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# AGRICULTURAL JOURNAL,

AND

## TRANSACTIONS

OF THE

### Lower Canada Agricultural Society.

VOL. 9.

MONTREAL, SEPTEMBER, 1880.

NO. 9.

The Legislature have granted £2000 for the Industrial Exhibition which is to take place in Montreal in October next, and the Government have named Commissioners to superintend and manage the Exhibition. This is all as it should be, and we may expect to have an Exhibition worthy of Canada. So far as regards the products of Agriculture, we may be able to show some specimens equal, if not superior to those produced in any country. In a former number, we stated that no country could produce so fine a sample of hay as Canada, and this is one of the most valuable products of the farm. Our samples of grain may be very good, and we could compete, perhaps, with the grain of many other countries, but we feel persuaded that the samples of English grain will be superior to any that will appear at the great English Exhibition. Canadian peas might compete with those of any country. We can also raise good root crops, but in the British Isles, they raise better root crops, we believe, than in any part of the world. The soil and climate are favourable, and the cultivation, manuring, and management are superior to that of any country. There is most excellent butter made here, and we have seen cheese of Canadian manufacture, as good as any we have ever seen of the produce of North America. Upon the whole there cannot be any doubt that the agricultural products of Canada may afford samples for the great English Exhibi-

tion equal to any that will be sent there from North America, and perhaps equal to any produced out of the British Isles. With these prospects we should be perfectly content. It will show the people of the British Isles that Canada is favourable for the settlement of Emigrants, and for the employment of capital. It is to be regretted that among our products we have not more of flax, hemp, and the seed of each, which certainly might be raised here in considerable perfection. Even to supply our own wants it would be very desirable. The more extensive use amongst us of articles made from flax grown here should be encouraged. It would for many uses, be much preferable to cotton. In our warm Summers the entire wearing apparel of farmers and their labourers, might be made of linen and flannel produced, and manufactured in Canada. To a very large extent we might manufacture flax and wool grown by ourselves for domestic uses, and of better quality than what is in general use with farmers at present. The implements of agriculture of every description should also be of our own manufacture, from our own wood and iron, of which we have abundance. The Montreal Exhibition will be likely to do much good, by bringing samples of all the products of the country together, as well of agriculture as of manufactures. This good which may be anticipated, is apart altogether from the connection it may have with the great Industrial Exhibi-

bition in England. Any party well acquainted with this country and its capabilities, must be perfectly aware of its vast resources and that they have not yet been developed to any thing near the extent they are capable of. Indeed there are few countries which possess a greater variety of resources for supplying all the wants of a large population notwithstanding our short Summers and long Winters. Some may doubt the fact, but we feel almost convinced that Canada is capable of producing a greater variety of the necessaries of life than the British Isles, and in a degree of perfection proportional to the skill and capital employed for these productions, where the production is not indigenous or spontaneous. There are many articles produced naturally here, which they have not in the British Isles. Maple sugar might be made here to a great extent, if care was taken of the trees, or a succession kept up by regular planting. The manufacture of this might be greatly improved by using suitable utensils and careful management. What an advantage it gives us to be able to produce Indian-corn, as well all as other grains grown in Britain? Indian-corn may answer as a green crop and will be more suitable for our climate than root crops would be.

In the articles of butcher's meat, although the British Isles are famous all over the world, for having the fattest animals that can be seen in any country, yet we certainly have meat sold in our markets, which we would prefer infinitely to a large portion of that sold in British markets, that is only fit for the manufacture of soap. We have most excellent mutton, lamb, and veal here, and when there is any that is not so, it is the farmers' fault. We have also excellent beef, and where can there be pork superior to Canadian? If any of these articles are not as good as they should be it is from the farmers' own neglect. Our beef, mutton, lamb, and veal, may be sufficiently fat for any purpose or for any table, and when they are so,

they are equal, if not superior, in sweetness and good flavour to the highly fattened animals of the British Isles.

We have very many valuable advantages, if we employ them, and work them properly. It may be truly said of Canada that it might be a land abounding in corn and cattle, in wool and flax, in milk and honey, in fruits and flowers, in wine and oil, and a thousand other articles that might be added to this list by the skill and industry of its inhabitants. It is indeed a land to be desired, and we may be proud of possessing it.

In the preparation of Agricultural products for the great Exhibition in England, they should be put up in the most careful manner, so as to keep good, and in the same state in which they are put up here, until they appear at the Exhibition. In reference to samples of grain of whatever kind, it should be in a perfectly matured and dry state, or it will not appear to much advantage in England. In shipping, it should be secured from vermin of every species. We had some samples of wheat, oats and barley, sent by a friend in England some years ago and on arrival here, it was found that rats had devoured and spoiled the whole. This may be prevented, as we had some sent out last year that was perfectly safe on arrival here. The most suitable method of putting up grain, would be in *good* bags, that would contain four *Imperial* bushels each, making half an English Quarter. Our *minot* contains, we believe, about half a gallon more than the English *Imperial* Bushel. The *Imperial* Bushel is  $18\frac{1}{2}$  inches in the inner diameter, and  $8\frac{1}{2}$  inches in depth, is to weigh 80 lbs. avoirdupois of water, and contains 2218-192 cubic inches. The height of the cone in heaped measure is to be 6 inches, and the contents of heaped measure is 2818 $\frac{1}{2}$  inches. The Canadian *Minot* contains, we believe, 2331.184 inches, but we do not know what the heaped measure contains. The *Winches-*

ter Bushel contained 2150.4 cubic inches. All the inches are *English* measure. In putting up hams, or bacon, we have always found the best means of preserving them to be, to pack them in casks with the dry hulls of the oats that are taken off the oats in making oatmeal. This substance will keep them safe and good for many months, if they are good when put up. In putting up butter, it should be in air-tight firkins, containing about 56 lbs. of butter. There is no better plan of packing cheese than in boxes containing one in each. Bags containing 4 Imperial Bushels each will be convenient for every variety of grain if the grain put into them is in a proper state of dryness, which is a most essential requisite. It might be proper to send grain in the straw and ear of every species. Roots may be put up in barrels with dry sand, or with the dry hulls of oats which we have recommended for hams. In the October number we shall again refer to this subject, and submit our humble ideas for consideration. Samples of Timothy seed should by all means be sent to England.

A very considerable sale of eggs, takes place at our markets for the United States.—Chickens and fowls, are also purchased to some extent, for the same place. We may expect that this trade will greatly increase, as our means of communication with the States is more easy and rapid. This trade may be encouraged by all means, as it is only a method of disposing of our agricultural produce, *manufactured* into fowls, eggs, and chickens. We anticipate that our best trade will be with the United States, and this trade will, of course, be of reciprocal advantage to both countries, as the latter will not purchase unless what she requires, and it is advantageous to every country to be able to obtain, *at the least expense of transport*, what is necessary for her. Horses may be raised here for the United States to a great extent, and it is a trade not likely to fail soon. There are

many encouraging prospects to Canadian farmers, if they will only put themselves into a position to take advantage of the opportunities that may present themselves. Abundant, and *saleable* products, will place them in a position to supply the markets that may be open to them, and abundant products will be sure to make markets. In a poor unproductive country, there will be neither markets money, trade, manufactures, or commerce. These are facts that will not admit of contradiction.

It is an extraordinary fact, that in some parishes where a considerable number of this Journal is subscribed for, the whole of the subscriptions are paid up, while in others, there are scarcely any paid. Several Agricultural Societies take copies for distribution, and pay for them, while other Societies do not take any. There can be no question that this Journal is published solely with a view of advancing agricultural improvement, and promoting the interests of agriculturists. It is ungenerous then in agriculturists to withhold their support, even, though it should not come up to their ideas of what an Agricultural Journal should be. It might be useful to know why some Agricultural Societies, and some parishes subscribe and pay for it, while others do neither. A large number of copies are forwarded to parishes where they are not paid for, but it is to be hoped they will be paid for yet. It is singular that the Journal should be estimated so differently by parties, when it is compiled for no particular party or locality, but for the benefit of Agriculture generally.

To the friends of Agriculture in every country, it must afford much gratification to see the "Reports" of the proceedings at the great Annual Meeting of the Royal English Agricultural Society, which took place in July last, at the city of Exeter. The pre-

paration for the Meeting and reception given to the great National Agricultural Society, was worthy of the people, and of the ancient city of Exeter, the capital of the beautiful County of Devon. It is encouraging to farmers even in this distant Province of the British Empire, to hear of the interest manifested for Agriculture at that great Meeting. All parties, and all classes, were unanimous in their exertions to prove their respect and regard for Agriculture, by doing all in their power to honour it. It is in England that Agriculture is estimated in proportion to its vast importance to that country, and to the world. In Canada, although our population are much more exclusively dependant upon our Agriculture, than the population of England are upon theirs—how is it estimated generally? What degree of interest would our principal cities and citizens manifest, and what sort of preparation would be made for, or reception given to a great Agricultural Exhibition? We are sorry to fear that it would be very different from what took place at Exeter. Agriculture with us, is undoubtedly of vast importance, but the fact is admitted in words, rather than by the adoption of measures calculated to encourage, and secure its prosperous condition. Is there any city or town in Lower Canada that would manifest such a deep interest, offer such a hearty welcome, and do so much honour to an Agricultural Exhibition, as it is our pleasure to report of the city of Exeter? We shall see, and it would afford us the greatest satisfaction to be able to report that there was. A prosperous condition of our Agriculture would prove the salvation of this country and it is impossible to secure its general prosperity by any other means. This is so manifest, that there cannot be any mistake. Agriculture must form the basis of our prosperity, and to expect to build it upon any other foundation will only bring disappointment. Manufactures and commerce,

growing out of, and supported by Agriculture are very desirable, but, both are undoubtedly second in importance to Agriculture. The richest mines of copper, silver, gold and precious stones, were they discovered in Canada to-morrow, and however successfully worked, could never produce the same or an equal degree of prosperity and happiness to our population, that the judicious cultivation of the soil, and management of our cattle, would afford them, and who is it that would not prefer the healthy, pleasing, and honourable employment of the husbandman, to searching after gold in the bowels of the earth, or the mud of the rivers. And what is the value of silver and gold after all, except to purchase the products of Agriculture and of the lands in their various forms, as necessaries of life? Had we ever any doubt of the cause, we humbly endeavoured to advocate for so many years, these doubts would be removed, by hearing that the great and the good of other lands express their high estimation of Agriculture, and regard it as the most important and honourable occupation of mankind. Agriculture is not estimated by the wealthy and educated, in proportion to the profits it may return to them, but by the pleasures and healthfulness of the occupation, a residence in the country, surrounded by all the beauties of nature—an opportunity of seeing the progress of vegetation from the beginning of the Spring, until trees and plants, mature their products, and yield an abundant harvest. The domestic animals of Agriculture, that produce so many of the necessaries of existence to mankind, afford also, very great enjoyment to a resident in the country who can appreciate these things. All these enjoyments are of inestimable value to those who love the country, though they may be very little prized by those who prefer the town, and who perhaps, have seldom witnessed the rising or setting sun in Summer. Farmers who have to make a living by their

business must do so of course and spend according to their means, but the wealthy who reside in the country, and enjoy all the pleasures we have enumerated, with many others we might enumerate, should not be dissatisfied, although their balance sheet at the end of the year, should not show large profits. We must not forego this opportunity of giving a part of the "Report" of the Meeting at Exeter, and we particularly recommend the speeches delivered on that occasion by the representatives of two great Nations, France and the United States. These gentlemen appreciate the meeting and the exertions made in England to promote agricultural improvement. This "Report" should stimulate us to exertion—we cannot follow a better example than England affords us, so far as regards attention to Agriculture. It cannot fail to be a pleasing reflection to parties in Canada who are conscious of having done all in their power to promote agricultural improvement, when they hear of what is doing in the British Isles. Parties who can do more, will no doubt, employ all the means in their power, in future, to advance the interest of Agriculture, and promote its improvement, where it is most required. However we may fail in our argument to prove our proposition, Agriculture is of greater importance to the Canadian people than all other occupations put together, now, and at all future times.

DECORATIONS OF THE CITY OF EXETER

Are on a par with the magnificence of the other arrangements. From almost every window and house-top may be seen waving, flags of every description, from the magnificent silken standard of Southernhay, down to the cotton stocking hanging from the garret window of the west-end shop. Windows and doors are completely hidden beneath plants of all kinds. The town is a vast greenery, and one acquainted with the preparations would imagine that Stoke Wood had, in imitation of Pirnam Wood's trip to Dunstanane (though with a better object in view), paid a visit to the old city. But we are doing the descriptive rather irregularly, and we'll first ask our readers to step up as far as Peter Lis-

son's the best starting point for a more regular description. From the Aeland Arms across the road to the higher corner of Summerland street is a splendid green arch, decked out with pictures (illuminated at night) expressive of the loyalty which everybody knows is so superabundant in the bosom of the worthy Peter; on the right of the face of that side of the arch looking up the street is a motto painted for the occasion, "God Speed the Plough. May Old England ever maintain her rights." In the middle is a loyal wish expressed that Her Majesty might live long and never forget the principle which placed her forefathers on the throne. On the left is "Loyalty to our Queen, Submission to Her Laws, and Happiness to Her People." On the other side of the arch on the right is a painting of a soldier with his foot on a cannon, and the following motto under, "Quo Fata Vocant." In the middle, beneath a picture of Her Majesty, is "Long live the Queen and Prince of Wales; may Her Majesty never forget the Principles of her Forefathers; and may her Illustrious Offspring long live to protect our glorious Constitution in Church and State." On the top of the arch is a crown, the gaiety of the whole scene being greatly enhanced by an elegant display of flags. The effect of the view up and down the street from this spot is most enlivening, from the gay colours of the numerous flags playing in the breeze as if imbued with a spirit of the general rejoicing. Arches are also erected in Paris-street under the direction of Mr. John Ware. Fore-street abounds with flags of the most superior order, and the decorations generally are most superb. At the entrance of Queen-street is a magnificent green arch, 40 feet high, erected under the superintendance of Mr. Huxtable; on the top is a crown, of imitation gold and crimson, seven feet high, made by Mr. Vicary of this city, the ornamental work being done by Messrs. Dipstale & Bradley. On the side of the arch facing Fore-street, is lettered "Agriculture and Commerce," and on the side facing Queen-street, "Let Industry be praised," the latter having on one side a painting of the Castle of Exeter, with the motto "Semper Fidelis," and on the other the "Cornucopia." On one side of the former is a wheat sheaf, on the other side a vessel in full sail. On each side of Queen-street, as far as the market, an avenue of young fir trees is placed, the idea of Mr. Sobey. and which has a beautiful effect. Mr. George Ferris, whose superior taste is always discernable on such occasions, has decorated the top of the house, on which is the figure of the Queen, with signal flags, giving it the appearance of a yacht, which we have no hesitation in pronouncing the best show of flags in the city. The loyalty of the occupants of the fish market is most conspicuous, the place being decked out with flags, flowers and evergreens "whose silken eloquence, more rich than words"

(of occupants), testifies their right good feeling. The gaiety of the scene does not lack for a moment from one end of the city to the other, and Exe Bridge has one of the most beautiful arches in the town. On each side is a splendid fir tree nearly 30 feet high. The height of the first arch is 21 feet, and over which is raised another arch, about 13 feet diameter, lettered "Victoria," on each side of which is a fine orange tree in full bearing. The arch is composed of green holly and fir, and each side being ornamented with wreaths of flowers (*Lilium aurantiacum*), the arrangement of the whole showing the most exquisite taste. The arch was erected by Mr. Stafford, builder, Bartholomew-street, under the superintendance of Mr. Nott, nursery and seedsman, Bridge-street; Mr. Mogridge and Mr. Furse were also very active in carrying out the arrangement. From the top of South-street, to the bottom of Holloway-street there were several arches all erected by Mr. Mason.

#### MEETING AT EXETER.

The twelfth Annual Meeting of the Royal Agricultural Society of England came off last week in the ancient city of Exeter, and in no other place the Society received so warm and flattering a reception.

Though the proceedings of the show did not commence formally until Wednesday, the note of public rejoicing had already been sounded. Flags of all nations, parties, and colours, were hung out from the windows, triumphal arches spanned the principal streets, mottoes of a patriotic and agricultural character appeared on every side, with a due proportion of evergreens around them to set them off, and make them have a refreshing effect.

At the Pavilion Dinner, about 1200 noblemen and gentlemen were present. The following is the speech of the French Ambassador, Mr. Drouyn de Lhuys.—

The FRENCH AMBASSADOR rose to return thanks and was received with a roar of applause. He said—Mr. Chairman and Gentlemen, I beg leave, both in the name of my colleagues and in my own name, to return you our best thanks for your most cordial welcome. We respond with the feelings of gratitude so fully due to your kind reception (cheers). Though without any pretention to practical knowledge of the details of agriculture, I have the utmost esteem for its manly and useful pursuit (cheers). Even as a passing traveller through this delightful country, so aptly called the "garden of England," I have had leisure to admire the spirit and energy exhibited by your landlords and farmers, with the view of rendering the land increasingly productive in proportion to the increase of your population (cheers). I was struck with wonder at

the sight of those alterations brought about through the labor of your experimentalists and the researches of your men of science. Whether consider your superior breeding of stock, your improved implements of husbandry, your various systems of cropping, your bold process of draining and subsoiling, or your happy application of chemical discoveries for remedying the defects or adding to the natural capabilities of your different soils—whether I behold around me your sturdy Saxon yeomen—(cheers)—yes, I say your sturdy Saxon yeomen and their blooming daughters—(renewed cheers)—well may I say never did Divine Providence grant a more promising land to a more deserving race (continue cheering). Once more I have the honor to return our thanks for your cordial hospitality, and I beg your leave to couple with the expression of these thanks a toast which, I am sure, will be received well by all of you—it is the toast of "Success to the Royal Agricultural Society of England" (reiterated cheering).

The American Minister, the Hon. Mr. Lawrence, on proposing a toast said:—

The AMERICAN MINISTER then rose, and was received with an enthusiastic welcome. He said—My Lords and gentlemen, I have had placed in my hands a toast, which I shall offer with very great pleasure, inasmuch as it relates to the great interests of this country and of all other countries, inasmuch as to me there is no want of Harmony in those interests, if properly regulated (Hear, hear). Without touching upon any point that could give or would give the slightest umbrage or the least ill-feeling to any human being, I will, without further comment, announce to you the toast, at this moment. It is, "Agriculture, Manufactures, and Commerce" (cheers). A friend as I am to all those interests, and believing that the power and glory and interests of this country have been promoted by the encouragement of them all, I rejoice that agriculture is first (loud cheers). I came here not as a foreigner, I came here to claim relationship with you (Hear). I came here, for the first time in my life, to see the farmers of England with my own eyes (A voice, "Look at 'em") (laughter;) believing that when I saw them I saw the backbone of England (renewed and enthusiastic cheering). I know too well the history of my ancestors and of my kindred in England not to know that the farmers of England have always been loyal and true to the Crown; I know their history too well not to know that the battles of England and the glory of England are owing to the patriotism, the power, and the sacrifices of the farmers of England (vehement cheers). I came here because my ancestors were all farmers, and English farmers too (Hear). and I came here as the representative of a country whose great national interests are those which are founded in

the soil (loud cheers). I came here to pledge you, and to offer to you in that kind and fraternal feeling which should exist between two great nations connected with each other by such enduring ties, the sympathies and the kind feelings of the great body of the farmers of the United States (loud cheers). I came here as your representative to tell you and to make you realize that they feel under great obligation to you for the experiments that you have tried, which we being young and not rich (laughter) are not able to try, while you have the capital, the skill, and what is more the science, which has been applied to the art in Great Britain (cheers). When I look to the state of your agriculture in 1850, and compare it with its state in 1830, I am perfectly amazed. I have been overwhelmed to-day—I have seen so much and heard so much that I haven't had time to digest (laughter, and cheers). I have seen to-day that which I have never seen before. When I look back to this country only 30 years—and in the annals of time it is but a day—I look at a period when the average product of wheat was not more than from 20 to 22 bushels to the acre, and now all parties of all shades of political opinion agree that the average product is from 24 to 30 bushels to the acre (cheers). We of the United States have not the slightest jealousy of the agricultural interest of England (a laugh). We rejoice in every new agricultural improvement you bring out suited to your condition. We rejoice when we hear that through the application of agricultural chemistry you can produce another spear of grass in this kingdom. It has been said very truly that he who produces two blades of grass where one grew before is a public benefactor. I agree to that. If that be true, you are all public benefactors, because you are increasing the productiveness of your country. It is a matter for you and not for me to decide upon those great questions that agitate this country now; for I did not come here to enter into the political discussions of the British people. I may be allowed to have my own opinions, but those opinions will never be expressed in Great Britain, so far as regards the internal policy of Great Britain. But I can tell you that the more food you produce, and the nearer you come to providing a supply for the whole of your population, the more rejoiced I shall be and the country I represent. In regard to commerce there is not a man within the sound of my voice, I apprehend, who will not agree with me when I say that commerce, or navigation, or trade, or whatever name you may choose to call it, is essential to the prosperity of the agricultural interest (cheers). Commerce has been the great pioneer of civilization; and what country has done so much as this to civilize the world through the instrumentality of commerce? (cheers). I wish to do perfect justice to all interests, for I believe they are all in harmony. In regard

to manufactures it would be idle, futile, and foolish for me not to acknowledge that the manufactures of England—the spindles of England, if you please—have, in conjunction with this great, powerful, and patriotic body of men, the agricultural interest, fought the battles of Great Britain (cheers). To me there appears no discrepancy whatever in maintaining that all these interests are vital to the prosperity of this nation. In all great nations I believe these three interests are identical. It is for you to decide, and not for me, how far you may be willing to be independent of foreign nations for food (Hear, hear). That is a question that belongs to the English political casuist, and not to a man representing a great nation on the other side of the Atlantic, which is a great producer of food. That is a question I shall not touch upon. It would not become me. I did not rise for the purpose of expressing opinions in regard to the internal policy of this great nation; but I tell you that I should deem it a misfortune to my own country and to the world if, by anything, whether by the act of our own legislature or from any other cause, this mighty nation, Great Britain, should lose any portion of its power in the family of our nations (loud and repeated cheering). There is room for us all (Hear, hear). I desire to see competition among liberal—in fact, among all nations—but I desire most to see a competition existing between the old Anglo-Saxon and the young Anglo-Saxon (cheers). But let that competition be upon the principle—which of us shall most advance and diffuse civilization throughout the world? which of us will extend justice to feebler nations than ourselves—education, religion, the bible? (protracted cheering). Let that competition be this. Let us see which nations will do the most good (repeated cheering). I am happy to state that the United States is not represented alone by me on this occasion. I have on my right one of the most distinguished statesmen, and, what is better, one of the greatest and best farmers of the Union. That gentleman is the American ambassador at Paris, who has come here to meet you this day—His Excellency William C. Reeves, of Virginia. Nor are Mr. Reeves and myself the only representatives of the United States. In this room certainly—but in the vast assembly I cannot point out the precise spot—is a gentleman, one of the greatest farmers and stock growers of the Union, from the province of New York, Col. Morris, vice-president of the New York Agricultural Society, a gentleman who has been purchasing the stock of England very largely, that we in the western world may improve our own (cheers). Whatever you may think of your cousins on the other side of the Atlantic, I can only state to you, as their representative, that they are proud of their origin and rejoice that they are descended from the Englishmen (cheers). I hope at no distant day,



going on as we are at the rate of a million a year in our population, and we rejoice that we do increase, for we have room enough and food enough and labour enough for all—I hope at no distant day that we, your humble cousins, shall return to you, the farmers of England, to some considerable extent—it must be done by instalments (a laugh)—the great debt we owe to you in the agricultural line for the improvements you have made, for the instruction we have received, and for the great benefits our whole country has derived from your experience. I beg to thank the president and council for the opportunity afforded me to-day of being in this old Roman city of Exeter (cheers) and in this renowned country of Devonshire, distinguished for its rich red soil, its beautiful red cattle, and, in olden time, for its fine red cloaks (cheers), celebrated in poetry as well as in prose. It is renowned as the birthplace of that great and mighty man, Sir Walter Raleigh, the man who first went to the country of my illustrious friend, Mr. Reeves, a man whose name renowned in history will live as long as England exists. But before I sit down I must offer my thanks, as an humble individual, to the inhabitants of this city of Exeter. Wherever these annual exhibitions may take place, I think you will be fortunate if you find a city presenting so much neatness, so much simplicity, so much taste, and so much cheerfulness that one feels at home the moment he enters it (cheers). It is the first time I have ever set my foot in the county of Devon. I can only say I am indebted to the kindness of—I do not know what to call him (laughter); he is a general philanthropist, engaged in every good and great work—Sir Thomas Acland (applause). I believe it is to Sir Thomas I am indebted for the privilege which I enjoy this day. I am certainly indebted to him for his hospitality in entertaining me and my friends yesterday, last night, and to-day. And on the part of myself, of my country, and my countrymen who are now present, I feel under the deepest obligation to the Royal Agricultural Society of England for the opportunity afforded us of being here. I have said it is the first time I have ever set my foot in Devonshire—I hope it will not be the last (loud and long-continued cheering).

The Hon Mr. Reeves, American Minister to the French Republic, made the following observation in his speech. "It was his firm belief, that the pride and glory of England were to be found in that noble Agriculture, which, whilst it had improved the race of their useful animals had almost multiplied the fruits of the earth to an extent of which he could not form a conception,

until he saw with his own eyes that day, the prodigies which had been effected"—Such is the testimony of able, honourable, and disinterested men of the Agriculture of England, and we fervently hope that these "Reports" may have the effect of stirring us up to do all in our power for our Agriculture. How creditable it would be to Canada, if strangers coming to visit the country were to compliment them on the state of their Agriculture in terms similar to those we have copied above?—Yes—indeed—it would be the greatest honor that they ever can become entitled to, and it is in their power to gain such honor.

EXETER, SATURDAY.—To all intents and purposes the Great Western Agricultural Festival was over with the conclusion of the Pavilion dinner. Exeter next morning was thinning rapidly, and one by one the flags and arches, which made so good a show all the week disappeared.

At one o'clock, the dinner given to the humbler classes in the Pavilion took place, and the affair went off with the greatest possible *éclat*, and the most gratifying expressions of good will. The guests amounted to about seven hundred. At the chairman's table the mayor and corporation of Exeter were placed, and the raised side benches furnished accommodation for a number of ladies on gentlemen anxious to be present and so interesting an occasion. The good things provided were done most ample justice to. Indeed, it was delightful to see the celerity with which the plates were cleared, and the hearty enjoyment visible upon every face engaged in the process. The baron of beef formed the great feature of the entertainment. It was cut into two huge piles of meat, at one of which M. Soyer presided, and at the other his able coadjutor in the pastry department, Mr. Read; and the rush of plate bearers—for to some extent every man was his own waiter—amply proved that the courage of the guests was not abated by preliminary trifling with fowls and lambs. And so the baron *à la* Magna Charta melted like a snow-ball in an oven,

After dinner the Mayor proposed the loyal toasts, and most loyally they were drunk in beer and cyder. The "Prosperity to the Royal Agricultural Society—the Founders of the Feast," was drunk; after which the Mayor passed a high eulogium upon the excellent and orderly conduct of the working men of Exeter during the Meeting. The speech was replied to by a

working man of the name of Upright, who spoke sensibly, with good taste and feeling, and very much to the purpose.

At the conclusion of the proceedings a wish was expressed on the part of the guests that they should shake hands with M. Soyer, with whom the notion of the entertainment first originated. The Regenerator accepted the proposal with enthusiasm, and stationing himself at the principal exit, had his hand shaken until it was all but shaken off by the enthusiastic guests. Altogether the occasion was an interesting one and a peculiar one, and it is to be hoped that the hint it affords will not be lost upon the Royal Agricultural Society at their future festivals.

In the evening a display of fencing and other entertainments attracted a large crowd to the Pavillion. M. Soyer was again the lion of the occasion, and, appearing in the insignia of his profession, cooked a profusion of cutlets with his magic stove, amusing the audience at the same time with an admirable gastronomic prelection. The display was applauded to the echo; and it is gratifying to be able to add that the ladies present caused the cutlets to disappear in no time. In fact, the sociable and *sans façon* style of the whole proceeding was most amusingly characteristic. M. Soyer will leave a great name behind him in Devon.

Thus then the proceedings of the Royal Agricultural Society have this year been brought to a very satisfactory termination. The Exeter Festival was full of new points and characteristics, and has no doubt a very salutary impression, and sown much good seed in the minds of the agriculturists of the Far West of England.

## THE WORLD'S INDUSTRIAL EXHIBITION. No. II.

To the Editor of the AGRICULTURAL JOURNAL,  
Montreal.

SIR,—In a communication addressed to the Canadian Agriculturist, under date of 21st May last, I endeavoured to draw the attention of the Canadian public to the Grand National Exhibition, suggested by His Royal Highness Prince Albert, and to make some general remarks for the purpose of arousing the public mind to immediate and decided action in the matter. About the same time I addressed a letter to Mr. Logan, Provincial Geologist suggesting the immense advantage that would accrue to the Province, could he be induced to arrange and pack up his Geological specimens, revise his Geological reports and proceed with them to London and there exhibit them at the world's exhibition to take place in May next. In my note to Mr. Logan I made the inquiry if the government had made any overtures to him on the subject, or if the city of Montreal had done so. At the same

time I gave it as my opinion that no man in Canada could render such signal service to his country as he could by carrying out the above suggestions, thereby bringing this great Colony under the favourable notice of the British people. In personal conversation with Mr. Logan, I have been induced to believe that he would be most happy to meet the wishes of the Government should they entertain the same views of the subject. The time of meeting for the whole world has no doubt been well chosen, although in this country without a railroad to the ocean it is rather inconvenient, but still these minor obstacles must be overcome. Our American neighbours no doubt will tender to us the use of their many channels of communication to the ocean, to enable us with the least possible inconvenience to attend in London at the time appointed and I would fain hope that in case the British Government decline sending out vessels to her Colonies to carry home specimens of Colonial produce for the Exhibition, that those British Merchants in Britain connected with the Canada Trade will direct their consignees and agents in Canada and the other Colonies to give free passage and freight to the Delegates and articles to be sold to the Grand Fair. I feel much pleased that the Provincial Government have been liberal in granting £2000 to aid this great work, and that they are now awarding liberal premiums for that object. A permanent and enduring service would be rendered to the Colony if one fourth of this liberal grant were to be set aside as premiums to be awarded in sums of fifty pounds for the best written treatise on each of the following subjects.

1st. On the best system of Moral Religious and Scientific Education applicable to the whole people.

2nd. On the Agricultural productions of Canada.

3rd. On the review of the Laws of Canada West.

4th. On a review of the laws of Canada East and their practical bearing on the prosperity of the Colony.

5th. On the best Geological report of the United Provinces.

6th. Best treatise on the practice of Medicine.

7th. On the best system of internal improvement, apart from Canals.

8th. On the best system of emigration to Canada.

9th. On the best system of Manufactures applicable to Canada.

10th. On the best mode of conducting the Lumber Trade.

I have read with no ordinary degree of satisfaction, Mr. Thomas C. Keefer's work on Rail-Roads and also his prize essay on Canals. The

reading of these works has suggested to my mind the benefit that might arise to Canada were the Government to offer premiums for similar essays on each of the foregoing subjects or on any other subject tending to improve and advance the interests of the Colony. This inducement would exert a powerful influence in bringing forth the latent talent of our country.

From a perusal of Mr. Keefer's last work, I learn that Great Britain requires yearly on an average nearly 2,000,000 barrels of flour over and above her own production of bread stuffs. Let Canada West continue to increase her produce in the same ratio that she has done for the last three years, and in two years she alone will be able to supply this deficiency and if so would it not give her some claim to protection, as we now pay off 20 per cent on bread stuffs exported and consumed in the United States. The internal wealth and resources of Canada only require an increase of Capital and population to rank her the finest Colony of the crown. Let any person who travelled through Canada twenty years ago, pass through it at the present time and he cannot say that her people are destitute of that energy of character necessary for her steady and permanent advancement. Let not, however, the present opportunity pass unimproved in bringing her under the favourable notice of the British Government. The highest amount of good that will arise from the World's great Industrial Exhibition will be the extension of friendly feelings among all the civilized nations of the Earth, and the softening down of national asperities, and by a frank and free interchange of opinions it will have a sure tendency to promote prosperity and peace.

Should you think the foregoing communication entitled to a place in your columns you are at liberty to insert it.

L'Orignal, 21st August 1850.

CHS. P. TREADWELL.

*President of the Agricultural Society of the United Counties of Prescott and Russell.*

**POULTRY MANAGEMENT.**—I have always considered the rearing and management of poultry a matter of much more importance to the farmer than he is generally willing to believe. My poultry are of the same sort as may be found in any of the neighbouring farm-yards; the eggs of the largest and best hens have been selected for sitting, so that the stock consists of birds capable of covering 15 eggs, which is the largest number I ever placed under a hen. The cocks are changed every two years, taking care to supply their place with fine healthy birds of the previous year. Hens are useless after the third year; my plan is, in a stock of say 30 hens, to introduce 10 young pullets every year, and part with 10 of the oldest hens. One male bird must be kept to every seven hens; but when more than 50 hens are kept, one to every six is

necessary. On the proportion of male birds I depends, I am confident, the number as we the successful fecundation of the eggs. A month since, as an experiment, I placed eggs, which I had procured from a farm where the proportion of male to female bird about 1 to 15, under a hen, and mark the result. From 13 eggs were produced three chickens seven of the eggs, at the end of three weeks were almost as fresh as when just laid, and they were added. My chickens are fed twice a day in the morning about half past seven (later course in winter,) and at two in the afternoon. Their food consists, during the five summer months, of dry barley, and from October till April of boiled barley given warm, and 20 oz. per day each, of tallow cake or chandlers' greaves (the same as used by Mr. Huxtable for his pigs; the cost of this latter is a fraction under a penny per lb., and is, I think, the best and cheapest substitute for the animal food they are unable procure in the form of flies and insects, at this season. I have found by experiment that fowls will lay more regularly on barley than on any other grain. Hens during the period of incubation should be fed on dry barley, as the greater heat maintained in the body of the hen the first and more numerous will be the progeny. Next turn the eggs as some do; the hen will do it herself. Leave the chicks till nestled, i.e. till the down becomes dry; feed them on soaked bread for the first two days, returning them as soon as fed to the mother, after which they may be kept on tail wheat (and curds, if you have the milk,) until they are seven or eight weeks old, when, and not till when, they may be fed on barley and barleymeal, mixed with bran and pollard. I have this year only 18 hens and three cocks, the foxes having stolen rather more than one third of my stock during the winter; these 21 fowls consume a sack of barley, which cost now 11s., in 31 days, and have laid on an average 16 eggs per day since the 1st of March. I find the expenditure for corn, tallow cake, &c. for the old stock (not for the chickens produced by them) pretty nearly balanced by the receipts from the eggs one time with another. The following is the account, Dr. and Cr., of a stock of eight hens and one cock kept by myself, in an enclosed yard, during the year 1849.

DEBTOR.

Eggs sold—number unknown, but furnished all food consumed by the nine fowls mentioned.....	0	0	0
Chickens reared. — 33 couple sold at 3s 3d.....	5	7	3
13½ couple reserved for stock for present year at 3s....	2	0	6
3½ couple of ducks at 2s. 9d.....	0	9	7

£7 17 4

CREDITOR.

1 sack of barley consumed by young chickens.....	£0 15 6
1 strike of barley for do., and grinding.....	0 4 4
1 cwt. bran.....	0 5 0
6 pecks tail wheat.....	0 6 0
Marketing expenses.....	0 6 1—1 16 11

£6 0 5½

£6, Os. 5½., divided by 8, the number of hens, gives a net profit of rather more than 15s. for each hen.—*The son of a country Rector in Agricultural Gazette.*

GREAT MEETING OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND, AT GLASGOW.

On Wednesday evening, a lecture on manures was delivered in the Trades' Hall by Dr. Anderson, the chemist of the Society. The assemblage on the occasion, which was numerous, was almost entirely composed of agriculturists both from our home counties and from a distance. The learned gentleman was accompanied to the platform by the Lord Provost and the Duke of Roxburghe. On the motion of his Grace, his Lordship took the chair, and introduced Dr Anderson to the meeting; he was received with considerable applause.

Dr Anderson proceeded as follows:—It will be admitted, I think, on all hands, that there is scarcely any subject more deserving the attention of the farmer than the careful management of his manures. Under any circumstances this is a matter of vital importance; but the progress of agriculture, which now more than at any former time, compels every man to obtain from his land the greatest possible amount of produce, has given it even greater prominence than it before possessed, and necessitates a far more careful attention to the subject in all its bearings than it before required: and the introduction of what are commonly called artificial manures, has had the effect of still further complicating the whole matter. And opening up questions, which a very short time since would have been considered altogether beyond the range of such inquiries. The consequence of this is that our knowledge is at the present moment in a purely transition state, and is deficient in much of that definite information which is requisite for enabling us to arrive at legitimate conclusions regarding the comparative values of different manures, and many other points which it would be most desirable to have established in a satisfactory manner. In fact, any one who has occasion to inquire into those matters has questions constantly presenting themselves to him, in regard to which we possess no information at all

or other cases in which they render probable certain conclusions which might be established by the results of experiments made in the field, which have either never been made or have been done without those precautions required to raise them above the chance of fallacy. It has appeared to me that the present affords an advantageous opportunity of calling your attention to questions which must indubitably depend for solution on the mutual exertions of science and practice. For I hold it to be certain that the two must go together, and that though some of the facts we require may be determined in the laboratory, there are many questions which, though suggested by science, can be established only as facts by experiments in the field, performed with every attention to care and accuracy. I hold also that neither of these methods of experiment will in themselves suffice; they must go hand in hand if our results are to be of value. Separately the chances are that they lead to mere speculations, of which science will supply one set and practice the other, for you must allow me to say that practice occasionally ventures on speculations of its own. In discussing the general question of the economy of manures on the present occasion, I must be contented to do so only in a very general manner, as your time will not permit me to go into my details. My intention is rather to bring out some facts little attended to, and, if possible, to draw from the practical farmer such information as he may possess, or to induce some of those who now hear me, to add themselves to the number of those who endeavour experimentally to add to the common stock of information. And I shall advert, in the first place, shortly to the general properties of manures, and in doing this I may possibly have to touch upon some matters with which you may be already partially acquainted, yet which cannot, nevertheless, be too frequently brought under your notice. If we examine, then, any of our common plants, we find it to be composed of a considerable number of chemical substances. These substances may be divided into two great classes, separable from one another by a very simple experiment, which is neither more nor less than burning the plant. When this is done we obtain its *ash*, containing the whole of one of these classes; the other has, in the process of burning, passed into the state of gases, and so escaped the observation of our unassisted senses. The former of these are called the *mineral* or *inorganic* constituents of the plant, the latter the *organic* constituents, because they are peculiarly present in all organized beings. The latter of these classes is a limited one, and contains only four substances, carbon, hydrogen, oxygen, and nitrogen. The former is much more extensive, and comprehends a considerable number, of which the most important are sulphuric acid, phosphoric acid, lime, magnesia, potash, and soda. Now the existence of the plant depends

upon its obtaining all these, as well as one or two less important substances, in sufficient quantity; without these it cannot flourish, and just in proportion to the amount in which they are supplied will be the luxuriance of its growth. I say the growth of the plant will be proportional to the supply of these constituents. This statement, however, is not to be taken in its widest sense, because nature has fixed a certain limit, beyond which no supply of these substances, however liberal, will raise its growth but up to that limit the statement is substantially correct. From whence then is the plant to derive these substances? And in answering this question it is necessary to distinguish between the two classes of substances to which I have already referred and inquire separately into the sources of each. Of the inorganic constituents there can be but one source, the soil, namely, which to be fertile must contain the whole of these substances in greater or less quantity. It is different, however with the organic constituents which have a two-fold source, and of which part, or even the whole, maybe derived from the surrounding atmosphere. The atmosphere is, in fact a great reservoir of the organic constituents of plants of which it contains all four; two of these nitrogen and oxygen forming almost the whole of it; the other two, carbon and hydrogen, existing in smaller proportion in the forms respectively, of carbonic acid and the vapour of water. It must be understood, however, that all soils contain a certain quantity of the same substances, in form of what is called *organic matter*, in a state in which all these four substances may be supplied to the plant. Now, every *fertile* soil contains *all* the constituents of the plants which grow upon it, and that too in sufficient quantity to supply many successive crops, a position which I have had recently an opportunity of illustrating in a very complete manner in a series of analyses of the wheat soils in Scotland, published in the last number of the *Highland Society's Transactions*. I have there shown that even nitrogen, of all others, the element which we should least expect to find in them in abundance, nevertheless exists in what must be considered a comparatively large proportion. But it is important to observe that it is not enough that these substances shall exist in the soil; it is further necessary that they can become available to the growth of the plant. Now, to provide for this, nature has introduced an extremely beautiful and important provision. In order that these substances shall be absorbed by the plant, they must exist in a soluble condition. It is, however, very manifest that if the whole valuable constituents were soluble, the good effects of such an arrangement would be altogether defeated; for the rains would soon wash away from our soils all that they contain of valuable matter. To obviate this, however, nature has so arranged it, that these constituents exist in the soil in the

state of insoluble compounds, which, under the influence of air and moisture, gradually undergo a series of very complex decompositions, which slowly liberate the constituents, as they are required to support the life of the plant. But nature has fixed a limit to this change, and has caused these constituents to become soluble with extreme slowness, only, and in no greater quantity, than is requisite for supporting that amount of vegetation which the general economy of the globe requires. Now the whole principle of cultivation is to obtain, by proper treatment, from a given surface of land, a greater amount of vegetation than it is capable of producing in a state of nature. And this is effected partly by tillage, which breaks up the land, and by the admission of air and moisture facilitates the decompositions, by which these valuable constituents of the soil are liberated from their insoluble state. The other and equally important means is by the addition to the soil of those substances which the plant requires, in other words by the use of manures. A manure, then, ought to contain *all* the substances which a plant requires for its growth. And this is unquestionably what a manure of theoretical composition should do. Nay, more, it ought to contain these substances exactly in the proportion which the plant requires, so that no waste may occur. It must, however, be manifest to every one acquainted with agriculture, and still more manifest to every one acquainted with chemistry, that it is impossible to carry out practically what is true in theory: nevertheless, the aim of skilful and scientific practice ought to be to approach as near to theoretical perfection as it is possible to do, though in the very nature of things, we cannot even hope absolutely to arrive at it, or even near it. Although, however, we cannot hope to arrive at perfection, we may advantageously aim at a somewhat lower and less difficult standard, for experience and science concur in showing that all the constituents of a manure are not equally important, but that those are more essential which the plant has greater difficulty in obtaining from other sources. Now, in this point of view, nitrogen is the most important of all the constituents of a manure, because it is that which nature supplies least abundantly. You may possibly express some surprise at this statement, considering that I, not many minutes since, mentioned that it is at present in enormous quantity in the atmosphere. But it so happens that nitrogen is exactly of all others the substance which most peculiarly requires to be presented to the plant in a special condition. It has been established on most unequivocal evidence that the plant cannot absorb nitrogen *as such*, and that all this immense mass of nitrogen existing in the air is not directly useful to the plant, while it is only a very minute quantity existing in it, in the state of ammonia, which is of im-

mediate value. Of the immense disproportion between the amount of nitrogen in what I may call an inert and active condition, some idea may be formed when I mention that 100lb. of atmospheric air contains about 77lbs. of nitrogen, and, according to a recent determination not more than  $\frac{1}{4}$  of a grain of ammonia. I shall not attempt to enter here upon the question of how the nitrogen of the air passes from its inert into its useful state—a question of much intricacy, which has occupied the attention of many distinguished chemists, without having as yet obtained a perfectly satisfactory answer. It is certain that, under peculiar circumstances, the nitrogen of the air may pass in small quantity into the state of ammonia, but the supply so obtained is small and uncertain. The great source of ammonia is the decomposition of animal and vegetable substances, containing nitrogen, which sooner or later, give off the whole of that element they contain in the form of ammonia. Next to ammonia in importance may be placed phosphoric acid, which is likewise a comparatively rare natural product, and of which also the great source is in animal and vegetable substances, all of which, but especially animal substances, contain it in quantity. It is true that it is found also in the mineral kingdom; but it exists so sparingly that as yet scarcely any advantageous use has been made of that which is obtained from this source. You will observe then, and it is a matter of great practical importance, that the principal source of the two most important constituents of plants is from plants themselves; for even that portion obtained from animals comes originally from the plants upon which these animals have fed. And the same may be said of potash, of which the great source is still from plants. This is a point which I wish to impress particularly upon you, that plants form the great source of these substances, and that this is true, not merely of these substances as manures, but even when you go into a druggist's shop and buy pure ammonia, phosphoric acid or potash, every atom which you get has at some time or other existed in a plant or an animal. These observations lead me directly to the consideration of that manure which consists of the decomposing portions of plants, and that of course is farm-yard manure, the most important of all, that on which the farmer must always be mainly dependant, and, I think I may also say, that, regarding the economical management of which we have the least amount of definite information. I beg it to be understood as my decided opinion, that farm-yard manure must always be the farmer's mainstay. I am aware, indeed, that some have thought otherwise, and we have all heard of an eccentric gentleman who expressed his opinion, that the time would come when the farmer would carry his manure to the field in his waistcoat pocket; and though no one is now-a-days so absurd, some people will

seem to expect that some complete substitute will be found for farm-yard manure. I can assure you, however, that any such supposition is entirely extravagant, and is certainly uncountenanced by chemistry. I do not mean to say that chemistry could not produce a substitute; but what I mean is, that the farm-yard manure must always be much cheaper than any substitute which could be manufactured, and the reason is to be found in the fact that the constituents of such a manure must be extracted from plants, which must necessarily be expensive. While even supposing that to be done, farm-yard manure *must*, in the very nature of things, still always be produced. No question can then be conceived of more importance than of obtaining this manure in its most perfect state, but how that is to be done is exactly one of those questions still unsettled, and which I believe to require very complete and careful field experiments. The exact chemical estimation of the comparative values of different specimens of this manure is a very difficult matter; partly from its extremely complex nature; and, partly, from the many questions it involves. Of course, good farm-yard manure will contain more or less of all the constituents of our crops; but in estimating its value, we must be contented to take into consideration only its most important constituents, and, in this way, I conceive we may obtain a sufficiently near estimate, by knowing the amount of nitrogen and phosphoric acid which it contains; but of these, for many reasons, the first is by far the most important, as it is in respect to it that the value of farm-yard manure appears to vary most. In the management, then, of farm-yard manure, two different questions require to be considered. First, the production of a manure containing the the greatest possible amount of nitrogen and, secondly, the successful conversion of that nitrogen into ammonia. It is not unimportant, of course that the other constituents of the manure should be present in abundance, but it may be assumed, as generally true, that the treatment likely to produce the greatest amount of nitrogen, will be that which produces the most valuable manure in other respects. In regard to the first of these questions, there is a want of definite information. It is a common statement, however, that the value of the manure is dependent upon the nature of food with which the cattle, which produce it, are supplied. That, for instance, cattle fed upon oil-cake produce superior manure to those fed on turnip. I am aware that this opinion is not universal, as I have heard it disputed by farmers of skill and experience. I am inclined, however, to believe that it is to a certain extent correct. Supposing, then, that two samples of such manure differ, it must be obvious that it is the dung and urine of cattle which differ; the litter mixed with such dung will be the same in both cases. Now, some experiments

made in the laboratory, on the pure dung and urine of cattle fed on turnips and oil-cake, appeared to me to confirm the opinion of the greater abundance of nitrogen in the produce of animals fed with the latter food. It will not do, however, to draw conclusions in such cases from a single analysis, so that I was anxious to have repeated and extended the experiments, but circumstances not within my own control have hitherto prevented my doing so. I would beg you however, to observe, that supposing it to be made out distinctly that farm-yard manure produced by oil-cake contains more nitrogen, than that from turnips, that still this would not embrace the whole question. It would if you were to buy the manure, when, of course, all that you want is to get as much nitrogen as possible in the 100 tons or any other quantity which you may wish to buy. But it is quite another thing when you come to produce the manure on your own farm. The question then is, not whether 100 tons of the one contain more nitrogen than 100 tons of the other; but whether the whole quantity of nitrogen produced by the one method of feeding is greater than the whole quantity of it produced by the other. Now, we have no experimental information on this point; but I think it may be doubted whether in this point of view there is any such difference, because, you will observe that though oilcake contains more nitrogen—in fact about 3 times as much as turnips—still there is a much greater disproportion in the quantities of these substances with which you supply the cattle. If you take away from an ox a certain quantity of turnips and replace them with oilcake, you do not allow an equal weight, but perhaps not more than one-fifth of the latter substance; so that in fact, the ox fed on oilcake actually on the whole receives less nitrogen than when fed on turnips. All these are matters which I do not give as facts, but as questions, which it would be most desirable to have determined by careful and repeated experiment; it would be a great boon to agriculture to have it set at rest, and I may be permitted to hope that the observations I have now made may be the means of inducing some one to engage in the inquiry. To pass then to another question—supposing cattle to be fed in exactly the same way, so as in fact to produce manure which at the moment of formation is of uniform quality, what are the circumstances under which that manure can be preserved with the least loss of its valuable matter? This question is one of the utmost importance, and calls for the discussion of so many points that it will be impossible for me to do more than refer to it very shortly. On some of those it would be difficult to enter without complicating the matter by opening up the discussion of other subjects;—I allude here to what is called box feeding, and feeding on boarded stalls, and sundry other modifications which,

independently of the feeding question, have been lauded by their supporters as producing greatly superior manure. I am too little acquainted with the practical results of any of these systems, which so far as I know have been only recently introduced into Scotland, to venture an opinion on their comparative merits. I have little doubt, however, that the manure produced must be superior in quality to the old farm-yard dung prepared in a most imperfect way. But what degree of superiority they possess has not been determined by any satisfactory experiments which have come under my notice. The matter must, in fact, be decided in the same way as other manure questions by ascertaining not merely the amount of valuable constituents present in the manure, but also the whole quantity produced in a given time. As regards the general question of the preservation of manure, I apprehend that the most important matter is its protection from air and moisture. In the way a common dung heap is made, we have, in fact, exactly the conditions to occasion loss of its valuable constituents. It is exposed to a more or less free current of air, which facilitates the volatilization of the ammonia as it is formed; and it is exposed to the falling rain, which washes out the soluble salts, and what ammonia the winds have spared, into the subjacent soil. It is true that the former of these sources of loss can be got the better of by the use of acids or of gypsum and mixing with dry earth; but when the ammonia is thus fixed, as it is said it is fixed only as regards *volatility*, for it is still *soluble*, and liable to be washed away by rain. In order to have farm-yard dung in the best state, it must be preserved under cover: and, my impression is, that the introduction of covered dung-pits is likely to prove of great importance. There seems to be no doubt that in this way manure, in whatever way produced, must be best preserved, there appears, indeed, to be but one objection, which is the expense of erecting a roof of sufficient extent to cover the whole manure of a farm. But, surely, in these days of cheap building, some sort of inexpensive cover may be contrived. In order to ascertain this, we should have to ascertain, by actual *experiment*, what is the amount of gain by having the manure kept under cover, so as to know whether it is sufficient to leave a profit on the expense of covering it. We have another matter to attend to, also, in the management of farm-yard manure—its fermentation, namely by which is meant the production of such a decomposition as converts the nitrogen present into ammonia. The importance of this decomposition depends upon the fact that by this means, we obtain a manure which acts with greater rapidity than one in which this decomposition has not been effected. The fact is, that the formation of ammonia takes place much more slowly, when it has been incorporated with the

soil, than when it is heaped up in the dung-heap; and, as the nitrogen must pass into the state of ammonia before it is absorbed by the plant, we require to effect as much of that change as possible if we are to have a manure of rapid action. Having said thus much of farm-yard, he would next speak briefly of liquid manures. The question was a very wide one, upon which he could not enter at length, and was to some extent an economic one; for to ascertain either the real or comparative value of liquid manures, they must be guided by economic results. As they would be aware, there existed a great variety of opinions as to how these were to be obtained. He was of opinion that liquid manure would be most economically employed, if it could be cheaply converted into the solid form. There was, however, only one process by which it could be done, and this was evaporation, and to effect that would be more expensive than its application in the liquid form. This was more properly a purely economic than a scientific question, and therefore he would not dwell on it. He had referred hitherto solely to the class of natural manures, and he had laid before them his view, that no artificial manure would ever prove a substitute for that of the farm-yard; but though that was the case, they might be, and he believed were, most important auxiliaries. Let them take the commonest kind of artificial manure—he meant of course, guano—the finest quality of which was the cheapest and best of the class. He said the cheapest and the best, and it must necessarily be so, because the constituents which were of greatest value to the agriculturist were given it in a larger quantity than they could be got in any other compound for the same money. His advice then would be to buy the best guano—never purchase inferior. The inferior was greatly more expensive. The decrease in the money value for which it might be obtained was nothing to the decrease in its valuable constituents, as compared with the better sorts. The Peruvian was the best kind of guano, and it was by far the cheapest. Farmers were exposed to much risk of imposition. In this matter, adulteration was carried on to an extent which it is difficult to credit. He had recently gone over the number of samples of guano which had been forwarded to the laboratory of the Society for analysis, to the number of 30 cases, and he found that out of that 30 there had been 9 samples of such a quality as he himself, if purchasing, would have been disposed to accept. And this gave no accurate idea of the proportion of good or bad guano that was in use. Numerous samples of good guano came to the office, but few of those that were thoroughly adulterated, because the vendors of such took care to keep as far as possible out of the reach of the chemist. Let them take guano of the best quality, and they would find that two substances entered largely

into its composition, viz; aramonia and phosphoric acid, the two substances, as he had previously stated, the presence of which was most valuable in farm-yard manure. Now, in Peruvian guano they would find about 17 per cent. of ammonia and of phosphate of lime, a compound of lime and phosphoric acid, 23, 24, or 25 per cent., according to circumstances. In inferior guanos, there might be found 23 or 24 per cent. of phosphate of lime, and one or two of ammonia; and this, instead of being sold at one-third of the price of the other, as it should be, was sold generally at two-thirds. Guano might be considered as the type of a class of manures, and bones might be taken as belonging to it also. The value of that kind of manure was dependent upon two conditions. Some used burned bones. Now in certain circumstances, that might be advantageous. The addition of phosphate of lime might alone be needed to certain soils. Such a case occurred in the pasture land of Cheshire. The application of bones to that exhausted soil operated almost as a charm upon it. The peculiar nature of the tillage under which it had been kept—all the butter and cheese raised upon it being conveyed elsewhere—reduced it to such a state that the addition of phosphate of lime acted perfectly, and was indeed beneficial. But in general such could not be the case, and therefore they should give the preference to bones that were unburned. There was another instance of a similar kind to which he might refer. In many cases he believed that bones were sold from which the glue had been extracted by boiling. This glue was a valuable commercial product. It was used in weaving, for stiffening yarn and other manufacturing purposes; and several manufacturers had large boilers in which this glue was extracted. The bones were sold afterwards at no diminution of price from that of unboiled bones. In conclusion, the learned Doctor presented a summary of the views he had advanced, reiterating that farm-yard manure could never be altogether set aside by artificial; but though such was the case, they were indebted to the latter for the great extension of cultivation that had taken place of late years. The reason why farm-yard manure was thus important, he hoped he had made plain, as also the necessity for further experiment to confirm or confute many views now broached and to a certain extent entertained. In fact, the observations he had made might be taken not so much as the results of experiment as the suggestions of those experiments that were requisite to test many of the theories to which he had alluded. The learned gentleman resumed his seat amidst much applause.

The Lord Provost then proposed a vote of thanks to Dr. Anderson for the very interesting lecture he had delivered.

The Duke of Roxburgh cordially seconded the motion, which was carried by acclamation.



# Agricultural Journal

AND  
TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, SEPTEMBER, 1850.

We have seen several visitors from the United States to Canada this summer, and a few Canadians who have made tours in the United States, and all concur in opinion, as to the capabilities of Lower Canada for agriculture, that they are generally superior to any of the Eastern States of the Union, with the exception that our winters may be longer, and more severe than in some of these States. Of the correctness of this favourable estimation of Canada, there cannot be any doubt. The only draw-back that we have been liable to, is in the production of fall wheat, that we have not grown it to any extent. We have this year seen a most beautiful field of fall wheat grown by James Logan, Esq., in the immediate vicinity of Montreal. It was in every way a superior crop. It may be replied that last winter was very favourable for fall wheat, and that success in growing under such circumstances, can be no general rule. We believe that if land was well drained and properly prepared, the wheat sown in time (at latest, previous to the middle of September) sufficiently covered either in drills, or tightly ploughed in, that fall wheat might be grown in Lower Canada. The great danger is in the Spring by freezing and thawing alternately, that the plants are thrown out of the soil, if not well drained. They are, however, liable to the same injuries in the United States, but they sow early, on summer fallowed land, and the wheat has a firm root in the soil before the winter sets in. We cannot admit that our country is inferior to any in North

America, but on the contrary, there is no doubt, that the cultivated portions of it, are capable of yielding a larger produce of corn, and cattle, acre for acre, than any part of North America, notwithstanding the length and severity of our winters. If we are behind or deficient in our products, it is our own fault, and the remedy is in our own power. The country or its products, are not to be estimated as they appear at present, but as they might be. Objections are made to our cattle, and our pastures, as being very inferior, but that is certainly not through defect in the natural quality of the soil or climate, or the race of cattle. We might have most superior pastures here, equal, we believe, to those of any country, as the lands are generally productive of natural clover the first year they are left unploughed. If we had excellent pastures what would prevent us from having good meadows, and with both these, why not have good cattle and sheep? We have heard objections urged to our cattle because they are not very large frame and bone, standing very high with great horns, but this sort of stock, we humbly conceive, would not be the most suitable or profitable for this country, *under any circumstances*. Short legged, small boned cattle of moderate size, will ever be most suitable and profitable for this country, and probably for any country. We do not wish to be understood as advocating the expediency of keeping very small sized animals. We only propose that our animals should be of moderate size, well shaped, small bone, but of large carcass in proportion to bone, and not to be *chiefly* legs, bones and horns. We admit that there may be small sized animals very unsuitable for meat or dairy purposes, but these are not the sort of animals to choose for usefulness or profit. It is only by careful selection and attention in breeding, that useful animals can be obtained. It could not be expected that neat cattle or

sheep, would be in superior excellence, where no selections are made for breeding, but all the females are allowed to breed, and at any age that they may do so. There may not be any objection that heifers of good size, and well kept, should breed, or have their first calf at two years old, but to allow those of small size to breed at that age is very objectionable, and completely checks their growth. With sheep it is the same case, they should not be allowed to breed until their second year, unless of good size, and well kept. Sheep at one year old, are not able to feed their lambs, if they are not of good size, and well fed. Farmers in the old countries, who are desirous of having good sheep, seldom allow the ewes to breed until after their first shearing. When this plan is found necessary in the British Isles, where sheep are much better fed, in winter and Spring, than in Canada, it may be imagined how much more necessary it is here, if we desire to have fine stock. It may be answered that it would not be profitable to allow sheep to remain the first year without breeding—but we would observe, that when lambs are allowed to breed the first year, they will not produce so large a fleece of wool, their growth may be checked, and they may not raise a lamb after all. The lambs or calves of young cattle, or sheep of one year old, are seldom of good quality, or fit for raising. Some farmers may so keep their stock at all seasons, that it might be quite proper to deviate from the plan we submit. For the generality of farmers, however, we conceive it would be their interest to adopt the plan we suggest, in breeding cattle and sheep. There is nothing to prevent us having a useful and profitable stock of cattle and sheep here, without incurring any great expense, except the observance of rules that are manifestly required in every country in the management of

cattle and sheep, to have them of good quality and profitable.

We have frequently been told that it would be better that we should copy more for this Journal from American Agricultural periodicals, than from Agricultural periodicals published in the British Isles. We, however, are fully persuaded that we cannot find in any Agricultural publications, better, and more practical information on every branch of improved husbandry, than is to be found in those published in the British Isles. We make this statement advisedly, and as a practical farmer of long experience. We say now and we have always said, that the more closely we follow and adopt the best and most approved practice of British husbandry, the better, and more profitable will be our farming. We do not say that we should follow them in every thing, but we certainly may do so in most things with advantage and profit. There is not an Agricultural publication of North America that can teach us better systems of husbandry than we can find in British publications, and than what we have learned by practical experience all our life. We should hope that this Journal would be one to copy from on Agricultural subjects, rather than be a copy from other publications. We possess the very best means of information on the subject of improved Agriculture, we have had a long practical experience, and therefore, if we are capable of employing these advantages properly, this Journal should not be second to any published on the same subject in North America, and we trust it is not, and shall not. The farmers of Canada will find as good farming in their own country, as they can find in North America, we can assure them of that. The general state of our Agriculture is defective, and very much behind the improved system of the British Isles, but we certainly can receive as

good practical instruction in the art of Agriculture within the Province of Canada, as we can find on this continent. We may very well take upon ourselves to lead instead of following, and there cannot be any mistake that Canada is capable of doing so. Our soil and climate are excellent, and we possess sufficient of practical skill in the country to show an example, and instruct the ignorant in good husbandry. All that is required is to put our many advantages into practical operation. We need not go to seek instruction beyond what we possess within ourselves, if we make a good use of what is in our own power. All our Agricultural implements may not be of the best description, but we have some of the most essential, that cannot be surpassed, and there is nothing to prevent us having them all so, made upon the spot, from English models, that are the best in the world. There are not better Agricultural implements on this continent, than some that are made in Montreal, such as ploughs, harrows of various kinds, grubbers, carts of every description, churns, cheese-presses, and many other articles of excellent form and workmanship, not so much for making exhibitions at shows, as for practical use in the farmers' fields. We have seen a churn made in Montreal, worth all the churns we have seen in America. It combined elegance of form, size, strength, and excellent workmanship, and capacity to make over 100 lbs. of butter at one time. This is something like a churn for a dairy, and a correct picture of it would be worth giving in an Agricultural Journal. There is a commencement made in Montreal of manufacturing Agricultural implements, and we hope that in a short period we shall be able to show all the implements required in Agriculture, of the most suitable form and adaptation to their several uses, and of the best materials and workmanship. We forgot to mention our Fanning machines, and wood and wire riddles and

screens, of every size required for cleaning grain or small seed. All we have enumerated are the best of their kind, and capable of executing well, the several works for which they were made and adapted. We have no reason to be ashamed of ourselves. If we cannot show a very large number of implements, we can show the most material to the farmer of the very best description. We confidently hope and trust that ere long Canada will be able to lead in a good system of husbandry in North America, instead of following the example of any other country this side of the great Atlantic.

We have not been able to give any illustrations in this Journal, and we suppose this want has been complained of by some parties. The expense of procuring illustrations that would be worth having, would be considerable, and unless they were perfect, or gave a perfect idea of what they were intended to represent, we conceive they would be more calculated to do harm than advance Agricultural improvement. In the case of animals, we have seen lately, some illustrations pretending to represent certain animals and we look upon them as ridiculous caricatures, giving no correct idea of the shape of the animals that would enable one to form any just estimation of their merit. In the Farmers Magazine, published in London, that certainly possesses merit equal if not superior to any other Agricultural publication, they seldom give any illustrations, except two beautiful copperplate engravings of superior animals executed in the very best manner in each Monthly number. If there are any others given, it is very rarely, and only of some new invention, and they are executed in the best style. We receive some of the best Agricultural periodicals published in the British Isles, and they seldom have any illustrations, except those in advertisements appearing in them. It would be very de-

sirable certainly that *correct* drawings should be given of any *new* and *useful* inventions not known to farmers, or new and *approved* plans of farm houses and buildings, but we do not think that the Agricultural Journal should be made the medium of *advertising* for parties, unless such advertisements were paid for, and then there could be no objection to any number of illustrations appearing on behalf of the parties advertising, and on extra sheets that would not diminish the present size of the Journal of Agricultural information. Picture books are very amusing to children, who do not require that the pictures be very exact representations if they give a mere outline, and are well coloured. Illustrations for an Agricultural periodical, however, must be well and correctly executed, to make them useful, and should only be given of the most approved implements, the best constructed farm buildings, and new and useful inventions. Any parties who desire to have their implements or other articles they have to dispose of, made known to the public, let them give correct illustrations and descriptions of them in an advertisement for which they will pay, and subscribers to the Journal will be able to form their own estimate of them. This Journal should only recommend by illustrations or otherwise, such implements, plans of farm buildings, or other things as have received the stamp of general approval formed from practical experience. We have seen frequently, illustrations of implements appearing in Agricultural periodicals, that would be useless to a farmer, for any purpose but to look at, and serve no good purpose by insertion, except as advertisements for the manufacturer or vendor of the articles. We wish to be distinctly understood, not to object to illustrations being published, provided they are such as we have endeavoured to describe—calculated to increase the usefulness of this Journal, and to promote the objects for which it is published

—the advancement of Agricultural improvement in Lower Canada.

### AGRICULTURAL REPORT FOR AUGUST.

The month of August was very favourable for completing the hay harvest, and for securing any grain ready for cutting. With the exception of one week in the commencement of hay harvest in July, we have seldom seen a more favourable season for harvesting hay in good condition. In the week we mention, some hay was injured, certainly; but for the remainder of the hay harvest, there was no difficulty in securing the crop in the best condition. Hay is a material crop of the farm, and it is a great advantage to have it uninjured and well saved, which it may be, generally, this year. Heavy rain or showers upon hay in the process of saving, destroy all the best qualities, and render it of little value, except for manure. The weather was beautiful for cutting and securing wheat and barley, and we believe all the latter, and much of the former, is safely housed. Barley was not sown this year to the usual extent, in consequence of the low price paid for it last year, and the quantity raised is certainly short of former years, but it may be equal to the demand. Farmers, however, should not give up the sowing of barley, as it can be employed in feeding cattle and pigs, if brewers will not pay a reasonable price for it. It is much the best crop to sow grass-seed with, in laying down land, particularly when wheat is sown so late as the latter end of May and beginning of June. To sow grass-seed at that advanced season of the year, is very uncertain if the month of June is dry, and it is a great disappointment to a farmer, when he proposes, or has his land in a fit state to seed down for grass, to have the grass-seed fail. If he has to plough it again, and take another crop of grain, the land may not be

in good condition; and where a regular rotation is attempted, it is quite deranged. When land is prepared to be seeded down, we should prefer incurring the risk of sowing wheat early, if that is the crop to be raised, to deferring it to the latter end of May. It would be less inconvenience and loss to lose some of the wheat by the insect, than lose the grass seeds, and have the disappointment consequent thereon. Indeed, it is very questionable whether it is a good plan to sow grass-seeds and clover with wheat, if a good crop of wheat is desired. The young grass and clover growing up about the wheat, is a shelter for the wheat fly, and in wet seasons retains more moisture about the straw than is beneficial to the crop, and is apt to induce rust. When wheat is sown in drills, and hoed, as in England, they can seldom sow grass or clover seed with it, and hence land is not often seeded down for grass with wheat in a good system of husbandry, when a regular rotation is observed. There is certainly a difficulty here in regard to this matter, and we fear that wheat must continue to be the chief crop to sow grass seeds with, but in that case it may be advisable to sow early, so as to give a fair chance for the grass and clover seed. This year, from all reports we have heard, the early and very late sown wheat has been less injured by the fly, than that sown from the 25th of April to the 15th May. From our own past experience, we should have expected this to be the case. The wheat crop generally, so far as we have been able to ascertain, has not suffered much injury this year by the wheat fly, and will be a better crop than we have had for some years. A dry warm season, we have ever found, both in the old country and in this, to be most favorable for wheat. It is said that summers of the highest general temperature, always produce abundant crops of wheat in England, as this high temperature is usually accompanied with dry weather. On the con-

trary, a low temperature is generally accompanied by a wet season, and is invariably productive of inferior crops of wheat, both in the British Isles and in Canada. A dry season saves much labor, and prevents waste and injury to crops. In this latitude, we are not often liable to extraordinary or injurious droughts, and the driest seasons we have seen in this country, have been the best for the farmers. There are some complaints of their crops of wheat, occasioned by various causes, but this may be always expected until draining and better cultivation is more generally introduced. In many places last Spring, the lands were not in the best condition for sowing or producing a good crop. They continued wet to a late period, and before they were fit to sow, the soil became so excessively hard, that it was impossible to harrow them sufficiently to form a good seed bed for the grain to vegetate in, and much of the seed failed from this cause. The same causes exist every Spring in a greater or less degree, and have been productive of similar results to those we have stated. We hope, however, we are correct in reporting very favorably of the crops generally, and an early harvest, as this undoubtedly is, is a most certain proof that the crops are better than they would be of a late harvest—at least we have ever found it so. In Lower Canada we have not had any sprouting of grain in harvesting up to this time, and this is a great advantage.

To harvest beans so that they will keep in good condition, is very difficult. In England they put a funnel in the centre of the stack to give a free circulation of air, and this prevents any injury to the beans, and admits of their being harvested much sooner than they could otherwise be. The funnel is sometimes made of cast iron, but generally of three poles of wood joined together with small spars, nailed on at about a foot apart. Where there is a sand, the funnel is placed upon the frame in

the centre of the stack, and the stack is built round them. Where there is no stand, there may be a channel formed of stone, or of wood under the bottom of the stack and the funnel placed upon. The air would go through this opening and through the funnel in the stack, and keep the beans from heating or injury.

Upon the whole, we can safely state, that we have not seen a crop of grain this year that was not fully as good as could be expected in proportion to the state of fertility, cultivation and management of the soil for the crop, and what more could reasonably be expected, unless crops were to be produced without any cultivation for them. We have seen and heard of symptoms of the potato disease appearing in the stalks or vines of the potatoes; but we believe that the tubers are not yet affected, and should dry weather continue, we may hope that the potato crop will escape the disease. We do not expect that in this dry weather the crop will be very large, but a moderate return of sound potatoes is much more desirable than a larger crop of potatoes that would be unsound. Farmers who are anxious to grow large crops of potatoes would be likely to incur loss instead of profit. Early planting will be the best security against disease, and making use of special manures, rather than farm-yard manure. We have no doubt that potatoes may be grown but not by the same cultivation and manuring that was practised successfully before they become diseased, and by the cultivation and manuring that has produced the disease. We have never seen the vines of the potato crop look more luxuriant than they did this year. The vines may wither and dry without disease affecting the tubers, but after this takes place the tubers will not increase much in size. There is a general complaint this year of the failure of the turnip crop by the fly, or at least seed that has been sown two or three times has been as often eaten by the fly the moment

the plants have appeared. This is a great annoyance and disappointment to a farmer, and one that we are very liable to in this country. It is most essential that soil for turnips should be well pulverized, and finely broken down—that it should be moist when sown—that it should be limed with about 40 bushels to the acre, previous to drilling, or sowing broad cast—that special manures, such as guano, bone-dust or ashes, should be applied instead of farm-yard manure, or applied with the latter—that a rapid vegetation of the seed should be obtained if possible—so that the plants may soon come into the rough leaf. Moist or peat soil is less liable to the fly here than upland or sandy soil. When the weather is dry at the time of sowing and for some time subsequently, the young turnip plants are very liable to be injured. In England it is found that by mixing the Swedish and White turnip seed, the fly will destroy the White, and the Swedish will escape with little damage. The experiments are worth trying. Turnip seed is not expensive, and by sowing some extra seed of a different kind from the variety sought to be raised, and of the kind the fly prefers, it would not be difficult to hoe out any that remained after the danger of the fly was passed. There is no better variety of turnip for food for animals or for keeping during the winter, than the Swedish, and we believe they might be grown by careful cultivation, and adopting the precautions we suggest. Steeping the seed of the variety of turnip desired to be grown in train oil, and drying it with sulphur, would also be a good plan, and only steeping the seed sown to feed the fly in soft water. The latter should be done in order that the plants would appear as soon as the plants from the seed steeped in oil. It might also be proper in case of steeping in this way that the seed should be sown separately, that for the food of the fly on the sides of the drills. This method would

give additional trouble certainly, but perhaps would not cost much over a dollar the acre, and this would be amply compensated by having the first sowing safe and in time.

There is a greatly increased quantity of Mangel-wurtzel, Carrots and Parsnips sown now in Lower Canada, over what was sown heretofore, and this is a certain indication of improvement in our husbandry. We do not expect that root crops will ever be cultivated here in the same proportion to grain crops that they are in England, but it would be very desirable that every farmer should cultivate some. If it was possible the land should be manured the previous fall and well drained. This would keep the soil open, and it could receive all the working it would require in Spring as soon as the snow and frost was gone, and the seed could then be early sown, which is most essential to good root crops. If our lands are not well prepared in the Fall, so as to keep them as dry as possible, and drained, so that the water shall pass off of them in the Spring without obstruction, we cannot sow in time or expect good crops. The growing seasons are very short the most favourable years, and we should certainly strive to be prepared to give our crops the whole benefit of the growing season. How can we expect good crops if we do not sow until mid-summer? With the exception of turnips, and buck-wheat, there is not a crop cultivated by the farmer that should not be sown in April and May, and as early as possible in these months. As to the wheat, we would not take upon us to recommend early sowing for all, least the fly should damage it, but we would have no hesitation to sow early if the land was in a fit state. As we before observed the most dangerous time is—sowing between the 25th of April and the 15th of May, and we should, prefer in our own case to sow previous to the first, or subsequent to the last of these periods. Oats, peas, and potatoes, cannot be sown too early after the

land is fit. Barley should not be sown before the weather becomes fine. We have never seen a good crop of barley when the sowing has been immediately succeeded by a very heavy fall of rain, unless the land was very dry indeed, or thorough drained. In England they endeavour as much as possible, to check weeds in the Fall, by destroying their roots, so that they shall not be in the soil to sprout and grow in Spring before or with the cultivated crops. Here, on the contrary, we make no effort to check the growth of weeds in the Fall, and consequently in the greater part of our lands, they must be continually on the increase. By summer fallowing, well, and properly executed, weeds might be effectually destroyed. Any farmer might summer fallow eight or ten acres in the year, if he would resolve to do so, and the whole farm might soon be got over in this way, and be put into good condition. We do not see how anything like a regular rotation of crops can be established here, without introducing summer fallow. Ten acres treated in this way, might be seeded down with clover and grass, for meadow, and it would then be in a clean and productive state, until it would be required for ploughing again, when it would be clean for any crop to be sown in it. There is an objection made to summer fallow by parties who pretend it is an unnecessary waste of land for a year, and contrary to the principles of good husbandry. However this objection might have weight in the British Isles, we do not consider that it applies here, where so large a portion of the lands is left in nearly a state of waste every alternate year. There is another objection urged, that in our hot summers, the fertility of the soil is evaporated by exposures to the sun in a ploughed state. This we conceive is a great mistake. Any farmer may see, that in the driest periods of the summer, by stirring the soil about the plants of green crops, an immediate improvement will be observable in

the plants. Ploughing and working the soil in summer, instead of exhausting it, causes it to attract fertility from the atmosphere, from whatever cause it may be, greatly adds to its fertility, and its fitness and capability for producing a good crop.

The very dry weather we have had in August, although favourable for harvesting has had a considerable effect upon the late sown crops, in hastening them to maturity, we fear, in many cases, rather prematurely. The grass and pastures have been very much dried up, and will not recover, until there is a considerable fall of rain. The markets are well supplied with meat—butter, and cheese, the latter of better quality than usual, and much of it of Canadian manufacture. This is as it should be. We might make butter and cheese here for exportation to a large extent, and it would pay well. Suitable dairies, good dairy-maids, skill, attention and cleanliness, are the grand requisites to insure good butter and cheese. It will not do to make good butter and cheese one time, and not another, as this will destroy the character of all. The most careful attention is to be observed constantly to secure a regular good quality at all times. In conclusion, we have abundant cause of thankfulness to a Bountiful Creator, "Whose goodness does the circling year" "With fresh returns of plenty crown!" and for giving us a healthy season. These, the greatest of all earthly blessings, are enjoyed by the farmers of Canada in as great a degree as those of any country on earth, in every instance, where they perform their own duty properly.

August, 27th. 1850

We are glad to perceive that the County of Terrebonne Agricultural Society have adopted the plan of paying all Premiums awarded for well managed farms, at their cattle show, ploughing matches, &c., "in useful and improved Implements of Agri-

culture,—superior breeds of young male animals—different species of grain, and any other useful article for the advancement of agriculture." If this mode of paying Premiums was generally adopted, it would have a good effect, provided always, that the Implements are of a good description and suitable for the use of the parties who obtain them. There is also, great caution to be observed in the selection of animals, that they may be good, and suitable for the use of parties to whom they might be awarded, or it will not be satisfactory to the parties obtaining them. As regards samples of seed there is no difficulty, except that they be clean, and of unmixed varieties. Awarding choice male animals will be the most difficult matter to manage, first, in obtaining suitable ones, at a fair price, and then in giving satisfaction to the competitor to whom the animal is awarded. This may all be provided for by Regulations of the Society which we have not seen. There is a numerous list of Premiums, and no less than 12 for well managed farms all of them open to Canadian farmers, and only 6 of them open to other than Canadians. There are no Premiums offered calculated to do more good than those for well managed farms, under judicious regulations and restrictions. We humbly conceive that it is very objectionable to allow parties to compete for different crops, and for well managed farms at the same time, and to be awarded Premiums for both. This is not allowing competitors a fair chance, and appears very like the "prize catching" system, that should be prevented if possible. If a good crop of any kind happens to be growing upon a farm that obtains a prize for being well managed, this good crop is a part a part of the result of good management and is not we conceive entitled to a separate premium. We do not see what is to prevent the best managed farms to obtain all the prizes for crops also, and cut out all other



competitors. If a farm be generally well managed it is probable that each crop upon it will be good, or at least better than any crop growing upon an ill-managed farm. These matters require consideration to maintain the character of Agricultural Societies, and their general usefulness and popularity. Any farmer obtaining an award for having the best managed farm should be perfectly satisfied with that honour, and leave other Premiums to encourage parties that are less fortunate and probably less skillful. We should be sorry to propose anything unreasonable but we feel persuaded the more general the competition that is allowed by the regulations of Agricultural Societies and the more widely the Premiums are distributed to farmers, the more useful their action will be, in encouraging improvement. The County of Terrebonne Cattle Show is to take place at the Village of Ste. Thérèse de Blainville, on Wednesday the 25th September instant.

An attempt has been made in July last by the County of Montreal Agricultural Society to establish a Fair, and a considerable number of animals were upon the ground, (the Old Race Course, Mile End,) for sale and for show. We did not hear whether many sales were effected, but we hope the Society will persevere in their intention of holding another Fair in the Fall. The month of May would be the most suitable period for the Spring Fair, and, perhaps, early in October, for the Autumn Fair. It would be a great convenience to farmers and others who require either to sell or to purchase animals, to have regular Fairs, as in the Old Countries. A variety of animals would be brought together for selection from to suit all parties, and much time would be saved. The Montreal Market is a very uncertain one to sell or purchase store animals in, and a larger portion of the animals exhibited are the greatest trash ever offered for sale.

We willingly give insertion to the communication of Charles Treadwell Esq, which will be found in another column, and we recommend its perusal to subscribers. When a provision has been made by the Legislature for representing Canada at the great exhibition in England next year, every thing should be done to make this representation creditable to Canada, as it certainly might be. We have always thought it would be well to encourage the writing of Essays on different subjects referring to the Capabilities, Agriculture, Manufactures, Commerce, &c., of Canada, and we should rejoice to see encouragement held out to write Essays on all these subjects. The Royal English Agricultural Society apply a considerable amount annually to this purpose (£300). There are 4 Essays annually for the best on the Agriculture of four several counties, and by this means they have now published Essays, we believe, on more than half of the English counties, and these Essays contain the most valuable information and instruction. They offer £50 sterling for each Essay that is considered the best. Were prizes offered here on the same plan, they would be productive of much good. It would not be necessary that we should have one for each county. One would be sufficient for each section of the Province. The application of public funds to these purposes, would not be mis-applied, but on the contrary, would give the true state of all matters to which they would have reference, and this information would be of the greatest advantage in developing the resources of the Province.

We have received from B.D. Johnson Esq, Secretary of the New York State Agricultural Society, the transactions of that Society for the year 1850. It is neatly bound in cloth, contains nearly 1000 pages of interesting and useful information, and several well executed Illustrations. It is altogether exceedingly well

got up, and highly creditable to the Society, and to their Secretary, Mr. Johnson who has prepared the work as Editor of it. The Lectures of Professor Johnson, delivered last year when in the State of New York are all given, and add greatly to the value of the work. We shall avail ourselves occasionally of the "Transactions" to copy what we conceive may be interesting to Canadian farmers. We beg to return the thanks of the Lower Canada Agricultural Society to the New York State Agricultural Society, and to their worthy Secretary, Mr. Johnson for their "Transactions."

The District of Montreal Cattle Show we believe is to take place at St. John's on the 9th October next.

We did not receive any notice of it, but accidentally saw the advertisement in the *St. John's News*.

The following we copy from the *Albany Cultivator*, for May last, under the heading:—*Improvement in Connecticut*—Farmers in Canada, may, if they can, produce such returns as it is reported they do in the United States. We confess we have never seen any equal to them in Canada yet:

"Our grass lands, lying in the vicinity of our main street, produce on the average, four tons to the acre, both crops (we always cut two crops per year); one field that was actually weighed, produced over five tons to the acre; and there are others which will equal that. There were 3 acres of oats averaged 86 bushels per acre, one acre of which being limed produced 92 bushels. Of corn one single acre produced 136 bushels, a piece of 3 acres produced 116½ bushels to the acre, weighing 60 lbs the bushel; another piece of 6 acres, produced on an average 102 bushels per acre. \* \* \* We can show cows from whose milk at grass alone, 2 lbs. butter per day are made." A cow is said to have produced £25 12s. 6d. in the year by her butter, and a calf sold for 6 d llars, the quantity of butter produced was 368 lbs. "Large Farming in the West," James Davis of Waverly, Ross county, Ohio, cultivates

1800 acres exclusively in Indian-corn, and had last winter, a corn-crib filled, which was *three miles long*, ten feet high, and six feet wide. It is stated further, that on the Great Miami Bottom, about 25 miles below Cincinnati, there is one field, (belonging to several owners,) seven miles long by three miles broad, which has been regularly planted to corn for nearly half a century. In the Wabash Valley, there is a corn field ten miles long.

These are surely surprising statements, and it would be worth a journey of even 1000 miles to go and see how a farmer in the West, where labour is scarce and dear, can manage to cultivate and harvest properly, one two or three thousand acres of Indian-corn. We have noticed other products, of potatoes for instance, and we believe that the quantity reported would more than cover the whole surface of the land, they were grown in. We have certainly better land in Canada than we have ever seen in the United States; but our products are awfully behind.

#### ON SAXONY SHEEP.

PERFECTION should be the aim of all; and as the Saxony sheep have been brought to the highest state of perfection, as producers of extra fine wool, it is my desire to make the description so plain that a young wool grower, who observes these rules, in buying or selecting for breeding, will soon have a good flock.

First comes the description of a pure blood Saxon buck. He should be of a medium size; (and I consider a medium sized buck to be 3 feet 9 inches from the nose to the root of the tail,) around the body 3 feet 2; around the flank 3 feet 6; from the breast to the hip 2 feet 6; in height 2 feet 3; he should be a little longer than a Merino, and not quite so heavily built. The back almost straight; broad over the kidneys; body round; the neck starting almost level with the tops of the shoulders; tapering and becoming round towards the head. The head small and neatly set on; no loose skin on the upper part of the neck, or very little; the hoofs short and pointed; well quartered, strong, active and spirited; his eye bright; pleasant countenance and tame; the skin smooth and healthy looking. When walking with his side to you, he should look finished and gay. He should look and feel woolly not stiff nor hard, but soft. The same rules should be observed in selecting ewes, only they are a size less.

The next comes the description of his wool. Fine wool on his forehead; wool on his crown, fine, short; downy looking wool on his cheeks; the under part of the neck as fine as possible, and crimped. The wool on the body to be as even as possible all over, and should be crimped 24 to 28 crimps to the inch; the crimps should run plain and evenly across the sample, and up to the top, resembling crape. It should be fine, soft, thick set or compact on the sheep; should be so that it will stand straight out, showing small strands or divisions on the surface of the fleece; the belly well covered with fine wool; the hip wool soft and crimped. The wool should be a clear white or cream color; moderately yolk, and the surface of the fleece a little dark. There is a very good kind of wool, that is very fine and close, in which you cannot trace the crimps—you must decide by the smallness of fibre. The fleece when shorn, its felting properties should keep it united; when spread, resembling a spider's web; it should be soft and easy rolled: the length of wool after it is washed and shorn, is from 1.12 to 2 inches.

When a young wool grower goes to select he should keep the above described sheep or some other model sheep before his mind; it would help him to have precisely one-fourth of an inch marked on his thumb nail, to lay the sample on and count, and if they count six or seven crimps in that space they are very good. You should cut the sample with scissors, for pulling them injures the wool and the sheep both.

When the wool is well crimped, it is superb. Sheep that are soaked and washed under a waterfall until the wool is pure and clean, will average 2 1-2 lbs. per head—if washed in the old way, they will average 3 lbs. You can have your sheep exquisitely fine, or fine and heavier fleeced, just as you select them to breed from.

Remember, 'like begets like.' Be careful to guard against the following faults: Coarse, hairy faces; coarse hairs or uncrimped wool on the under part of the neck; stringy on the top of the shoulders; bareness of the belly; coarse hip wool; and coarse hairs on the inside of the thighs; the skin pale or covered with spots; slab-sided, poor on reasonable keeping; sunk, in the neck; a little coarse; low on the side.

In conclusion, try to have your sheep with as many of the good marks as possible, and very few of the bad ones. Annually select, fatten and sell faulty sheep to the butcher. By so doing, you will have the profit and pleasure of having a fine and beautiful flock.

**MECHANICS.**—Of all the branches into which Natural Philosophy is divided, mechanics have proved the most useful to agriculture. No doubt any labourer may work any machine that answers the purpose it is constructed for; but

without a knowledge of this science he cannot understand the *principles* upon which any machine is constructed, nor can any machine be properly constructed but in accordance with those principles. As implements may be characterised as the right hand of agriculture, mechanical science, in improving their form and construction, may be said to have given cunning to that right hand; for, testing the strength of materials, both relatively and absolutely, it employs no more material in implements than is sufficient to overcome the force of resistance, and it induces to the discovery of that form which overcomes resistance with the least power. Simplicity of construction, beauty of form of the constituent parts, mathematical adjustment, and symmetrical proportion of the whole machine, are now the characteristics of our implements; and it is the fault of the hand that guides them, if field-work is not now dexterously, neatly, and quickly performed. In saying thus much for the science that has improved our implements to the state they now are, when compared with their state some years ago, I do not aver that they are yet perfect; but they are so perfect as to be correct in mechanical principle, and light in operation, though some are not yet simple enough in construction. Many indeed may yet be simplified in construction; and I consider the mechanist who simplifies the action of any useful implement, thereby rendering it less liable to derangement, does as good service to agriculture as the inventor of a new one. Such a result may at all times be expected; for mathematical demonstration is strictly applicable to mechanics, whether to the principles on which every machine operates, or the form of which it is constructed.

Were mechanists to pay more attention to principles, and less to empirical art than they commonly do in several districts, implements would soon assume the form most consonant with the demonstrations of science. As it is, modifications of construction and unusual combinations of parts are frequently attempted by mechanists; and though many such attempts issue in failure, they nevertheless tend to divulge new combinations of mechanical action. It is desirable that every mechanist of implements should understand practical agriculture, and every farmer study the principles of mechanics and the construction of machines, so to their conjoined judgment and skill might be exercised in testing the practical utility of implements. When unacquainted with farming, mechanists are apt to construct implements obviously unsuited to the work they are intended to execute; so that having been put together after repeated alterations, and probably at considerable expense, the makers endeavour to induce those farmers who are no adepts at mechanics to purchase them, and after some unsatisfactory attempts

they are put aside. Were farmers acquainted with the principles of mechanics, their discrimination would form a barrier against the spread of implements of questionable utility, and only those find circulation which were obviously simple, strong, and efficient. It is not easy to invent implements possessing all those desirable qualities; but, as they are always exposed to the weather, and the soil is ponderous and uncouth, it is necessary they should be of simple construction. Simplicity of construction, however, has its useful limits. Most farm operations being of themselves simple, they should be performed by simple implements; and all the *primary* operations, which are simple, requiring considerable power, the simple implements should also be *strong*; but complicated operations, though stationary, require to be performed with comparatively complicated machinery. Operations that are both complicated and locomotive should be performed with implements producing complicated action by simple means, in order to avoid derangement of their constituent parts. The solution of this last is a difficult, if not impossible problem, in practical mechanics. The common plough approaches more nearly to its practical solution than any other implement; yet that wonderful implement, executing difficult work by simple means, should yet be so modified in construction, as to give the ploughman a greater command over its motions. These considerations tend to show, that the form and construction of implements, and the circumstances in which they may be used, are still subjects affording scope for mechanical contrivance.

In viewing the construction of all machines, an important circumstance to be considered by the pupil is, the resistance among moving parts which arises from *friction*; and in solid structures, generally, the forms and positions of parts have to be adjusted to the *strength of materials*, and the strain which the parts have to bear. This consideration should lead the pupil to become acquainted with the strength of materials; and, as a farmer, he will have much need to put such knowledge in practice when he comes to receive the work executed by the carpenter and smith.

On considering machines, he should also avoid the common error of supposing that any combination of machinery ever can increase the quantity of power applied. "What an infinity of vain schemes—yet some of them displaying great ingenuity—for perpetual motion, and new mechanical engines of power, &c.," exclaims Dr. Arnott with reason, in his *Elements of Physics*, "would have been checked at once, had the great truth been generally understood, that no form or combination of machinery ever did, or ever can increase, in the slightest degree, the quantity of power applied. Ignorance of this is the hinge on which most of the dreams of

mechanical projectors have turned. No year passes, even now, in which many patents are not taken out for such supposed discoveries, and the deluded individuals, after selling, perhaps, their household necessaries to obtain the means of securing the expected advantages, often sink into despair, when their attempts, instead of bringing riches and happiness to their families, end in disappointment and ruin. The frequency, eagerness, and obstinacy, with which even talented individuals, owing to their imperfect knowledge of the fundamental truths of mechanics, have engaged in such undertakings, is a remarkable phenomenon in human nature."

TO TAKE HONEY FROM BEES.

SIR—As I read in one of your late papers a query respecting the way to take honey from bees, without smothering them, and as I think that a successful way of doing so is very easy for every bee fancier to undertake, I wish to let you know the plan which I always adopt, and which if you think worth a place in your paper, you are very welcome to.

The simplest way, and the one by which I invariably take the honey away, is, I provide, in the proper season, a kind of fungus, which grows in old grass lands (we call them puff-balls,) and having carefully dried them in an oven, I put them in a paper bag over a fireplace, to keep them dry until wanted. I also have a tin box, five inches square, with a very close-fitting cover; and soldered to each end of this box, I have a small tube about six inches long; when I wish to take the honey away, I place my hive on a board or flag, and having lit four or five of the puff-balls, I put them in my tin box, and cover it close. I then insert the end of one of the tubes that are fixed to the box, under the rim of the hive, about two inches in. I place them in a damp cloth round the bottom of the hive, to keep in all the smoke, I then blow gently through the other tube. The smoke of the puff-balls will, by this means, be driven from the tin box, through the other tube, into the hive; in a short time the bees will become quite intoxicated, and fall from all parts of the hive on the board or flag on which the hive is resting; I have ready at hand another hive properly dressed with sweet cream, which I place over them after I remove the full hive; they will, in a short time, recover, and ascend to the top of the hive. I then remove them to their permanent stand. I have tried other, but it is so very difficult to ascertain the quantity of ether to administer, or the time to withdraw the vapour, before a number of the bees are destroyed, that I have invariably used the puff-ball in all my experiments.

By the use of the puff-ball I can join two weak stocks, and make *one strong one*, which is of more value than a dozen weak ones; the way I do so, I will at a future time be very happy to communicate to you, but at present I fear I have

trespassed too much on your valuable time.—  
Yours, &c., JAMES KINGSTON, *Lowertown Lodge,*  
*Skull, June 3, 1850.*

**WAGES, AND WORK IN THE TIME OF MILTON.**  
The wife of Milton hired a little boy that was glad to receive three pence a week. His employment was to fetch the milk, post the letters, get flour from the mill, and barn from the brew-house, carry pies to the oven, clean boots and shoes, bring in wood, sweep up the garden, roll the grass, turn the spit, draw the water, lift boxes and heavy weights, chase away beggars and infectious persons, and any little odd matters of the kind.—*Selected.*

### DISEASE OF FEET IN CALVES.

“We lost a great number of calves for some years past by a disease they took about the feet; their hoofs grew so fast and so soft, that they could not walk with them, although I pared them now and then—and I have one this year, that has the same disease. I was advised to rub vitriol to the diseased part, which I did. I cannot say yet whether I can cure it or not, but I see that the disease is not making such rapid progress since I began to apply the vitriol to it. Perhaps when you are going your rounds, you will call at J. & R. Radmes, who sell medicine for sheep, and ask them if they sell what is applied to the disease called the ‘rotfoot in sheep.’ I think that the disease in the feet of the calves is something of the nature of the rotfoot in sheep.”—S.

“I am much indebted to you for the trouble you took in inquiring about the calf. There is nothing putrified or broken about the feet or hoofs, but the hoofs grow uncommonly fast, and are soft where they become attached to the skin, but quite hard towards the point, and if not pared would turn upwards; if any thing they are harder than usual, so that the calf does not lay his weight upon the point of the hoofs as other calves do that are not troubled with this disease. When he is going he stretches his feet forward, and lays his weight upon the back part of the hoofs as if a person were walking upon his heels. So far as I can judge from the experience I have gotten about the disease, it arises, or is caused, by the over-growth of the worm that lies between the hoofs, for I suppose that you, and particularly Professor Dick, are aware, that in every beast's foot, with divided hoofs, there lies a worm in the fore or upper part where the hoofs divide from the legs, which is always taken out by those who prepare the feet for human food. Although the said worm is naturally but the size of a small bean in a calf, yet it grows to such an enormous size that it goes back through the feet until the end of it lies close to the skin in the hollow part between the small hoofs at the back of the feet. In some of the calves that

had the disease, I saw the end of the worm, which moved to the touch, and appeared to come from the direction in, or through the foot where the above mentioned worm lies, and I took an awl, put it through the end of the worm, and drew it out as far as it would come, then burnt it off with a red hot iron, as close to the feet as I could, without coming in contact with the sinews, &c., and that without curing the disease. One of my neighbours told me that he cured two calves by an advice which he got, viz., first rubbing vitriol to the hoofs, then whale oil to keep the vitriol from burning the feet. I did that to one I had last year: it stopped the disease, but the vitriol destroyed the joints close to the hoofs, so that the calf died, but I am more cautious in using the vitriol to this one. It checks the disorder, so that it is not making such progress, but it does not appear to remove it. I am using the vitriol as advised by the Professor, and will do so till I hear from you again. There are various reasons given as the cause of bringing forward the disease; some say that it is caused by the calves lying on hot dung, but that cannot be, for no dung will heat while beasts are trampling upon it. Others say that it is caused by their lying on wet dung, but we generally keep them dry—at least as dry as we were wont to do before the disease was known in this quarter. A third party says that too much running will cause the disorder; now the calves all run a good deal when they get out first and the one I have diseased took the lead among the calves when they first got out, and certainly ran a good deal; and I never saw two calves that ran so much as the first two that took the disease with us about 20 years ago. They would run almost the whole day through the arable land, and it is shortly after they get out first that the disease makes its appearance. I may say in conclusion, that the diseased one this year is of the same cow as the one previously affected.”—S.

*Remarks.*—It appears to me that the disease in the feet of your brother's calf is very like what we call founder which is an inflammation of the sensitive laminae of the foot around the sides and toe. The softening may either be an effect of it, by causing a throwing out of a soft porous horn in great abundance, or the back parts of the feet are softened by the calf resting on the soft wet dung. I think the best thing that can be done is to have the toes or fore parts of the hoofs, pared down almost to the quick; indeed, even if the quick were exposed and bled a little when the disease first appeared it would do good, poultices of bran may be of much use; but, in the case you now mention, which has been going on for a length of time, they are not likely to be of much service; and after paring down the hoofs sufficiently, a solution of any mild caustic, to act as an astringent will be the most likely remedy. If the sulphuric

acid he is using is diluted with five or six times its weight of water it will do; or he may dissolve an ounce of sulphate of copper in a quart of water, and try it; if necessary, the feet may be wrapped, inclosing a little tow and tar; but the main thing is to pare the hoofs properly and in that case it will perhaps be found that the calf can walk quite well, and may be turned out into good dry pasture.—W. D.]

*Water for cattle.*—The Professor commenced this third head of his lecture by remarking that he believed it was a generally observed fact, that cattle liked the water of ponds, while they disliked that of limestone springs; that they preferred to quench their thirst in a green offensive collection of stagnant water, rather than in a running spring. In Bedfordshire he had seen cattle much relish a bad water filled with confervæ and animalculæ, which, however, was the only water to which they happened to have access. Farmers generally supposed that the cattle were fond of such water on account of the green, vegetable matter it contained; and a distinguished professor had explained the fact by supposing such water to be “meat and drink” for the cattle. It was certain they did not like hard water; and it gave a staring coat for horses when they were obliged to drink it; and when it was considered that water, in chalk districts, contained from 60 to 70 grains of carbonate of lime in the gallon, while London water (which was hard compared to others,) contained only from fifteen to sixteen grains, it would be obvious how much difference would be found to exist in different waters. He regarded a good supply of water essential to health; and thought it a point of great importance to ascertain the kinds of water most suitable to the animal economy, under different local circumstances. Professor Way concluded his lecture by expressing a hope that the members present would communicate to the meeting such cases of the practical effects of hard water, on the health of cattle, as it had been his object in the remarks he had then made, to elicit from them.

**CIRCUMSTANCES WHICH MODIFY THE QUANTITY OF LIME THAT OUGHT TO BE ADDED TO THE LAND.**

There are many circumstances, as I have said which will modify the quantity of lime that may most profitably be added to the land. Thus—

1°. *The nature of the soil* must be considered.  
 a. A light, sandy soil must not be so heavily limed as a stiff clay. This is a familiar fact to every farmer. Besides those purposes which the lime serves in the lighter soil, it is applied to stiff clays with the view of opening and rendering them more friable and mellow. This of course

requires the presence of an additional quantity. In a clay soil, also, the minute particles of lime are apt to become coated over with a thin layer of impervious clay which prevents many of them for a long time from exerting their full effect in promoting the growth of plants. For this reason also, a larger proportion is useful. Lastly, lime cannot be diffused through a clay soil so easily or so completely as through a light or sandy soil, and therefore it must be added in larger quantity, in order that it may be made equally accessible to the roots of plants.

Hence in the same neighbourhood, as in parts of Renfrewshire, where 2 or 2½ tons are considered enough for the hill-side (sharp or gravelly) land, 6 to 8 tons are considered indispensable on the heavy land of the bottoms.

b. Such again, as are poor in vegetable matter will bear less lime than such as are rich in decaying animals and plants. One of the uses of the lime is to combine with substances which are naturally produced during the decay of vegetable matter in the soil—the larger the quantity, therefore, of the dead roots and other parts of plants, the greater will be the demand for lime to perform this function. Besides, as dead plants afford the food on which new races of plants live, and as lime promotes the decay of the former and the preparation of the food they contain, it must be advantageous to the immediate fertility of the soil to add lime more abundantly when much vegetable or animal matter exists in the soil.

Still all soils, in which vegetable matter abounds will not bear in an equal degree the application of large doses of lime. Our dry, moorish heaths, covered with a black vegetable mould of a few inches thick, resting on a gravelly subsoil, often give excellent crops of oats, and even turnips and barley, when first broken up and limed, but afterwards become too light and open to grow oats and clover successfully. To such soils lime should not be added too lavishly; and means should be taken, by deep ploughing or otherwise, to mix up and solidify the surface soil, that it may contain on the whole a smaller per centage of organic matter than the few inches at the top usually do in their natural state.

2°. *The state of the soil* is also of great consequence. If the land be wet and undrained, a larger dose of lime must be laid on. The moisture, like the coating of clay above referred to, shuts out the air, and prevents the lime from having its full effect. The coldness of such soils also checks the decomposing action of the lime upon the soil, and causes the production of a larger proportion of acid matter—for both of which reasons more lime is required. Further, in wet land a portion of the lime not unfrequently forms insoluble compounds—muriates, silicates, &c.—which do not act in the usual way in bene-

fiting the crops, and thus also larger applications are rendered necessary.

If the soil be a stiff clay as well as full of water, then larger doses still be required; and if it be also marshy, and therefore abound in vegetable matter, very large applications of lime must be laid on, in order to obtain the full benefits it is capable of producing.

3°. *The kind of cropping* is also of consequence. Green crops are benefited by larger doses of lime than crops of corn. In reclaiming boggy land it has been observed, that while the addition of above a certain quantity of lime lessened the after-crop of oats, a turnip or potato crop, if taken first was excellent in proportion to the quantity of lime applied. A similar remark applies to the ploughing up of lea. If corn is to be taken, the liming may be postponed, but, for a green crop, lime will generally be advantageous. By land which is lying in grass, less lime will usually be required in the same number of years, than by an equal extent in arable culture. Much, however, will depend upon the way in which the grass land is treated; and if it is cut for hay, more of course of everything, and of lime among the rest, will be required than when it is kept in permanent pasture.

4°. *The kind of husbandry followed.*—An improving husbandry, for example, will call for larger applications of lime. If, as means of improvement, the land be ploughed deeper, the lime will be diffused through a greater body of soil, and should therefore be present in greater quantity. Or if the land be drained and sub-soil-ploughed, with the view of removing noxious matters from the deeper soil, and of allowing the roots to descend, a more abundant liming may in the first instance be required—since it is desirable that some of it should find its way into the under soil, to aid in preparing it for the safe descent of the roots of the growing crops.

5°. *The form in which the lime already present, exists in the soil* is also a matter of much importance. The soil may contain 6 or even 10 per cent of lime in the state of silicate, and yet pay for the addition of a considerable first dose of *quick-lime*, because this silicate must itself undergo decomposition, through the joint action of air and moisture, before it can produce the good effects which follow from the use of lime. A reasonable per centage of gypsum may also be present, and yet the land may pay for liming; because the gypsum is not fitted to perform all the functions of quicklime, or of carbonate of quicklime, or of carbonate of lime in the soil. In this latter case, however, much will depend on the nature of the soil itself, on the kind of manure applied to it, and on the circumstances in which it is placed—points to which I may hereafter have an opportunity of adverting.

6°. *If the land has been previously limed*, a larger quantity is believed to be necessary to produce an equal sensible effect compared with that

produced by the first addition. This may arise from several causes.

a. If the land be nearly destitute of lime when the first application is made, a very remarkable effect will necessarily be produced, since a certain proportion is necessary to the ordinary fertility of the land.

On a second and third application, the land already contains more lime than at first; and therefore a larger quantity must be added if it is to come in contact with as many particles of soil on which it can act, as the first lime readily reached.

b. For instance, the whole quantity of that kind upon which it can readily act, may be less than it was on the first application; and hence the lime must be diffused through it in larger proportion, if it is to be brought in contact with as much of this vegetable matter, and produce as great a sensible effect as at first.

c. But the good farmer will not often expect to see upon his old-cultivated land a sensible effect produced by lime equal to that which is seen when it is newly brought into arable cultivation; the addition of lime from time to time, in good husbandry, being made rather to keep up the existing condition of a productive soil, than to add materially to its actual fertility. This point will be more fully discussed in a succeeding article.

7°. *The geological character and structure of a country* have also much influence upon the quantity of lime which its soils require; but this point is of so much interest and importance that it will be better to consider it in a separate section.—*Johnson's Treatise on Lime.*

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