the coarser portions of the wool might be got rid of, and we could have sheep that would not grow much of the coarser quality of wool though a large fleece.

AGRICULTURAL REPORT FOR MARCH.

The month of March has been very moderate, and fine for the season. The snow has nearly disappeared from the fields, and should the weather continue moderate for a few days more, very little snow will remain. The season, however, is not so forward as many we have seen in Canada. We have sown wheat on the 1st, the 4th and the 7th of April, and we have had all our grain sown on one occasion on the 11th of that month. There is no probability of this being so early a season as any of these. Should the season, however, admit of sowing wheat before the 15th of April, we should recommend doing so. Wheat sown before the 15th or even the 20th may escape the fly. The most dangerous time of sowing is between the 15th or 20th of April and the 20th of May. As to all other agricul-

tural seeds, the sooner they are put into the soil after it is fit to work, the better—with the exception of Indian-corn, which it is not safe to plant before the 15th of May. Potatoes we would urge farmers to plant as early as possible, and not to apply farm-yard manure, if any other can be procured: ashes, lime, salt, charcoal, soot or compost manure will be the safest to employ with potatoes—and charcoal, we believe, will have a most beneficial effect, even a small quantity, put in the drill or hills. We have no doubt that we may raise potatoes by careful cultivation and early planting, and if we are not too covetous to raise large crops. To speculate on raising large and extensive crops of potatoes under our present total ignorance of the cause of their failure, or any certain remedy against the disease to which they are liable, is a great risk and such as no farmer should incur. Carrots, parsnips, and mangel-wurtzel may all be sown as soon as the soil is in a fit state to work, and the sooner these seeds can be put in the better. In our last year's *Journal* we have given the best modes we know for preparing the soil and putting in these seeds.—Mangel-wurtzel seed should be steeped in soft water for a day before it is sown; this will make it more sure to vegetate. We would strongly urge upon farmers the advantage of sowing these seeds, the two first particularly, as large and valuable crops of them may be raised more cheaply than potatoes, and they answer an excellent purpose for feeding horses, neat cattle, sheep or swine. Where recent manure is applied to grain crops, it should, if possible, be ploughed in, in preference to harrowing it in with the seed upon the surface. For oats or pease, however, sown broadcast, manure is put on as top-dressing with good effect, but we believe that in every case it would be better, if possible, to have it ploughed in.—Meadows that require it, should be top-dressed as early in April as the farmer can have the work done, without cutting up the surface with cart wheels. Top-dressing meadows and even pastures with suitable manure will pay well.

Compost, properly mixed and fermented, will answer best, and we would not recommend a very heavy dressing at one time, but rather apply it lightly and frequently. It is very necessary to attend carefully to cattle at this season of the year, and maintain them in good condition until they go to the pasture. Cattle very frequently are allowed to fall back in Canada about this time, and either die or become so exhausted for want of the necessary sustenance that they are a good part of the succeeding summer recovering what they lose, and not fit to give a profitable produce in milk or butter or in meat. Farmers, we know, are subject to great losses by this means, when such losses might be prevented by proper care, and without any material increase of expense. We have been often told it is useless to write about these matters, or recommend an improved system to farmers generally, as all we can write or speak on the subject will do no good. We, however, think differently, and feel convinced that the farmers of Canada in general are not more obstinately attached to defective systems of husbandry than the farmers of any other country, nor, perhaps so much; and we are perfectly satisfied, that by adopting proper means of information and instruction, the general system of agriculture might as certainly be improved here as in other countries, in proportion to the capital employed in husbandry.—The meadows should not be trespassed upon by cattle after the grass commences to vegetate, as it will materially diminish the produce of the crop of hay. All furrows and drains should be carefully attended to, and every obstruction to the free passage of the water off the soil be removed. This attention may enable the farmer to sow several days sooner than he otherwise would be able to do. As we have constantly endeavoured to prove—draining is the first of all improvements that should be effected by the farmer—and we can assure him the money and labour so applied, if judiciously expended, will pay as well as any other way he could employ it. We have had sufficient ex-

perience, both in the old country and in this, of the unprofitableness of farming or attempting to cultivate undrained lands, or land not sufficiently drained. We do not wish to be understood to say that no land can be profitably farmed or cultivated unless it is thoroughly drained by under-draining. This we know to be out of the power of most of our farmers.—But, until we are able to under-drain, we should endeavour to surface drain sufficiently, with the plough and the spade, which will answer a very good purpose until we can do more. In conclusion we wish farmers a good seed time, and the means of completing their spring work in the very best manner.—31st March.

We have been assured by a gentleman who has extensive water privileges that he would at once erect machinery for dressing flax and hemp, if he was certain that he could purchase these articles in sufficient quantity to employ machinery. This should be sufficient encouragement to cultivate these plants, as they would undoubtedly pay better, if properly cultivated, than any grain crop we raise at present. We fear, however, that no decided step will be taken in growing these plants until machinery is put up, and an advertisement appear offering a fair price for flax or hemp stacked in the field, dry and in good condition. The farmer to deliver the article in this state to the manufacturer at the manufactory, but without steeping or any other preparation. The flax will make a much better sample prepared by a certain process by the manufacturer, than by the various processes that would be adopted by every farmer preparing his own flax. If we attempt to grow flax or hemp, we must cultivate for them in a proper manner, and not as flax has been generally cultivated here.

We give insertion to a report of the organization of a new Agricultural Society at Quebec, and from the names and character of the Directors elected, we have no doubt of the success of the Society. We cannot have too many

Agricultural Societies, provided they are governed by liberal rules, and conducted upon the principle of promoting the improvement of agriculture where it is most required. The good cultivation of the land, and management of the crops, encouragement to a suitable stock of domestic animals, to good dairies, and to the general good management of farms and stock, so as to yield the greatest annual produce, should, we conceive, be the first objects for prizes with all Agricultural Societies. The prizes should also be so classed as to be open to farmers of the least pretensions, and encourage them to introduce improved cultivation. This might easily be done, if the general principle was once established that it is to farmers who most require improvement in their system of agriculture, that the encouragement and instruction of Agricultural Societies should be given first.— We beg to offer our acknowledgments to the Directors of the new Agricultural Society at Quebec for their favorable opinion of this Journal, and for subscribing for it. We also offer our thanks to several other Agricultural Societies who take a considerable number of copies for the members. This is the most satisfactory proof that could be given that this Journal is regarded with favour by those who are qualified to estimate its character. We have no other object, as editor, but that the Journal should be useful to every subscriber, and much more than compensate for the dollar annually paid for it. With the Quebec, and all other Agricultural Societies, we shall most cheerfully co-operate, in every possible way to advance the improvement and prosperity of Canadian husbandry.

We frequently hear it objected that farmers have not the means here to introduce a very improved system of agriculture, and that we are not justified in recommending the improvements introduced lately in the British Isles, as farmers here cannot adopt them. We are very cautious in recommending improvements, except such as may be adopted here profitably.

We may as well remain idle as to be cultivating land in such a slovenly manner that it is impossible for it to produce good crops. A most material improvement might be introduced in our agriculture with no great additional increase of the expense to that we incur by our present defective system. Farmers without hesitation object to what is proposed to them before they take the trouble of making any trial of what is proposed. We would not attempt to propose very expensive modes of cultivation to farmers unless in cases that we were sure would pay well. We may occasionally give the modes of cultivating crops in other countries, but we often do this without recommending their modes to farmers here. So far as good ploughing, harrowing, manuring, sowing good seed and keeping the crops clean from weeds, all these require to be as well done here as in any other country, if we expect to raise profitable crops. As to the keeping of domestic animals, their quality and profit will depend upon the improvement of our lands and means of keeping those animals, and we have constantly endeavored to convince farmers of this.

The Lower Canada Agricultural Society have had their Second Annual General Meeting, since their organization, and although their funds did not admit of their carrying out all the objects of their organization, they look forward to the period as not very distant when they shall be able to accomplish their object. They have already done much towards promoting a spirit of improvement where it was most required. This Society is desirous of being in reality, as well as in name, the "Agricultural Society of Lower Canada," not interfering with the local Societies, but following the even tenor of the way they first proposed, namely, to endeavour to promote the *general* improvement of Canadian Agriculture, not in one or more particular localities, but to the remotest limits, and to every portion of the Province, the Eastern in particular. Their motto is "The General Improvement of Canadian Agri-

culture;" and they propose to act consistently upon this principle; and they will only expect support so far as they are found to follow this rule. The Society occupy a position that may be of the greatest importance to the welfare of the country, and if they do not obtain the support necessary to the carrying out of their patriotic and disinterested views, the blame will attach to others and not to them. There cannot be any mistake in regard to the object and views of this Society, that they are calculated to promote the real welfare of this Province; and it is not from ignorance or doubt of this being the fact, that support will be withheld from them. There are, we are happy to be able to say, several staunch supporters of the Society, whose names it might not be proper for us to give: one gentleman at the last annual meeting, although a life member, and one of the first who became so, handed us ten dollars as an additional donation to the Society's funds. Another gentleman has advanced a considerable amount towards the establishment of this Society in these rooms. A list of life and annual members shall soon be published. We have endeavoured to put this matter fairly before the public, in order that they may be able to estimate correctly the grounds upon which the Lower Canada Agricultural Society expect support.

The spring will probably have commenced, and the work made considerable progress, before the next number of the Journal will be published. We would, therefore, urge upon farmers not to allow a moment to elapse that might be usefully employed in putting in the seed in the soil when in a fit state. Oats may be, and should be, sown the instant the soil is fit to harrow—so should pease and beans, if we desire good crops. In preparing any of these seeds, oats in particular, they should be run through the fanners until every light and inferior grain is taken out. There is no loss to the farmer by doing this, as the light grain may be fed to his cattle. This will be much more

profitable than to sow light or inferior seed.—Beans and pease have, very frequently, many seeds that will not vegetate, and all these should be separated from the seed to be sown. If this is not done, the farmer subsequently finds that the crop does not come up well, and attributes this to other causes rather than his own neglect in not sowing seed that was sound and would vegetate. We have frequently seen seed sown here that had a large proportion of light and useless grains mixed with it, that never could grow, or if it did, produce a good crop. When a farmer has his land well prepared, it is a great loss to sow it with imperfect or inferior seed. In the "Agricultural Journal" for last year, we described the most approved modes of sowing beans, and therefore it would be needless to repeat them here. The more carefully the land is cultivated and the seed put in, the more probability there will be that a good crop will result—provided always, that after culture will be attended to and weeds kept down. Pease, we would recommend to be sown in drills, if possible, and with a little trouble this might be done, on any land that is near being cultivated as it ought. Oats does not require so careful cultivation. If the land is fertile, well ploughed and drained, and good seed sown and well harrowed in, there is every chance of a good crop. When sown after grass, we have always found it a good plan to run the plough two or three times in the furrows, and then a drill harrow to break the mould, and shovel the loose soil of the furrows over the ridges. This will cover the seed, close the soil, and improve the crop.

We have frequently stated the advantages to the farmer of well trained labour, cheerfully and faithfully given, when hired; and the great drawback it must be to him when the contrary is the case, and the labour unskilfully executed and reluctantly rendered. These matters have a vast influence in making farming profitable or otherwise to those who employ labour. If labour on the farm is unskilfully

executed it involves a double loss. We have known instances where the loss occasioned by these causes were so great as to be incredible except by actual experience. These facts make it of so much importance to have trained labourers; indeed it is of more importance in agriculture than in any other business. We advocate Model Farms as one means of obtaining skilful labourers. It is, however, of little consequence to advocate them, if no further action is taken in the matter. It is a very deplorable state of affairs when we cannot employ the means that would be calculated to improve our condition. Agriculture is necessary for Canada, and if it is, the more successfully it is carried on, and the larger the quantity and value of its products, the greater advantage it will be to the country. Our agriculture, we hesitate not to say, should be the first and principal object of careful solicitude to every true friend to this country,—and we say further, that this country can never be in a prosperous condition while her agriculture remains unimproved and in a languishing state, yielding less than half a reasonable average produce, and this produce selling at a very low price. If we are mistaken on this subject, we beg we may be corrected, as it is a subject of importance to every inhabitant of Canada. It is, we humbly conceive, in vain to expect an improved condition of affairs while the main source of our prosperity remains neglected. We might as well expect that a tree would yield abundant fruit while the root of it was neglected and in a state of decay. It is to advance the interests, the improvement and prosperity, of Canadian Agriculture, this Journal is published; and we should be wanting in our duty to those who have confided its management to us, if we did not point out, so far as we can understand the matter, what we conceive would be the certain means to advance the interests of Agriculture and promote general prosperity.

Some persons consider peas to be the best preparation for wheat; others, on the contrary,

prefer beans. The latter absorb more nourishment from the soil than the former, because they generally produce a greater bulk of crop. Where the soil is rich enough to furnish the requisite nourishment for the crop, beans will be found an excellent preparation for wheat. Summer fallow, however, will, we believe, be found a better preparation for wheat, if the work has been properly executed, than any other. We would recommend that every farmer who has his soil in a suitable state of cultivation should endeavour to cover the seed sufficiently and at a uniform depth, two inches at least. This might be done without a regular corn-drill, by making small drills with the plough without the mould-board, and with one horse. The seed might then be sown, and the harrow would bring most of the seed into the drills. A great cause of the weakness of the straw and the large proportion of stunted ears of wheat, is the superficial manner of sowing wheat, generally adopted in this country. This mode of sowing might be very profitably adopted with peas and barley also as well as wheat, where the soil is in proper condition. It might be necessary to sow at a more early period when sowing in drills than when sowing in the ordinary way; but this must be determined by the farmer's own experience. A small machine might be constructed for forming small drills for the seed until we could afford to have the regular corn-drill and use it. Our lands are not yet sufficiently drained and cultivated to admit of the use of the English corn-drill, and were we to have a simple machine for forming drills the seed might be sown broad cast and then harrowed in, and most of the seed would fall into the drills. If the crop was not subsequently hoed the seed would, at all events, be sufficiently covered, and this would be a great advantage. We recommend this subject to the consideration of agriculturists who may adopt some plan to effect the purpose we suggest better than the one we propose.

We are rejoiced to hear that our Ship Canals are likely to be completed on the scale that was first proposed, and when this is done, we will have a water communication unequalled on earth, and extending into a fine country a distance of near two thousand miles from the sea. We have always advocated this improvement, as it appeared to us to be one of the first that should have been executed after the settlement of the country, to open up the vast shores of the great lakes and rivers of this noble country to navigation and settlement. The resources of the country hitherto have been locked up in a great measure, or at all events, the products of the country could not be transported to shipping ports but at an expense almost equal to their entire value, which must have acted as a bar to improvement and production. In future it will not be so. Vessels of perhaps one thousand tons burden will be able to navigate our waters to Lake Superior when the proposed improvements of the Canals are completed. Of course these large vessels must be so constructed as to suit inland navigation. We anticipate the most favourable results from all these improvements, and we have no doubt that the whole Province and the Empire at large will derive immense advantage from these water communications. The debt incurred for their construction will not be a burden on the people of the Province as many anticipated, but on the contrary will soon be refunded, if we only avail ourselves of our position. As a farmer, we only value these means of internal communications as they afford encouragement to the improvement of Canadian Agriculture, convinced as we are that it is the products of our own country that must form the only certain basis of our wealth and prosperity, that we never can be deprived of. These Ship Canals will greatly diminish the cost of transport inwards and outwards, and hence increase the actual value of agricultural products in two ways—giving the farmer a higher price for what he has to sell, and diminishing the cost of what he may have to purchase. It

must ever be a great benefit to any country that the expense of transporting what it has to sell and to purchase should be as low as possible, so as to admit the application of all the disposable capital, whether money or labour, to improvement and production. These matters are not sufficiently studied when we cry out against the expenses of Canals, Rail-roads, &c. The farmers are deeply interested in this question, more than any other class of the community, and they now have an opportunity to augment their productions so as to give employment in proportion to the means in their power, to Canadian Canals and Rail-roads. There is another circumstance regarding the expenditure upon necessary and useful improvements we should never forget, that is, that the capital expended is not lost. No, not one shilling of it, but all goes into the most profitable channels of circulation for future production, to the general benefit of the country.

The Finance Committee of the Royal English Agricultural Society, in a Report lately made to the Council of the Society, has the following passage:—"It appearing that the Journal is a principal inducement to the agricultural public to join the Society and to keep the subscriptions paid up, the Finance Committee are of opinion that it would prove advantageous if the Council would increase the price of the future Journals to ten shillings each part for all non-members of the Society." This recommendation was unanimously adopted. It appears from the above how highly the Journal of the Society is thought of and prized by English farmers, where the very best farming is in practice before their eyes in every parish of the country. The English agriculturist, however well informed, has too much good sense not to read and study any suggestions or information referring to his business, that is placed in his power to purchase for a few shillings. How different it is here! Canadian farmers will not generally subscribe five shillings annually to an agricultural Journal, It

even to encourage such a publication in their own country. We do not know what to attribute this to. It cannot be from a motive of saving five shillings a year, because we are convinced that any farmer, however well instructed in his profession, could not employ a dollar more beneficially for himself, than by subscribing for this or any other agricultural Journal for a year. There is much useful information contained in an Agricultural Journal, that is not generally known to farmers, however competent they may be.

We hope that farmers will not be discouraged, by the present low prices of produce, from doing all in their power to raise good crops. The only way we can successfully meet low prices is by raising a large and excellent produce, and employing it judiciously and to the greatest advantage—manufacturing the root crops and inferior grain into beef and pork, and making good cheese and butter from a proper proportion of our land, kept in pasture for that purpose. American cheese and butter of good quality bring very fair prices in the English market, and will always be likely to do so. We must also endeavour to have customers of our own for some of our produce, who may exchange their manufactures for that of the farmers. Whatever may be the present prices of our grain, it is perfectly certain the chief hope for the future is in the improvement of our entire system of Agriculture, and the augmentation of our produce in quantity and value. This will give new life and activity to commerce, to manufactures of our own, and will act beneficially upon every business and interest in the Province. We have resources within our own power that, worked judiciously, may ensure our prosperous condition; and it is absurd to expect to improve the general condition of the country from any other than our own resources, and the grand and principal resource is the naturally fertile soil of Canada. This may be made a mine of wealth, that would be much more valuable than mines of

gold and silver, and produce a thousand-fold more of true comfort and happiness to the people of the country. We may look forward to a period that shall find a good market for cattle and horses in the adjoining States—and even now, had we been more careful of our breed of horses, we might find sale for many thousand horses at high prices, in addition to those that have been purchased this year for that country. This is not a groundless expectation: there is scarcely a doubt that if we have good cattle and horses to dispose of, they will, before many years, find a good market in the United States. Notwithstanding their vast territory, their population will increase in proportion, and horses and cattle cannot be raised in the wild forests.

This number of the Journal was ready for publication when we received the excellent and practical communication of "Triptolemus;" we give it insertion with the greatest pleasure, and shall be happy to hear again from so able a correspondent. We entertain the same views as our correspondent; but we would not have ventured to express them so decidedly, lest our doing so should be attributed to improper motives on our part. We hope the suggestions contained in this well-written communication will have all the influence they are entitled to. For the compliment paid to our humble exertions, we return our most grateful acknowledgments. It is certainly an encouragement to have our conduct commended by such a writer as "Triptolemus."

Mr. Fleck exhibited several Agricultural Implements at the seedstore of Mr. Shepherd of the best description and workmanship, equal to any that could be imported. His Cheese-press is upon an excellent plan, and it will not certainly be the fault of the Press, if the cheese pressed in it is not good. Mr. Fleck promises to manufacture and exhibit several more implements, and we wish him every success, as an Implement maker.

We beg to direct attention to the advertisement in this number of George Vail, Esquire, of Troy, State of New York, who proposes to sell several superior animals of the short-horn breed of English cattle, originally purchased from Mr. Bates, of England, who was well known as having the very best breed of those cattle. We have not had an opportunity of seeing Mr. Vail's stock, but we have heard them spoken of in the highest terms; and from the picture of a Durham cow (which appears in the Transactions of the York State Agricultural Society for 1847), belonging to Mr. Vail, we must think highly of the stock offered for sale. It affords a very favourable opportunity to any person wishing to purchase animals of the pure Durham breed, to apply to Mr. Vail, as, in all probability, they can be purchased from that gentleman on much more favourable terms than in England, including the cost of importation.

One Agricultural Society alone has purchased 1,000 lbs. of the foreign clover seed imported by Mr. Shepherd this year, or nearly one-sixth of the whole. Many other Societies have also purchased these and other seeds for distribution. There are several excellent samples of wheat, barley, pease, beans, oats, &c., sent to Mr. Shepherd's by agriculturists who have raised them, and thus affording persons requiring to purchase seed, a favourable opportunity to obtain what is most suitable for their soils, when they can be informed of the quality of the soil upon which the sample was grown.

DIRECTIONS FOR PROPERLY SOWING CORN AND OTHER SEEDS.

BY DR. H. W. DEWHURST, F. R. A. S.

SOWING is one of the principal processes of the cultivator; it is performed in various ways—viz., broad-casting, dibbling, or drilling. In broad-casting, the seed is most commonly sown on the seed furrow, and no care is, or can be taken regulating the depth of the seeds except only as happens from the action of the implements employed. The plough leaves a furrowed surface,

and when the seed is thrown over, it falls exactly in the creases between the furrows, and at unequal depths, before it is covered by the harrows. From this circumstance the seedlings rise unequally, both as to time and inter-distances, being too thick in the creases and too thin, or entirely absent on the backs of the furrows. This circumstance is particularly visible in fields of lea wheat, and hence arises a diminished crop; it was a defect in the method of sowing which could not be overlooked by the intelligent farmer; hence the invention of machines for drilling in the seed, which was attended by several advantages—viz., a more equal distribution of the seed; by which a portion was saved; laying in the seed at a proper depth, and giving facility to the operations of the hand-hoer in the spring. By means of the machine the seed is deposited and covered with a light harrow attached, or by a set of harrows to follow; the plants rise regularly, and ripen, as well as an equally regular sample of grain. Thus the great advantage of drilling consists in laying the seeds at a proper depth, the machine being so constructed as to go deeper or shallower at the option of the sower. Dibbling corn, such as wheat and beans, is another plan by which a portion of seed is saved, and the rest is placed in the soil at a proper depth; and, moreover, dibbling is particularly necessary on tender land, which can admit of but very little trampling of horses or the labour of the harrows, a very slight movement of the surface being sufficient in both cases.

There are, however, many farmers who use neither drills nor dibblers, and yet are equally successful if their land is sufficiently firm and dry at seed-time, so that they can only obtain *one inch* of loose mould upon the surface by the action of the harrows. On such a surface a good broadcast seedsman will seed the land so regularly that every square inch shall bear its plant without gaps and without crowding; by which regularity of plant, each standing as it were insulated, the whole will rise in close order, so that the whole surface is occupied; each plant is allowed to tiller, according as the land is more or less rich; no thin places to encourage over luxuriant growth, and probably mildew; nor anywhere so thick as to cause a hurtful rivalry among each other.

There is a proper distance at which wheat plants, as well as those of all other sorts of corn, should stand, in order to arrive at full perfection. We not only want a heavy, but, moreover, a fair standing crop. It is necessary that corn should grow up in close order, to shade, shelter, and support each other's stems. If wheat, for example, were dibbled in at 12 inch distances, the crop would be neither a standing, nor a profitable one; the plants would be individually strong, well tillered, and vigo-

rous, but, wanting lateral support and shelter, would, most likely, fall to the ground and be mildewed. On the other hand, if sown too quickly, the plants rob each other; the straw is slender and weak; and the grain is, of course, thin and light. Plants of a medium strength yield the finest straw and heaviest grain; and were it possible to distribute the seed at about one inch and a half distances upon good ground, and each producing four tillers, the crops would appear like a solid mass of straw and ears at harvest. A thick, rather than a thin standing crop, is always the most profitable. If very rich land be thickly seeded, the numbers pressing on each other prevent any portion of the crop becoming over luxuriant, the plants reciprocally equalizing each other; and, if very poor land is sown, it also should be well-seeded; because the poverty of the soil prevents all thickening from tillers; consequently, the best possible crop is reaped from sowing thickly upon poor land.

Drilling is a means by which two and a half bushels of wheat or barley can be deposited very equally over an acre of land, although not equally over the surface. The plants in the drills stand rather too closely together, and the spaces between are without plants; and though there can be no doubt, that if the supernumeraries in the drills stood in the spaces between, the whole would be a more regular and abundant crop, yet, it must be admitted, that drilling is the most eligible method of sowing, and far more precise than it could be done, or as it often is, at random.

But where no drill is employed, broadcasting must be practised, and if the surface is properly prepared, experienced seedsmen will strew the seed with the utmost regularity. The ground must be prepared, by being previously harrowed down; and whether lea or fallow, all marks of the plough must be obliterated. The furrows of leas are frequently extremely tough, and not easily harrowed to raise a sufficiency of loose mould to receive the seed, unless the lea has been ploughed with a thin coulter, and well rolled before the short-tined harrows are put on to raise the requisite depth of mould. But however tough the furrows may be, the labours of the harrows must be continued until the surface is thoroughly comminuted.

This previous preparation of the surface is of much importance; it secures an equal plant (supposing the seed to have been carefully sown) over the whole surface, and about one bout of the harrow will heal it sufficiently—that is, about one inch below the surface, the true depth at which all corn should be covered.

It is hardly necessary to state, that the wheat plant is supported by two sets of roots, which are distinguished by the appellations of *seminal* and *coronal*. The former are produced immediately from the seed, at whatever moderate depth it

may chance to be buried in the soil. The infant stem rises from the centre of these first roots, its lower joint being lengthened to within half an inch of the surface, where the second joint begins to be formed, and from which the two first leaves are developed above ground. The place of these first leaves is called the crown of the plant; hence the strong, fibrous roots which afterwards proceed from the crown are called *coronals*. These are produced in the spring, and are the roots which principally assist to carry on the plant to maturity. Soon as the coronal roots come in action, the seminal, together with the slender pipe attached to them, wither and die away, they no longer being useful to the plant. This, then, is the manner of the development of a wheat plant, the seed of which was buried too deeply in the ground; and though nature attains her end, by lengthening the first joint up to the proper station, it is an unnecessary expense of power, which might have been saved, had the seed been laid in its proper place at first.

It is for this reason, and to prevent any seed being too deeply buried, that the labour of harrowing down after the plough is so necessary a process. A uniform surface is necessary for the drill, as well as broadcast; and in the latter case the seed is uniformly and equally buried by the harrows—that is, not more than one inch under the surface. At this depth both sets of roots are near together, and the plants rise and progress more vigorously. In sowing barley, it is an old custom to sow one cast before, and another after the harrow, but it would certainly be better to sow both casts after the surface has been harrowed down.

For small seeds, such as turnips, clover, and grass, the seeds can hardly be too thinly covered; of course the surface should be made perfectly level by the harrows, to receive the seeds, and, when sown, the bush-harrow and roller cover it sufficiently; unless, indeed, the surface be in the state of dry dust, in which case short-tined harrows might be requisite, to let in the seeds a little deeper.

I have stated above, that the wheat plant is perfected by two sets of roots; this is the truth, but it is not all the truth; for the wheat plant, like all others, has jointed stems, and may have, instead of two, several distinct sets of roots; for not only do fibrous roots proceed from the first and second joints, as already stated, but from the third and fourth also; in fact, every tiller ejects its own radicles, whether they arise from the second or third joints of the stem, and more especially, if by rolling in the spring, the plants are in some measure earthed up.

The purport of the above observations is, to impress upon the agriculturist the absolute necessity of always harrowing the surface of the soil before the sower, except only in the case of dibbling, when harrowing may be dispensed

with until the surface is thoroughly dry in the spring.

ON THE PREPARATION OF THE FOOD OF CATTLE.

At the recent Smithfield Cattle Show, I promised to afford early and definite information relative to an experiment at Trimmingham between eight Scots, one-half fed with boiled linseed, the other with raw.

Assured that you will readily afford the medium of your paper, I beg to state, that the bullocks, after three months' feeding, were submitted to public inspection at North Walsham, on Thursday last, and that the superiority was awarded to the raw fed, by a great majority of farmers.

But, admitting the fattening properties of both systems to be equal, the cold must possess the greater advantages:—1st, because firing is dispensed with,—2ndly, because the mixture does not turn sour,—and 3rdly, because the cattle eat it without waste.

It is my intention to continue the experiment until the animals are ready for market, but with respect to the rest of my cattle, I shall substitute the cold for the hot food.

The object of either process is to form the linseed into gelatine, and to incorporate it with any substance, or fibrous material, that will act as a vehicle to the stomach, and as a reconveyance to the mouth for rumination.

Gelatine, proper for cattle feeding, is obtained either by boiling linseed reduced to fine meal 5 or 10 minutes; or by soaking it 25 or 30 hours in cold water.

The method of making the cold compound with which the bullocks in question are fed, is precisely the same as that described for hot in page 234 first edition of my book, and in 245 of the second, viz:—

The half of a large tub being conveniently placed, a bushel of pea-straw, &c., or hay and turnip tops cut into chaff, is put in. Two or three hand-cups-full of the jelly are poured upon it, and stirred up with a three-pronged fork. Another bushel of the turnip-tops, chaff, &c., is next added, and two or three cups of the gelatine as before; all of which are then expeditiously stirred and worked together with the fork, and a rammer. It is then pressed down as firmly as the nature of the mixture will allow, with the latter instrument, which completes the first layer. Similar quantities of the turnip-top-chaff, &c., are thrown into the tub, the jelly poured upon it, and so on till the copper or vessel in which the gelatine was formed, is emptied. The mass is lastly pressed down with a copper lid, and in a few hours, the chaff having absorbed the mucilage, the compound is given to the cattle three or four times in addition to as many turnips as they like to eat. The proportion, up to this date, has been one pailful of linseed meal to eight

of water. Next month it will be one to seven, with about two pints of barley or pea-meal added by degrees while the compound is being made. Afterwards more linseed and barley will be used. By this means the present cost of eighteen-pence a head per week for the artificial ingredients will be increased to about half-a-crown.

In adhering to these regulations I have never failed to obtain ample remuneration for grazing, independent of the box manure which is beyond price.

I exhibited also at North Walsham, a Dutch heifer that cost £8 10s. a short time before last Christmas. She was fed according to the above system, at the rate of two shillings and three-pence per week for linseed till June, when an unlimited quantity, compounded with grass, pulse, grain or turnips was daily placed before her. During this time, however, she consumed on the average only 20 pints of linseed, and 35 of barley or peas per week, the value of which was £4 16s. This sum added to £2 14s. for the previous six months' compound, amounts altogether to £7 10s. for the year.

The heifer is considered to weigh about 70 stones of 14lbs. Three weeks since I refused £30 for her. On Thursday last £29 were only offered. Taking the latter sum as the criterion of value, and deducting the original cost leaves £20 10s. for twelve months' maintenance upon the exclusive produce of the farm, besides the manure, which, I repeat, is beyond price.

To prevent misunderstandings, I think it right to state, that the heifer never had a calf, and that she was one of six purchased at £8 10s. each. They were equal as to size and breeding. One died, and the others were sold at the end of six months for £19 each. Therefore, had this heifer been then disposed of, she also would have repaid £10 10s., whereas, by retaining her six months longer, her value only increased £10, though at an extra cost of £2 2s. for compounds.

It will be seen that the heifer repaid £2 2s. less for the last half-year than for the former. We may, therefore, reasonably expect, that if kept another half-year, a proportional decrease would occur. Depending, however, upon the economy of the system, and believing that a net profit will be obtained from the present value of £29, I intend to exhibit her at Norwich during the meeting of the Royal Agricultural Society in July, as a powerful illustration of the advantages derived from "*fattening cattle with native, instead of foreign produce.*"

The weight of the heifer in June was estimated, with the others, at 54 stone of 14lbs.—now at 70. Then the price was calculated at 7s.—now at 8s. 3d. per stone. Therefore, had not the worth of the meat been increased, loss, instead of gain must have been noted; and as the increase is only 16 stones or 10lbs. per week, some idea may be formed of the loss sustained in rearing and fattening cattle for Christmas shows,

and prizes, at ten, fifteen or twenty shillings per week, for oil-cake, &c., &c.

I have published many similar returns to the above, and know from experience that the quickest generally prove the most profitable. But in the present instance, I desired to shew, that foreigners possess cattle equally prone to fatten with our own;—that meat can be raised from linseed compounds at one third less than the cost for cake; and that through the growth of linseed, with summer and winter feeding in boxes, nearly all the expenditure throughout the country for artificial manure, and for cattle food, might be avoided.

It can scarcely be necessary to remind the British farmer of his position with respect to foreign competition; and of his sure destruction unless he strikes into new and improved paths. Lethargy, prejudice, and antiquated notions, must give way to a vigorous exercise of common sense. The requisites for rearing, feeding, and fattening cattle must be grown at home,—manure be economised,—and employment be afforded to the weaker portion of the population, which can all be mainly secured through the cultivation of flax, use of the seed, and summer, as well as winter feeding in boxes.

As a further proof of the great utility of the system, I will just state, that I sold lately a fat yearling heifer for £12, and sent two others equally so to the North Walsham exhibition, worth more than the average of three-year-old store stock.

If incentives were wanting to the adoption of my plan, the fact that 22,473,233 qrs. of grain, 510,337 head of cattle, and 1,268,040 cwts. of provisions were imported from the 1st of January, 1846, to November 5th, 1848, ought to stimulate us at least to attempt to stem the approaching tide.—*John Warner, Trimmingham, Norfolk, December 16th, 1848.*

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Will you be kind enough to state your opinion, in your next publication, upon the following questions, viz. :—

Is lime-stone, when ground into a powder, as good manure as lime-stone calcined?

Would ground lime-stone, laid upon land without any mixture whatever, be at all *beneficial*?

Do you consider ground lime-stone a manure at all?

By noticing the above, you will oblige yours,
A TILLER OF LAND.

Lancaster, Dec. 20, 1848.

REPLY.

Before lime or lime-stone (carbonate of lime) can act with the greatest effect on the soil, it is necessary that it attain a state of minute divi-

sion. The chief use of burning lime-stone into lime is to effect this division by the gradual *slaking* of the lime in the air. After the lime has been exposed some time to atmospheric action it resumes its original state of carbonate of lime; but this carbonate is now capable of acting much more efficiently on the soil than powdered lime-stone, because no mechanical action can ever reduce lime-stone to such minute particles as the chemical action of slaking.

The hard crystalline lime-stones of the north and west of England would not be so efficient as the softer chalk of the south-east of England. Some of the latter, in fact, when acted upon by a sharp frost, become reduced to a powder, almost equal in fineness to that from lime.

Lime not only has a considerable action on the soil, but being one of the constituents of plants, is itself, to a certain extent, a manure. It must not be forgotten that few lime-stones are absolutely pure, and that different specimens contain variable amounts of other valuable ingredients, upon whose presence or absence, in fact, the value of different lime-stones in a great measure depends.

Powdered lime-stone would undoubtedly do good on land requiring lime; but it would have to be administered in much larger doses than lime, to produce the same effect.

With reference to the economic application of lime, another thing is worthy of remark. From 52 to 56 tons of lime-stone burn to 28 of lime. If the sources of the chalk or lime lie at various distances, it will often be merely a question of the expense of cartage, for the 28 tons of lime will, when put on the land, speedily reabsorb carbonic acid and moisture, and attain the original weight.

Fifty tons of pure dry lime-stone contain 28 of lime and 22 of carbonic acid, or, reduced to original elements, 50 tons of lime-stone contain 20 tons of the metal calcium, 24 tons of oxygen, and 6 tons of charcoal or carbon.

I am, Sir, yours truly,

J. C. NESBIT.

*Scientific and Agricultural School, Kennington,
Jan. 17, 1849.*

PORTABLE RAILWAY.—Dr. Spurgin favoured the Council with the inspection of a model for a rotary railway, on the principle of the simple roller, for use on farms, docks, warehouses, and other places where heavy weights were to be conveyed short distances without the aid of horse-power; as manure from yards, corn from stack-yards, timber from woods, turnips or mangel wurzel from flat heavy land. He considered that this mode of conveyance would prove, in these and similar cases, fully efficient in its action; particularly as it would combine great simplicity with ready adaptability for the purposes required, at a cost not exceeding £10.

THE SMOKE NUISANCE.—The loss to the public, from excess of washing, &c., which a smoky atmosphere renders necessary, is more than at first sight might appear. Dr. Lyon Playfair has shown that in this one item Manchester has been expending £60,000 a year, and that if the expense of additional painting and whitewashing be added, the actual money loss would be double the amount of the poor rates every year. The Rev. Mr. Clay states that, in Preston only two furnaces consume their smoke, and even that imperfectly; but were all the factories in the town to do as much, the public would save £10,450 a year in extra washing.—*Health of Towns Journal.*

**SHORT-HORN DURHAM CATTLE,
AT AUCTION.**

THE Subscriber being about to dispose of 50 acres of his grazing farm for public purposes, will offer at public sale 30 head of **SHORT-HORN DURHAM CATTLE** (being about one-half of his present herd), at his farm 2½ miles from the City, on the 13th day of June next, at **ELEVEN** o'clock in the forenoon, consisting of yearling, two year and three year old Heifers and Cows; and eleven young **BULLS** from ten months to two and a half years old. Great care has been observed, and considerable expence incurred, in selecting and breeding this stock with reference to purity of blood and dairy qualities.

The awards of the New York State Agricultural Society, and the New York American Institute attest the estimation in which this stock is held wherever it has been exhibited for competition. About eight head of the above cattle are a purchase made from E. P. Prentice, Esq., of Albany, last May. Being all the Short-horns of that gentleman, and the products of his four selected cows, retained at his public sales, these latter animals possess the strain of blood of the herd of Mr. Witaker of England, from whom Mr. Prentice made his principal importation. The other portion of the young animals partake largely of the blood of the celebrated herd of Thomas Bates, Esq., of Yorkshire, England, from whom my importations have been derived. They are mostly of the get of my imported Bulls, Duke of Wellington and premium Bull Meteor. The Heifers and Cows are and will mostly be in calf by the latter Bulls.

For the information of such as may doubt the successful propagation of this valuable breed of Cattle in a warmer climate, I introduce here an extract of a letter I received from A. G. Summer, Esq., Editor of the South Carolinian, dated Columbia, 25th January, 1849:—"The Bull you sold Colonel Hampton of this State, gives him great satisfaction; he is a fine animal, and I only wish you could see some twenty head of his get now in his yard. They are the most superior Yearlings ever bred in the South." The pedigree of this stock will be issued one month previous to the sale. A credit of six to eighteen months will be given on the stock.

GEORGE VAIL.

Troy, N. Y., April 2, 1849.

**GUILBAULT'S
BOTANIC & COMMERCIAL GARDEN,**

Cote des Neiges, adjoining the Chapel.

THE Proprietors of this Establishment invite Public attention to their large assortment of every description of **FRUIT & FOREST TREES, ORNAMENTAL SHRUBS, ROSES, DAHLIAS, GREEN HOUSE PLANTS, &c., &c.**, which they will sell cheap for cash or approved credit.

Orders left with Messrs. S. J. Lyman & Co., Place d'Armes, or J. E. Guilbault, Cote des Neiges, will receive punctual attention.

Please call and visit the Establishment so as to judge for yourself.

TO AMATEURS OF POULTRY AND PIGEONS.

THE Proprietors of **GUILBAULT'S BOTANIC and COMMERCIAL GARDEN** have the pleasure to acquaint the Public, that they have completed their collection of Poultry and Pigeons, the collection being the rarest ever seen in America. Persons desirous of procuring some of them will please order now or inscribe their name, specifying the sort. The first ordered, the first served.

FOWLS:—

- Pure White Top Knot,
- Black Poland or Top Knot,
- Silver Pheasant Top Knot,
- Golden Pheasant Top Knot,
- Malay Breed,
- English Dorking,
- Creole or Bolton Grey,
- Buck's County Fowls,
- Game of *Finn Breed*,
- Iroquoise or Rump,
- True *Cochin China*, the pride of England,
- Santa Anna or Gofelue,
- Pure White Bantam,
- French Bantam,
- Sir John Sebright Golden Bantam, Clean Legs.

GEESE AND DUCKS:—

- Brement Geese, weighing over 20lb. each,
- Chinese Geese—Wild Geese,
- Muscovy Duck,
- Aylesbury White Duck,
- Pure White Top Knot Duck,
- Black Top Knot Duck,
- Rhone Duck, large,
- White Turkey, pure,
- Guinea Hen,
- Peacock.

PIGEONS:—

- Fan-tail, pure white and others,
- Powder,
- Fyille or Jacobin,
- Nun's—Magpie—Gull,
- Trumpeter,
- Egyptian,
- Cinemon Tumbler,
- Deep Red do
- Blue Baldhead do
- Almond do scarce,
- Kite do
- Black Baldhead do
- Spashed do

They are warranted Pure Breed.

The collection can be seen any time after 1st May.

FARMING IMPLEMENTS.

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

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

M. J. HAYS, Cote St. Antoine,
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TO THE AGRICULTURISTS OF CANADA.

SCOTCH PLOUGHS, &c.

ALEXANDER FLECK, BLACKSMITH, St. Peter Street, has on hand and offers for Sale SCOTCH PLOUGHS, made from WILKIE & GRAY's Pattern, of a superior quality and workmanship, warranted equal to any imported.

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DRILL PLOUGHS, SCUFFLERS & DRILL HARROWS, of the most approved and latest patterns, and CHEESE PRESSES of the Ayrshire pattern.

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March 1, 1849.

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

MATTHEW MOODY, Manufacturer.

Terrebonne, July, 1848.

NEW SEED STORE.

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

OPENED HIS SEED STORE,

At No. 25, Notre Dame Street, Opposite the City Hall,

Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

P. S.—An excellent assortment of Fruit Trees, particularly Apples, which he will dispose of at one-fourth less than the usual prices. Also, a large quantity of fresh foreign Clover Seed.
Montreal, April 1849.

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