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A SUPPLY OF AIR NECESSARY TO THE ROOTS OF PLANTS.

The main object of the practical farmer is to raise from the dead earth the living plant; and in order to do this, it has been found necessary in all countries, and in all ages of the art, to break up, and more or less to pulverise the surface soil. As this is the natural station for all our cultivated crops, and where they obtain a large portion of the necessary elemental food requisite for their development and maturation, certain conditions of the said surface become absolutely necessary. Moisture, warmth and air, in due proportions, are indispensable, both to the roots which are extended through the soil in search of mineral food, and to the stem and leaves which appear above the surface, one of whose chief functions being the absorption of gaseous matter from the surrounding atmosphere. An excess of moisture is commonly more injurious to plants, than the extremes of heat and air; for when a soil becomes saturated with water for any considerable time, air is in great measure excluded from its pores, and the slow and constant evaporation which is going on at the surface, keeps down the temperature to a degree inimical to the healthy progress of vegetation. For a soil, therefore, to be made porous so as to freely admit air, warmth and moisture, with the capability of any superfluous amount of the latter freely percolating away, constitutes an anxiom on which all our operations of ploughing, trenching, digging, draining, &c., are founded.

Soils, it is well known, vary much in their chemical composition and mechanical texture. The success of many crops depends as much upon the latter as upon the former; and in no case can the natural or artificial consistency of the soil be safely disregarded. Most of the winter wheat in Canada is raised on summer fallows; but the operation of fallowing is often so imperfectly done that a diminished crop of inferior quality is the inevitable result. Wheat, it is true, naturally covets a close soil; yet the deeper and more thoroughly it is pulverised, so as to allow air, warmth and moisture freely to come in contact with the roots of the young plant, the more freely will it grow, and the more abundant will be the produce. If, however, water should in any considerable quantity stagnate, so as partially to exclude air, and by surface evaporation produce cold, *underground draining is essential to the procuring of a profitable crop.*

That the contact of air to the roots of plants was always considered necessary, is evident from the oldest agricultural writers; but the principle was never so fully understood and acted upon, as it has been of late years. The first and most striking instance confirmatory of the opinion was the fact of large, full-grown, ornamental forrest trees having been killed by their roots being too deeply covered up with earth when leveling lawns; and planters and gardeners have long been aware of the injurious effects of planting as well as sowing too deep. Formerly it was thought that the earthy materials in which valuable exotic plants were to be placed could not be too finely sifted and mixed; whereas experience at length showed that the small particles of such soils soon run together and become a compost mass after heavy rains, thus operating against the extension of the young roots, and in great measure excluding the external air and moisture. Among coarser and looser materials, however, a considerable body of air was found to repose, and the more active fibres to extend much more luxuriantly than in closer and denser soils.

The gardener's improved practice is only another proof how much a porous soil and presence of air are necessary to the roots of plants; and yet we often see the most luxuriant vegetation produced by soils which are apparently very close in texture; such as alluvial soils and fertile clays. Both these descriptions of soils being composed of the finest atoms, become exceedingly close and compact if undisturbed; but when ploughed or otherwise periodically moved, the stirred portion attracts as much of the qualities of the air as suffices for the following crop. It is rather remarkable that while oak thrives best on a clayey subsoil, it does not seem to affect rich alluvial land, owing probably to its closeness of texture preventing all access of air to the place of the roots.

Aquatic plants, which live entirely submerged, although defended from external air, receive as much as they need from the surrounding water, which always contains a notable measure, besides nutritive bodies in solution, which form the pabulum of plants, whether aquatic or terrestrial.

Another tribe of plants are attached to the earth so slightly that their system of roots is nothing compared with the bulky heads sustained; and as these plants are mostly found on rocks, or on the driest tracts of country, it is evident that the greatest portion of their nutriment is drawn from the atmosphere.—Another tribe of curious and beautiful flowering plants is called Epiphytes; because they attach themselves to the stems and branches of trees, not to sustain themselves by extracting their juices, but to be supported in the deep shade and moist air of thick tropical woods. Some of these are called *air plants*, and grow as well in a basket without earth, suspended in a warm, damp, shady place, as if they were in their native habitat.

Thus it is apparent that atmospheric air is essentially necessary to plants, and as much so to the roots, as to the stem and foliage; and it is this fact, as already observed, that justifies all the means of cultivation which the farmer and gardener have recourse to with a view of rendering the staple of the soil more loose and consequently more permeable to all atmospheric influences.

There is one circumstance, however, which deserves to be noticed along with these general remarks; it is this, that all seeds require to be closely embedded in the soil, that is, they should be in close contact with the mould on all sides; and, that this should be completely secured, some seeds in particular soils require a mechanical pressure of the earth upon them, as wheat for instance. Now, we have only to consider that as the soil has been previously prepared, and more or less reduced to the finest practicable state, a considerable volume of air is incorporated therewith, and that this air, according to its temperature and the moisture of the soil, facilitates the germination of the seed, and continues to assist the development of the plant. To obtain this close embedding of the seed

on light, porous, soils, it is the practice to press it in, a practice which is found of service to wheat, peas, beans, and almost all small seeds; but which would be of no avail without the previous disruption and æration of the soil.

All these matters premised, it only remains to conclude with a general declaration that, in all our practices and means employed for the amelioration of the land, everything that can be added or taken away, every operation performed, and every implement used in the culture, should all have for their ultimate object, either directly or indirectly, the breaking up of the compact and impervious surface, so that copious and constant supplies of air may be freely admitted to the roots of plants.

MR. JONAS WEBB'S RAM LETTING.

The thirty-third annual letting of South Down Rams, from Mr. Webb's world renowned flock, in Cambridgeshire, England, took place on July 7th; a few particulars of which, gleaned from the very interesting and copious report in the *Mark Lane Express*, will not be unacceptable to our readers. The number of rams offered was 175, and the number actually let on the occasion 54; yielding a total receipt of £1,376 11s., or an average of £25 9s. 10d. per head; being £4 10s. over the average of last year. A four years old ram obtained the highest price—put up at 50 guineas, and let at 70 guineas to Mr. Rigden of Sussex, to which county several of the higher class animals went. It is curious that although this celebrated breed originated in this county, the flockmasters of Sussex find it beneficial to import more or less annually, from the flock of Mr. Webb in Cambridgeshire; affording striking evidence of that gentleman's skill, and the advantage of getting occasionally from a distance breeding animals, as well as seed grain. We observe that Mr. Webb's yearling rams yielded fleeces of wool, varying in weight between seven pounds and ten pounds eight ounces! Mr. Webb is in the habit of letting privately a large number of his rams, before and after the annual meeting. He said that he had just received an order to send a ram to the United States at 150 guineas.

The letting concluded, about 200 gentlemen sat down to an elegant dinner. Among the company we notice Mr. A. Dight, of New South Wales, who is about to take to that colony a number of Mr. Webb's short-horn cattle and Down rams. Mr. Luther H. Tucker, Jr., of the *Country Gentleman and Cultivator*, Albany, N. Y., was likewise present, whose reply to the toast, "The healths of our friends across the Atlantic," we deem worth subjoining:—

Mr. TUCKER said, in two respects Old England—for they were still fond of calling her Old England across the water—was so famous, viz., for her hospitality and for her agriculture; that while he was sure that neither could excel the other, he was equally sure that it would be difficult to find elsewhere an example of both similar to that which had been witnessed during the day. And when he saw so many gentlemen connected with the pursuit of agriculture, not as a recreation or as a means of spending money, but with something of that energy which had placed British commerce and British manufactures in their present proud pre-eminence, he could not but appreciate the solid basis on which English institutions stood, and the services which had been performed for agriculture by such gentlemen as Mr. Webb. American traders and merchants, when they wished to secure the best, had recourse to the achievements of British genius and the excellence of British products; and American farmers acted on the same principle. The prodigies which had been performed in the improvement of the sheep and swine, and the creation of such a breed as shorthorns in cattle, were no less triumphs of genius; and for whatever excellence Americans could boast in their show yards, for that kind of animals capable of producing the most beef, mutton, and

pork at the least expense of time and food, he most willingly and cordially acknowledged their indebtedness to English breeders, among whom he was most happy to find himself that day, and many of whose names were known all the way from France to Australia, as well as on the banks of the Hudson river where he lived, and the still more distant and almost boundless prairies of the Western States. He might conclude by expressing the pleasure with which he had observed that Mr. Cobden—who had just returned from a journey in America, and whom he had the pleasure of meeting there last spring—in his first speech after landing at Liverpool gave the fullest assurances derived from his own personal observation and knowledge, that the people of America still looked back to England—although perhaps as a grown-up and somewhat wayward boy might look back to the home of his fathers—with the deepest sympathy in all the progress she could make, with the utmost confidence in the good will of her inhabitants, and with the proudest anticipations for her future no less than for their own.

Correspondence.

REMARKS ON MR. CAIRD'S PAMPHLET:

ENTITLED "PRAIRIE FARMING IN AMERICA, WITH NOTES BY THE WAY, ON CANADA AND THE UNITED STATES."—NEW YORK EDITION, 1859.

MR. EDITOR—

Goethe has said, "It is not by attacks on the false, but by the calm exposition of the true, that good is to be done." Taking the above as an excellent rule of action, I have given Mr. Caird's Pamphlet, entitled "Prairie Farming in America," a very attentive perusal, and I think Mr. Caird deserves much credit for the candid way in which he has treated the subject of the British settlers' prospects in Illinois, in very many points of vital importance. The inferences, however, which may be fairly drawn from the facts and figures he has given us, are in many instances, calculated to produce a widely different result from that which he appears to have anticipated, and no doubt expects his readers to arrive at. Without dwelling upon the report that Mr. Caird is personally and largely interested in the Illinois Central Railroad Company, and their lands, I proceed to examine the merits of his pamphlet.

The prevalence of ague to which Mr. Caird has alluded in pages 11, 12, 28, 29, 40, 59, 64, 75, 95 and 96, New York edition, especially in pages 95 and 96, where he gives the experience of a leading physician of twenty years practice, cannot fail to be very appalling to intending emigrants who carefully peruse his work, especially as this physician plainly states that in his opinion "old people ought not to come (to Illinois) at all, as the ague is very fatal to them," and adds by way of solace, that, "Chicago (being an older settlement) was now almost free from ague, that typhus had taken its place in a greatly modified extent, and that pneumonia and rheumatism were the only other diseases that were severe." Candid and explicit as these warnings are, it may be fairly added, that the very great prevalence of ague and the total prostration with which it is accompanied, often extending even weeks and months together on these prairie lands is not sufficiently pourtrayed. It not unfrequently happens that whole families are so prostrated, that it is with difficulty any one member of it can be found able to alleviate the sufferings of the rest, and in remote situations it is often extremely difficult to procure aid from other families. The effects of this prostration are often very seriously felt in the delay and even non-performance of the necessary farm-work, the neglect of cattle, and often the partial loss of a season's crops. For this reason, if farmers *are determined* to settle on prairie land they should make arrangements for three or four or more families, to settle together, and, in charity, Mr. Caird should have suggested this; but it is my purpose to show that settlers in the bush of Canada have much better prospects in every way than in the prairies of Illinois, not only as regards the comparative freedom from ague, but for acquiring actual prosperity and speedy independence. In endeavoring to show this I will take Mr. Caird's own representations as the basis; although very great errors have crept into his work, seriously affecting the general character of Canadian soils and Canadian farming. The quotations of a few passages will serve to show how hurried must have been his ride through the country, how very erroneous the ideas

which he formed. At page 20 he says, "From Prescott to Kingston, and thence to Cobourg, the country is but partially cleared; very often the train shoots for many miles together through the primeval forest, a path having been cut in the woods for the railway track, and the felled trees and branches still lying where thrown, on both sides of the line." This latter assertion may be *literally* true, but Mr. Caird himself, as well as his readers, will be surprised to learn, that at least seven-eights of this very route is through a remarkably fine agricultural country; through lands held by the very best and most successful farmers, having very large clearances, comfortable dwellings, and out-houses, and good orchards. The counties from Prescott to Cobourg, through which Mr. Caird's route lay, contain 240,000 inhabitants. For twenty years there have been fine herds of Ayrshire and Durham cattle, little inferior to the best cattle in England, and even 40 miles back of the frontier, may be seen farms of from 200 to 400 acres, well cultivated, heavy crops, excellent horses, cattle and sheep. The Railway track was made through the rear part of their farms, purposely reserved "in primeval forest," for firewood; three-fourths probably more of their large farms being under cultivation. The Railway Company purchased the land *in rear* because the farmers did not wish their farms to be intersected by railroads, and they sold the land in the rear cheaper than they would have sold any other part of their farms. The quotation above given, shows the great danger of judging a country merely by a railroad ride; and the danger of *publishing* the impressions thus erroneously acquired, especially by so well known a man as Mr. Caird, is greater still.

This may be further illustrated by extracts from pages 26, 27, 28, and 29; and it is certainly much to be regretted that Mr. Caird remained so short a time in Canada, and took such a very cursory glance of the colony. Many of his remarks are truthful and valuable, but no individual, travelling as Mr. Caird did, *could* form a correct opinion of the agricultural status and prospects of Canada. At page 26, &c., he says, "the country from Hamilton to Paris is undulating, and seemed an easier and more fertile soil, very little of it is wholly cleared; certainly more than half is still an unbroken forest, but the trees are immensely tall and show the rapid growth which only a fertile soil could produce. Though this district is quite within the limit of the profitable culture of Indian Corn, a small proportion only of the land seems to be occupied by that crop. Its great value is everywhere admitted, but on this description of soil its cultivation demands too much labor. The last grain crop can hardly have been great; for in very few instances indeed, are ricks to be seen outside the barns, and they are not capacious enough to contain large crops," &c.

Had Mr. Caird journeyed through this country in any other way than by railway, he would have formed a much more correct opinion of the extent under cultivation; this he has very much underrated. Fully three-fourths of this whole district of country is cleared and enclosed, and a large portion of it highly cultivated. If there was little Indian Corn in 1858, it was because other crops promised to pay better, and the spring of 1858 was peculiarly wet and cold; but there is a very large extent of it this year, and although a little late it will prove an abundant crop. The absence of ricks outside the barn, as alluded to by Mr. Caird, is owing to the great abundance of timber, and the great facility with which Canadians construct large barns, quite sufficient to hold even very luxuriant crops. Every good Canadian farmer provides substantial covering for his whole crops, instead of having recourse to ricks with their temporary covering of straw. The material, except nails, they have within themselves, and most of them can help to build them. The work of building a barn 60 feet by 30, and 18 feet post, can be done for £40 stg.; and most good farmers have two if not three of these large barns, besides long sheds in which to store hay &c.; so that the absence of ricks is no criterion of deficiency, but on the contrary, their presence is rather a sign that the farmer is a new settler and as yet unable to put up the permanent covering for his produce, which old and successful farmers universally provide. As to Mr. Caird's assertion that on this "easier and more fertile soil" the cultivation of Indian corn demands too much labor, it may be safely urged that labor is cheaper in Canada than in Illinois, and that the corn crop is nearly as productive in the district he alludes to as it is in Illinois, and being of much superior quality sells at a much higher price. The fact is, that wheat in this district has been hitherto so fine and selling at such high prices that the growth of Indian Corn has been neglected too much for the welfare of the farmer. This very part of Canada which Mr. Caird describes in the above quotation is noted for producing the very finest samples of wheat, weighing 62 lbs., and even 63 lbs., to the Winchester bushel, and has for years carried off the Canada Company's prize of

$100; and it was in this district that the prize wheat exhibited at the Crystal Palace in England, was grown. There are often from 50 to 150 acres of wheat on one farm in this section. The great inducement to sow wheat, has hitherto caused many farmers to trespass too much perhaps, upon the properties of the soil required for this crop; but if Mr. Caird were this year to visit this part of the country, and view it (not from a rail-car window) he would find more extensive fields of his favorite crop, and likely to pay a higher *acreable* profit than the Illinois prairie land, because the prices in Canada are almost always double those of Central Illinois, where the corn is of a coarser description. This perseverance in the growth of wheat is an evil that time will remedy; especially as the growth of other grain and also sheep, and dairy farming, are more certainly remunerating. Another extract from page 28 gives a remarkable instance of misguided judgment and grievous misrepresentation, the first clause however, of the extract being perfectly true.

Mr. Caird says, "a light sandy loam of good quality, only half cleared, is still valued at from £7 to £8 an acre, (sterling no doubt, as all his pounds are sterling throughout the pamphlet). It is this comparatively high price of land in addition to the cost of clearing off the timber, that forces the emigrant westwards to a country where better soil with equal facilities of transport, can be bought for less than the mere cost of clearing this of its timber."

Taking the word "westwards" to mean Central Illinois, which seems to be the summit of Mr. Caird's American predilections, it may most safely be asserted that the soil there is *not better*, that the facilities of transport are *not equal*, and that even supposing land in Illinois could be bought for less than the mere cost of clearing in Canada (say £3 10s sterling per acre), Mr. Caird has omitted to state the value of the timber cleared off. He will be surprised to be told that many pine trees on these very farms are and were worth from 6s to 15s each. It is not unusual for one tree to produce five saw logs of 12 feet long each, worth 4s to 5s stg., each log. The timber alone, of well grown cedar swamps in all the settled districts of Canada West, is worth £4 to £5 per acre on the spot; and even if the hard wood is all burned to ashes, the ashes of 3 acres will, with very little outlay of capital or labor, produce a barrel of potash worth £6 sterling. The value of the timber on our wild lands in good situations, where saw-mills, or rivers to float saw-logs, are accessible, is very considerable. Our forests, instead of being a bugbear to the intelligent emigrant, are a very great source of wealth, and enable him to pay for his land and erect the required buildings, and supply fence rails and fuel, sugar, &c., which the settler on the prairie has to purchase, and sometimes at very high rates. That the soil is not better in Illinois than in Canada West, can be easily proved. Which gives the largest crops of wheat per acre of the best quality? Decidedly Canada West. The probable average of Illinois is stated by Mr. Caird at pages 55 and 89, as 20 bushels per acre, but at pages 54 he gives the *probable* yield at 18 to 20, and the *real* yield "nothing but shrivelled husk;" and again at page 52, as nearly a total failure, and 600 acres killed by frost, and at pages 75 and 76, he gives the yield of 1857, as little more than 6 bushels per acre, and according to the United States census of 1850-51, Illinois did not yield ten bushels per acre, whereas the average of all Canada West that year was 16 14-60, and of the counties to which Mr. Caird alludes to in the above extract, the average was 21 bushels. Then as to *quality of wheat*, that of Central Illinois is notoriously inferior. Merchants in Toronto import large quantities of it at about half the price of Canada wheat for distillery purposes, not being fit for making flour, except what is denominated by the Americans, "Stump-tail flour," being of a third or fourth rate quality, and this is the general character of the prairie wheat in Central Illinois. Then as to price, Mr. Caird quotes it in several places at 3s stg., (75 cents). At the very time Mr. Caird quotes this as being the price in the Illinois markets, Canada wheat was selling in Toronto and Hamilton and all our frontier markets, at exactly double that amount, 6s. stg., ($1.50) and at this date Upper Canada wheat is selling in our markets at double the price of Illinois wheat in Illinois markets.

Let old country farmers remember this, that even supposing the yield of bushels per acre to be the same, the price in Canada is double and of course the value per acre double, and giving Mr. C.'s own averages, 20 bushels per acre, and his own prices, 3s. stg. per bushel, the Canadian farmer would pocket £3 stg. per acre more than the Prairie farmer in Illinois; and this £3, be it remembered, is good interest for £50 on every acre of land sown in wheat, say one-sixth of the whole arable land, or £8 6s. 8d. per acre on all the wheat producing land on the farm.

As far, therefore, as the culture of *wheat* is concerned, the settler in Canada West has a vast advantage over the settler in the Illinois prairie, the yield, the quality and the price being all superior in Canada West. The peninsula of Upper Canada consists of soils similar to those of the Genesee valley, in the State of New York, distinguished for the finest quality of wheat, which the American miller eagerly buys to mix with the coarser wheats of the Western States. Canadian wheat makes the very finest flour, whilst Western wheat makes only second and third rate qualities. The area of the fine wheat growing lands on this continent is very limited, and Upper Canada occupies a large portion of it.

But, says Mr. Caird, "Indian Corn is the great staple in Illinois." Let us take him at his own shewing, and let us see the result. The average produce he gives in two places is 50 bushels per acre, and at another 40. The price at page 61. is 8d. per bushel; at page 71, 10d.; and at another place, page 51, one farthing per pound, or 1s. 3d. per bushel; at pages 87 and 89, 1s. 8d. per bushel. Taking the price at 1s. 3d. sterling on the spot, and the produce per acre at 50 bushels (which is far too high an average, 40 being much more like the truth) we have £3 2s. 6d. per acre the produce of a good average corn crop in Illinois. The cost of twice ploughing, planting, horse-hoeing, &c., is at least £2 2s. 6d. per acre, and the prairie farmer has £1 per acre at this shewing for himself for interest on his purchase money, fencing, buildings, &c. Mr. Caird has truly and admirably said (page 54):—"If a man buys 600 acres and has not the means of cultivating more than 60, the 540 acres are a dead loss to him. He has to pay either the price or the interest of the price of this large, unproductive extent of land. The produce of the 60 acres is called upon to bear not only its own burden, but that of the nine-tenths which are idle.—'The lean kine thus eat up the one fat one.'" Probably four-fifths of the settlers buy what is called one quarter section (being 160 acres) and are not able for two or three years to cultivate more than the fourth of it; thus, the 40 or 80 acres under cultivation or whatever it may be, has to pay the whole interest on the purchase money of the 160 acres, and of the house and buildings erected. The rent or interest of course will vary, but taking the price at £3 sterling, and the fencing at 16s. per acre, and the buildings, &c., at £100, the rent of 40 acres cropped, with house built would be about £42 10s., thus:—

First cost of Land, at £3 per acre	£480	0	0
Cost of fencing 160 acres, at 16s. per acre, being 640 rods, at 4s. stg.	128	0	0
Buildings, Well, &c., &c.	100	0	0
	£708	0	0

This £708 at 6 per cent would be about £42 10s., or 21s. 3d., sterling, per acre, leaving the farmer minus 1s. 3d. per acre on the actual cost, giving him barely laborers' wages and no interest for his working cattle, implements, &c., &c. The fencing of 160 acres, requires 640 rods of fence, which, at a very low calculation, is worth $1 per rod, or 4s. sterling. Mr. C. makes the expense of fencing £60 pounds per mile (see page 55), but considering that price too high, I have taken £40 per mile. If a whole section is purchased (a mile square) the outside fence on all the sides would be four miles, and the acreable cost of enclosing would be much less than where only a quarter section is purchased; but every prairie farmer as well as every other farmer requires sub-divisions of his farm, and 16s. sterling per acre, is a very low estimate of the cost of fencing on any farm. So that Mr. Caird's representations, at pages 89 and 90, where he says: "The third year begins by the prairie farmer finding himself the unincumbered owner of his land, all fenced and improved, with a stock of horses and implements, and the whole of his original capital in his pocket," is a monstrous delusion, calculated to do immense injury to his readers, who may be thereby tempted to settle on the agueish, treeless, shelterless and arid prairies of Illinois. The idea, too, expressed at page 90, that, "he may continue to crop his farm with Indian corn, from which he will reap very large returns on his capital," is, to say the least of it, a much too glowing and sanguine view of the prairie farmer's prospects. At page 60 he gives the opinion of a Mr. Brown, an old farmer in the country, "that more money has been made, and may be made, in this state by *stock* farming than by corn growing;" and adds, (page 61) "but he has not found short horned stock so successful on the natural prairie grass, of which, on his own lands, he has no longer any."

To give us an idea of *stock* farming, Mr. C. tells us (page 71) that "Oxen of 3 years

Cotswolds or New Oxfordshire. The Teeswater is an old and favorite breed, in some parts of England, and we think well adapted to Canada.

I shall now proceed to the subject of Sheep Husbandry as it concerns ourselves. The question has often been put to me, "is it profitable to keep sheep?" My answer to this question is in the affirmative. My opinion is, the keeping of sheep is profitable directly, and indirectly more profitable. When we take into consideration that the land of this Province, by a continued succession of cropping, becomes exhausted of its natural fertility, we ask ourselves, how is it to be prevented? what is the remedy? The answer is, keep stock to consume the produce on the premises, and return to the land that which you have taken from it. A fair proportion of this stock should be sheep. Sheep will convert an immense quantity of coarse fodder into valuable manure, if properly managed, and I think our farmers would find it more profitable to appropriate a greater portion of their farm to the feeding of sheep, than they now do, by subjecting the land to the continued operation of the plough, and the growing half crops of grain.

The last two years must surely have led farmers to see the advantage of paying more attention to stock farming. My opinion is, that under any circumstances a mixed husbandry is the safest, for it will not in any year entirely disappoint the hopes of the farmer. He cannot suffer so serious a loss as the farmer who depends altogether on his grain, should his grain be blighted or burnt up with drought. It is scarcely probable that a total destruction of live stock, wool, and grain would occur in one year. We need not be afraid of raising too many sheep, for our neighbours on the other side of the Lake are prepared to buy all we have to spare, since brother Jonathan has become so fond of English mutton. The 15th of November is a good time to put the tup with the ewes, the time of generation being about five calendar months, the lambs will come about the last two weeks of April, and the beginning of May. If the lambs come much earlier than this, the ewes require a great deal of attention and expensive feed, otherwise they will get low and out of condition.

In conclusion I may remark, that of the various animals given by a bountiful Providence for the benefit of man, there is none of greater utility than the sheep. The sheep affords us food and clothing; and in the manufacturing their wool, persons may be employed in productive labour, in the winters of Canada, when they would otherwise, perhaps, be unproductive consumers. Sheep should constitute a material part of a farmer's live stock and profits, in this Province, and I believe that nothing will pay the farmer better for kind and liberal treatment, than the sheep. When a man cultivates a farm or a field, the amount of produce is generally in ratio with the amount of labour bestowed, manure applied, and quality of seed sown; so it is with a flock of sheep, if you turn them on the roads in summer, and feed them on nothing but straw in the winter, it is unreasonable to expect that they will yield much in return.

I have not said anything about the qualities or the properties of the Merino sheep, because I know very little about them experimentally, but being natives of countries much milder than our own, such as France and Spain, I think they are not so well adapted to the long and severe winters of Canada, as the long-wooled sheep; they are not very handsome or attractive to look at, but they ought not to be despised on this account, for doubtless they are very useful on account of their wool, and I would remind my brother farmers, especially those belonging to the younger class, that we should be careful not to despise the useful for the sake of the beautiful.

If I have in reading this paper, shown anything like enthusiasm on the subject of Sheep Husbandry, I hope you will excuse it, for I assure you that I am much attached to it, and if circumstances demanded that I should occupy anything like a menial position on a farm, and I had my choice, it would be that of a shepherd.

But before I close, allow me to express a wish, that I hope the time is not far distant, when, instead of selling our wool to be carried out of our neighbourhood or out of the country, we shall sell it to be manufactured at Port Hope, and that the beautiful and powerful stream that runs through the town, which has been made tributary to the working of a great amount of machinery already, will be applied still further to yield the motive power required for a Woollen Factory.

I may state that a building is erected at Port Hope, possessing every convenience for the above purpose, as soon as a person or persons can be found who have the necessary capital and enterprise to work it.

great want of knowledge of facts with regard to the relative increase of population in Canada and Illinois, and is calculated to mislead his readers. Mr. C., says "Canada West is richer than Canada East, and it is more populous, but there is a richer Territory still farther west, where labour is yet more productive, and, though in the present state of the country the risk of health is greater, it is ten times more populous, for men push on to the land in which they can most quickly and easily earn an independence."

What will Mr. Caird himself say when he is told that Canada West has increased in population in a much greater ratio than his favorite State of Illinois.

By the United States census of 1850, it appears that the three states of Ohio, Michigan, and Illinois, contained in 1830, 1,126,851, and in 1850, 3,505,000; a little over 320 per cent. in 20 years. Canada West contained in 1830, 210,437; in 1850, 791,000, which is over 375 per cent. for the same period of 20 years, so that the increase in these choice states was 55 per cent. less than that of Canada West during the same time. Some of our Counties in Canada West, viz.: Huron, Perth, and Bruce, have increased 571 per cent. in ten years.

Comparing the last decade of Canada West with that of the United States, we find that the increase during the ten years, from 1840 to 1850, was 35.27 per cent., whilst that of Upper Canada was 104.58 per cent.

We have had no census in Canada since 1851-52, but there is every reason to believe that the ratio of increase, not including immigration, has continued very much the same, and there is a *certainty* that Mr. Caird's representation as to comparative increase of population in Illinois is entirely *erroneous*. Immigration to the United States has fallen off quite as much in proportion as that into Canada. The statement that an independence can be more quickly and easily earned in Illinois than in Canada West, is simply a delusion, and has been frequently proved by the return of settlers, who, like Mr. Caird, were attracted by the more inviting appearance of prairies to old country eyes. But as Mr. Caird has given a Dr. and Cr. for Illinois, at page 89, I will give a similar one for Canada. Let old country capitalists who can command the required sum, (say £750 stg.) diligently compare the two, and keep in mind the permanent difference in the quality and prices of produce, and the healthfulness of Canada, and the choice between the two will be no difficult matter to decide, even in the matter of dollars and cents, without alluding to our British Constitution, our British feeling, our British tone of morality, our British social atmosphere, &c., which Britons always appreciate more highly after a short residence in the United States.

Mr. Caird thus gives the probable Dr. and Cr. of 100 acres of land for two years in Central Illinois.

Dr.

Cash price of 100 acres, sterling	£200	0	0
Contract price of fencing, breaking, sowing with wheat, reaping and threshing, and building a laborer's cottage and stable and shed	250	0	0
Capital invested in the purchase of four horses, implements, and harness	110	0	0
	£560	0	0
Second year, wages of two men, horse-keep, taxes and accounts	200	0	0
	£760	0	0

Cr.

First crop of wheat, 2000 bushels at 3s. 6d., £350, second crop, Indian corn, 5000 bushels, at 1s. 8d., £416	£766	0	0	
Surplus after the second crop, besides the value of the land and stock				6 0 0

In Canada West the Dr. and Cr. are on the same basis. Taking 100 acres brought into cultivation, would stand thus:—

Capitalists can bring 100 acres into cultivation in Canada, as well as in the United States, although such a thing is seldom or never done that I am aware of.

Dr.

Cash price of 100 acres of land, at 3s. 3d	£	16	5	0
Contract price of clearing, fencing, and seeding, at £3 10s. per acre		350	0	0
Contract price of building a small house or shed		50	0	0
Capital invested in oxen, (two yoke) chains, &c		34	0	0
Capital invested in Potash Kettle		10	0	0
Capital invested in labour making potash and barrels		40	0	0
Second year, board and wages of 3 men, and £ in harvest, ox keep, &c		180	0	0
	£	680	5	0

Cr.

Pot ash 20 barrels, at £6	£120	0	0			
Pine timber, say 100 trees, at 6s	30	0	0			
(Where the timber is good for making potash there is not much pine for this reason I have set down a small sum.)						
First crop of wheat 2000 bushels at 5s	500	0	0			
Second crop, barley, rye, oats, peas, and potatoes, at £3 per acre, average	300	0	0			
				950	0	0
Surplus after the second crop, besides land &c				£269	15	0

☞This comparison which is justly and fairly given, shows that the Canadian capitalist has the advantage over the prairie capitalist of £269 15s. stg., in two years; and to show that these representations are by no means overdrawn, I give below the *official* published returns by our Government Agent, on the Ottawa, of the total produce of 800 acres of newly cleared land, for the year 1858, with the prices which he has attached, and which are not such as may be deemed exceptional.

Mr. French says:—"Upon these 800 acres there were raised:—

5726	bushels of Wheat at $1 per bushel	$5726	00
2916	" Oats at 40 cents per bushel	1166	40
149	" Barley at 50c. per bushel	74	50
168	" Indian Corn at $1 per bushel	168	00
16799	" Potatoes at 40c. per bushel	6718	80
6350	" Turnips at 10c. per bushel	635	00
87	tons of Hay at $5 per ton	435	00
260	tons of Straw at $4 per ton	1040	00
4012	lbs. of Sugar at 10c. per lb	401	20
108	barrels of Potash at $24 per barrel	2592	00
9249	bushels of Ashes at 8c. per bushel	739	92
	Making a total of	$19696	82

and showing the average value of each acre to be something over $24 60c. or £5 sterling for one year," an amount far above Mr. Caird's representation of the Illinois Prairies. For *three* of the above articles, viz., potatoes, hay, and straw, a market could not be found on a prairie farm; and three other articles, potash, ashes, and sugar, could not be produced. Mr. French has omitted to give credit for the timber used in their houses and sheds, or sold to timber merchants.

Let old country farmers carefully compare these two statements, and remember also that they are likely to have good health in Canada, good water, and plenty of it, and no necessity for Artesian wells 127 feet deep; good apples and pears and small fruit, and vegetables of every kind in abundance, good markets for every thing they grow, good timber for their houses and fences and fires, and a good Government that provides handsomely for the education of their families—even much better than in the United States—and if they will be guided by the honest opinion of a man of 25 years experience in Canada as an agriculturist, they will pause before they prefer the prairies of Central Illinois to the woods of Canada. The woods modify the heat of summer and cold of winter, whilst the Prairies of Illinois are subject to terrific winds and storms and snow in winter, and often most dreadful and devastating fires—and the ever falling leaves of our woods are ever depositing a rich compost, far superior to that of the long

thin prairie grass. There is still another very important consideration regarding these level prairie lands; that is, that many of them cannot be settled on till drained of the sour and unwholesome surface water, and, from the nature of the country, draining is a very expensive operation, and not unfrequently entirely impracticable. Deep permanent springs are often very difficult to find, and there is much suffering both by man and beast for want of really good pure water.

To corroborate what I have said, with regard to the deficiency of the yield of wheat, and other crops in the United States, I give below a quotation from a very late and very clever publication by John Jay, being "A statistical view of American Agriculture, its home resources and foreign markets, &c., in an address delivered at New York before the American Geographical and Statistical Society, on the organization of the Agricultural Section," New York, 1859. "The average number of bushels of wheat to the acre in Alabama and Georgia is five; in North Carolina, Virginia and Tennessee, seven, ranging upwards in the other States until it reaches twelve in New York, Ohio, and Indiana; thirteen in Maryland and Vermont; fourteen in Iowa and Wisconsin; fifteen in Florida, Pennsylvania and Texas; and sixteen (the highest average) in Massachusetts. Oats range from ten bushels to the acre through various intermediate gradations, to thirty-five and thirty-six bushels, which is the highest." The journal of the Highland Society of Scotland thus observes. "If the above statement, as given by Mr. Jay, be correct, the state of farming in many parts of America must be indeed in a wretched condition—the American maximum corresponds to our minimum," adding however the following, which appears to be only too true with regard to late years, but reports of this year's crop indicate that the evil is not progressing. "We believe," says the *Journal*, "that the wheat crop has recently suffered much from the increased ravages of insects, and from various diseases to which it seems to be becoming more and more subject."

Since the above was written, the prospects of the wheat crop in the United States this year appear to be more promising than usual, and in Canada there is every prospect of a very handsome return. From all quarters of Canada West, reports have been sent to this office of expected large crops of wheat, say from 30 to 40 bushels per acre, and of spring grain most abundant supplies, including that of Indian Corn, and corroborative of what I have stated, with regard to the yield of this grain in Illinois not exceeding 40 bushels per acre, I again quote Mr. Jay's statements, as given by the same journal:—"Commencing, he says, at eleven bushels per acre, the returns of produce of Indian Corn range, through various gradations in the different States, up to 32 in Vermont and Iowa; 33 in Indiana; 34 in Missouri; 36 in Ohio, and 40 in Connecticut." This last is the highest return given.

I am Sir,

Yours with respect,

WILLIAM HUTTON,

Secretary Bureau of Agriculture.

Toronto, July 22, 1859.

THE WHEAT-FLY, AND THE REMEDY.

To the Editors of the Agriculturist.

The attention of the country seems now to be fully roused to the importance which must attach to this subject, and it is certainly time that the evil threatening western Canada, through the destruction of the wheat crops, should cause farmers to devise some means by which to save their grain; or in case that can not be done, to adopt in time a system of culture that will enable them to turn their attention successfully to the raising of products heretofore much neglected.

The midge advances gradually through the country, at the rate, it is supposed, of about 10 or 12 miles each year, but its progress varies according to the nature of the ground, and through peculiarities of the season. A few lead the way, their numbers gradually increase, and the unwary and hitherto inexperienced farmer is seldom aware of the presence of his unwelcome visitor till the second or third year of his occupancy. Once established, there *he remains*, and sends forth fresh broods to cover new territory. The writer first encountered the wheat fly in a remote parish of Lower Canada in the

year 1837, the grain was then being partially destroyed, and the inhabitants looked upon their loss as temporary, supposing their enemy would soon pass away, as does the Hessian fly and others; in this however they were mistaken, for the evil rapidly increased, and is in full force there to the present day.

In the island of Montreal are to be found some of the best farmers that Canada can boast of—these gentlemen and others, more than twenty years ago, went through a series of experiments in order to find the vulnerable point, if any such existed, of their apparently insignificant enemy. They tried the effect of top dressing and manuring the soil with substances thought to be destructive to insect life; they steeped their seed in poisonous solutions; they avoided seeding down with clover; they sowed lime broadcast over the standing grain, till the heads sometimes presented the appearance of having been whitewashed, and Mr. Evans, late of the Cote St. Paul, applied in the same way a mixture of scotch snuff and wood ashes, sown when the dew was heavy, but all to no purpose. By means of various paragraphs in the newspapers, is revealed the fact that our farmers here are enacting over again the expedients above detailed, and long ago exploded as worthless. They, in the end, will probably arrive at the same conclusion that the others did, viz: that nature has so protected from outward attacks the life of the fly and its young, that nothing is likely to exterminate them but an entire cessation in the production of wheat throughout the land. The researches made, as above mentioned, however, did not cease upon finding the midge effectually resisted all attempts to destroy it, and it was found that very early or very late wheat could be grown quite uninjured by its ravages. In so far as Lower Canada was concerned, early wheat was out of the question, and the result of long and bitter experience shows, that a late sown hardy variety of spring wheat, one not liable to rust, is all that our sister Province can venture to cultivate.

In our more favoured portion of Canada, we have every reason to believe that our staple crop, the winter wheat—on the preservation of which would seem almost to hang our destiny as a country—may yet be saved, and we may be spared the tremendous loss that would fall upon us, had we to go through years of banishment to the wheat plant, such as have been the lot of our friends in the neighbouring state.

The fly makes its appearance above ground from the 1st to the 5th of July, two or three days after which time it rises to the level of the wheat ears, and deposits its egg; this, to come to maturity, must, on being hatched, find the grain in what is known as the milk state; for should the wheat be late, the young worm will soon perish from want of sustenance, or should the plant be sufficiently early for the grain to be formed, the worm can at its then age make no impression and fails to convert it into food. Most of these facts are well known where the fly has established its sway, but we are writing also for the information of those who inhabit a number of townships where it has not been seen, that they may from the first bend their energies to the right direction to counteract the mischievous operations of an enemy that seems determined, sooner or later, to have a look at every part of Canada.

The deductions we make from the foregoing are, that wheat, to escape the fly, must either be made to ripen late, and thereby incur a great risk of being rusted or grown, or some such culture must be adopted as will cause it to come into ear earlier than is usual with us. Early sowing, thorough draining, and good preparation in other ways, will sometimes effect this object, but they can not be depended on alone for the purpose of avoiding the fly,—*an early variety of winter wheat* used for seed, is, we believe, a sure means of making the crop perfectly safe from its ravages, *and from the effects of rust.*

We have for a long time past had this subject brought forcibly before us. The writer farmed till 1848 in Lower Canada, where the fly systematically devoured all but the late sown spring wheat; he has watched with anxiety its gradual progress from east to west, and has visited the state of New York at harvest time for the last four years, where he has seen, with alarm for Canada, the gradual discontinuance of attempts to raise winter wheat, and at last its final abandonment in the once famed valley of the Genesee. This year however, a circumstance came to our knowledge bearing very materially upon the subject under consideration, and seemed, if borne out by fact, to point out the antidote required. A man, it was said, had sown southern wheat in a northern latitude, and had been entirely successful in reaping a good crop therefrom. The writer proceeded to his farm in the northern part of the State of New York, where he found the crop, then being harvested, was as it had been described; he found that this was the *third* year of his having grown southern wheat, escaping each time both fly and rust, while his neigh-

bours, who from ordinary seed had tried to raise small patches of winter wheat, lost by the rust any thing not eaten by the fly. That he had sown on the 7th of September, which he considered to be too late, and that the sample was good, and such as a miller would like. The writer afterwards went through another field of wheat, raised from southern seed, it was situated at about forty miles from the first; it had entirely escaped the fly, as had also the crops of neighbours who had used the same kind of seed, of which not less than 300 bushels had been distributed in that vicinity. We have since heard from good authority of two other instances of farmers in other parts of New York having pursued a similar course with like success. As soon as we had satisfied ourselves of the advantages which the southern wheat as seed, possessed over other kinds, we lost no time in securing a few hundred bushels for this year's seeding, of a similar kind to what we had seen growing, and now have it on hand to supply those agriculturists who may agree with our estimate, of the vast importance the matter is to the farmers particularly, and to our country generally. The seed should be put in by the first of September, it is brought from Kentucky where it ripened the seventh of June, and (judging by the time the New York wheat ripened) will be fit to cut here by the 7th or 10th of July next. The wheat may be seen at our office, where every information concerning it will be cheerfully given. We are of opinion that quite a large breadth of land in New York will, this autumn, be sown with this variety, and we see no reason why Canada should wait till she lose a whole crop, before she consent to adopt a suggestion originated amongst our neighbours, whose ideas were perhaps sharpened by several years' light feeding on corn meal and buckwheat flour, as the best substitute they had for their missing "extra Genesee." We do not recommend our farmers to throw aside their old seed all at once, but we say put in a few acres of southern wheat, and give it a trial alongside of your own.

The operations of the fly in our part of the country have been very partial this year, if farmers will take a little trouble to compare dates of heading out and ripening, they will find that the earlier the fall wheat was, the less they would find of the fly about it. We know of one gentleman in Etobicoke who has a reasonable expectation of thrashing out at least fifty bushels of good wheat to the acre, while we could mention the name of another, whose farm is in Scarboro' (both adjoining townships to this), that will, out of a fine looking field, scarcely get his seed back, so severely has the fly treated it. Some are misled into thinking that because of there being so little of the midge this year, there may be none in time to come. The reason of so fortunate an escape as many are now experiencing, is the accidental circumstance of our having wheat earlier than usual, while the season on the whole has been cool and backward—this, in the natural course of events, may not occur again for years. That the fly is present with us is but too evident from the condition of late *winter*, and *early* spring wheats, and we have found *late ears* in an early field, full of the insect, while the other heads were free. Having some time before harvest personally examined the growing wheat between this and Thornhill, and over a good breadth of country east and west of Yonge street, we found abundant indications of fly in nine-tenths of the crop, but the grain there had advanced so far towards maturity before having been attacked, that but a comparatively trifling injury will be sustained, (we should estimate to an extent of not more than 20 per cent. of the whole). In Nelson and Nassagawega, we, on inspection, found the wheat to be a few days earlier, and almost free from insect, confirming what we have above advanced with regard to the important bearing the time of ripening has upon the preservation of the grain. And in conclusion we have to say, that whether our suggestion, for which we can not claim the merit of originality, be a benefit or not, farmers must prepare to see the whole of this fine wheat growing country covered, sooner or later, with what has hitherto proved the worst enemy that Canadian agriculture has ever contended with.

F. A. WHITNEY & Co.

Toronto, August 1st, 1859.

SUMMER DRINKS.—SHERBET:—Eight ounces of carbonate of soda; six ounces of tartaric acid; two pounds of loaf sugar, finely powdered; three drahms of essence of lemon. Let the powders be very dry. Mix them intimately, and keep them for use in a wide-mouthed bottle, closely corked. Put two good-sized tea-spoonfuls into a tumbler; pour in half a pint of cold water, stir briskly and drink off.

Agricultural Intelligence.

GREAT TRIAL OF AGRICULTURAL MACHINES AND IMPLEMENTS AT MONTREAL.

We are glad to find that a general trial of Machines and Agricultural Implements, under the direction of the Board of Agriculture of Lower Canada, will take place at Montreal, on the 16th, 17th and 18th of the present month of August. Mechanics from Upper Canada and the United States are invited to compete, and gold, silver and bronze medals will be awarded to the makers of the best and most efficient implements. The trials will take place in the following order:—

FIRST SERIES.—PREPARATION OF THE SOIL.

First Day.—Ploughs for light soils, for all purposes—Ploughs for stiff soils, for all purposes—Ploughs for deep soiling, sod and subsoil ploughs—Subsoil ploughs, swivel ploughs—Gang ploughs, stubble-ploughs.

Second Day.—Heavy harrows for tenacious soils—Light harrows for gravelly or light soils—Clod-crushers—Light rollers—Scarifiers—Root extractors—Double mould board ploughs.

Third Day.—Beet, Carrot and Turnip Sowers—Bean and Maize Sowers—Grass seed Sowers—Horse Hoes—Potato, Carrot and Beet Diggers—Spades, Shovels, Hand Hoes, Pitch Forks, and other implements intended for the preparation of the soil. The same Jury will be charged with Land Drainage to be executed on the spot.

SECOND SERIES.—HARVEST.

First and Second Days.—Mowers—Mowers and Reapers combined.

Third Day.—Hay Spreaders—Horse Rakes—Scythes—Sickles—Hand Rakes—Hay Forks and other implements for harvesting.

THIRD SERIES.—PREPARATION OF FIELD PRODUCTION AND CATTLE FOOD.

First and Second Days.—Threshing Machines for one horse—Do. for two Horses or more—Horse Powers.

Third Day.—Fan Mills, Separators, Corn Crushers, Straw-cutters—Root-cutters—Cooking apparatus and other implements intended for the preparation of the products of the Farm and for Cattle food.

HOPE FARMERS' CLUB.

PAPER ON SHEEP HUSBANDRY.

The Township of Hope Farmers' Club, met at the Guide Board, on Monday, for the purpose of discussing the subject of Sheep Husbandry. The attendance was very respectable. The President, Nathan Choate, Esq., occupied the chair. Mr. John Foott, President East Durham Agricultural Society, and a member of the Club, read an essay on Sheep Breeding, which will be found below. An animated discussion followed the reading of the paper.

MR. PRESIDENT AND GENTLEMEN,—I cannot help regretting that you have called on me to read an essay on Sheep Husbandry at this busy season of the year, for I have not been able to devote sufficient time and attention to the subject, to do it anything like justice. I know the subject is of great importance to us as Farmers, as well as to the country at large, and I fear that the paper which will be read to you will be but a poor attempt. However, when any task is assigned to me, you know I am not the person to flinch from it. I have endeavored to put a few hasty thoughts together, which I hope you will receive in all charity. The subject is too extensive to be condensed into a single essay. I shall, therefore, only introduce it, and confine my remarks to the *Breeding* of Sheep; and if I shall be spared to see the approaching winter, and I

should be your wish, the subject may be further gone into, taking up such points as the feeding, housing, and general management of sheep, together with some remarks on the bringing to market.

From the earliest ages of the world, the keeping of sheep has been a very interesting and profitable occupation to mankind. Abel was a keeper of sheep, and through succeeding generations the tending of sheep formed the employment of a large portion of the population of the earth. Thus, we find in the days of Abraham and Lot that their flocks and herds became so numerous that the land was not able to bear them; the Patriarchs, those especial favorites of Heaven, were all engaged in this noble and honorable employment, and it was not only the men that were engaged in it, but we find that the women also assisted in tending the flocks. We read in sacred history, that when Jacob went down to Padanaram, he met Rachel at the well, watering her father's sheep, for she kept them. David was taken from the sheep cots and anointed by the prophet to be King of Israel; and if you will read the Psalms you will find that the most sublime and expressive of them have direct reference to pastoral life.

It strikes me that those shepherds in ancient times were in great favor with God, for we find at the commencement of the Christian era, when the greatest event that ever took place in the world was about to happen, that shepherds were the first to be made acquainted with it; while keeping their flocks by night the glory of the Lord shone upon them.

As the world advances in civilization, so the keeping of sheep seems to advance in importance; it is only since the establishment of the Australian Colonies, that any great amount of wool has been imported into Europe—that country sends an immense quantity annually to the British market.

Before the finding of gold in Australia, wool was its most valuable export. The wool for the finer fabrics of cloth used to be obtained from Germany, and other countries of Europe. The Americans send considerable quantities of wool to the English markets. This branch of farming is increasing very much in the south of the American continent, the Western States, and Texas. A person writing from the latter place, gives a glowing account of his success in sheep farming. He says: "I have now about five thousand sheep, and all fine stock. Have realized over seventy-five per cent profit, per annum, on the investment since I have been here, which will do for bad times.—Flocks now in finer and healthier condition than ever. My good luck has lasted three years without intermission. If I can go on for three years more with the same success you'll hear the bells all the way to Boston."

Mr. Caird, speaking of Prairie farming in the West, says: "I drove to the farm of Mr. Connell; he is a practical man, who has all his life been engaged in farming. He left the old country in 1811; farmed in a small way in the State of New York, where he first settled, and moved thence to Illinois, seventeen years ago, took his small flock of merinos with him. They have been remarkably healthy; increased one-third every year, and his flock now numbers 25,000. His fleeces average four to five pounds each, and the wool sells for 1s 6d to 1s 8d per lb. The sheep are sent to the prairies in April; 1,200 are placed in charge of one shepherd, who tends them and supplies them with salt; they need no other food for six months. He brings them to his enclosed ground in winter, and gives them hay when they need it, and a little corn. His flocks have never suffered from any epidemic, but have been free from disease. His original flock increased one-fourth in weight and size after being brought from New York to this better soil. He prefers the Merino to the South Down for this climate and soil, and has found from trial that the Merinos yielded as much mutton, and far better wool. He imports pure Merino Rams from Germany and Spain to improve his flocks."

It will be perceived from those accounts, that Sheep Husbandry is becoming of greater importance, and keeping pace with the other improvements that are going on in the world. It is not many years since in those countries that have been last mentioned not a sheep was to be found.

Sheep are kept in some parts of the world to an extent that some people have but little idea of. When Prince Esterhazy was in England, some years ago, he paid a visit to the late Earl of Leicester, who was one of the largest farmers and stock-breeders in England. The Earl showed him a thousand ewes in one flock, and asked the Prince what he thought of that? The Prince replied, "My shepherds are more numerous than your sheep." Prince Esterhazy is said to possess a flock of 300,000 sheep, fed on his estates chiefly in Hungary. The superintendence and management of the flocks is conducted with the greatest regularity; monthly reports are sent in to a Board of Direc-

tors, who are appointed to superintend and give instructions to the different persons in charge of farms. Spanish Merino Rams have been sold in Hungary for £1,000 and upwards.

The French Government have expended large sums of money at different times in importing Sheep from Spain and other countries, to improve their flocks, hence the superiority of the French Merinos at the present time; these facts are mentioned to show that great importance is attached to the breeding and keeping of Sheep, almost in every country of the civilized world.

When Sheep are kept in such large numbers as I have spoken of, it is for the sake of the wool, not the mutton; the mutton is a secondary consideration, in fact, a matter of little importance; they are pastured on land that cost the owners but little or nothing, the greatest expense being the paying of shepherds to take charge of them.

Sheep are kept in pretty large numbers in some parts of England and Scotland; these take what we may term a middle stand, the wool and mutton both being very valuable. The Sheep are bred and pastured on land commonly known as Moor Lands, or Gorse Commons, or Heather; those lands are almost worthless but for the pasturing of Sheep; these are kept by the breeders until they are two or three years old, when they are sold to farmers and graziers who live in more favored localities, fatten on the rich pastures or turnips, and sold to the butcher, and go to feed the million. We then come to another description of Sheep, viz., the Long Wools; these are generally bred and fattened by the same individual, never changing hands until sold to the butcher. These Sheep form the minority, but I think it is by far the most interesting part of Sheep farming.

We could dispose of any quantity of that breed of Sheep. There is always a good demand for Wool at prices which may be considered remunerative: taking the average of the last few years, it will be found to be about 25 cents per lb., for coarse Wool. I have always found that the cash realized from the sale of Wool comes in quite opportunely, being at a time of the year when the Canadian farmer has very little else to dispose of. As to the class of Sheep best adapted to our country, I suppose there is a variety of opinion. Of the English breeds, we have the Leicesters, the Teeswater, Lincolns, Cheviots, and Southdowns, French and Spanish Merinos, and I suppose some others of the fine wool breeds. All these different kinds have their admirers and advocates. We have some of the old stock, the Canadian, but this class is getting small, most of the sheep throughout the country being crossed with one or other of the imported breeds.

We now come to a very important part of our subject, viz., the cross breeding of Sheep.

There are but few, comparatively speaking, of our Canadian farmers, who possess the means to import stock from England or other places where the pure breed can be obtained, and there is a less number still who have the disposition to do so, this being attended with great expense and risk of capital. But there is a great number of farmers who wish to improve their stock of Sheep by purchasing those animals which have been bred from Imported Stock. While it is beyond the means of some individuals to import, it is within the means of the majority of farmers to purchase those which have been bred from imported stock, especially male animals.

If an individual farmer thinks he cannot afford to pay 20, 30, or 40, or more dollars for a Tup Sheep, he could join one or more of his neighbors to do so, as one Tup would serve from fifty to one hundred ewes.

Much has been spoken and written about crossing Merinos with Leicesters, the Native with Merinos, Southdowns and Merinos and a variety of crosses, but I confess that I have no faith in it. A very useful class of Sheep may be obtained, by crossing a Canadian Ewe with either a Leicester, Cotswold or Teeswater Ram. The produce of this cross will be a good plump carcase, with a fleece weighing five or six pounds of clean washed wool. I wish here to correct what I consider a prevailing error; that the first crosses is the best. It's true, the change may be more apparent, but no certain degree of excellence can be obtained, unless the female is equally well bred with the male. This, however, is impossible to be obtained under present circumstances. We must endeavor by crossing and selecting, to improve our breed of Sheep, and this we may accomplish by care and attention. Our motto should be "Excelsior," still higher. At the end of every two years a Tup should be introduced into the Stock from another family of Sheep, so that there be no in and in breeding, and that should be a better one than you had for the past two years, if it can be got.

The following particular points demand attention; and as in cattle, the male has the greatest influence, it is proper to specify those requisites which are considered essential to a good Ram.

The head of a Ram, should be fine and small, his nostrils wide and expanded, his eyes prominent, and rather bold and daring; ears thin, his collar full from his breast and shoulders, but tapering all the way to where the neck and head join, which should be very fine and graceful, being perfectly free from any coarse leather hanging down; the shoulders broad and full, which must at the same time join so easily to the collar forward and chine backward, as to leave not the least hollow in either place; the mutton upon his arm, must come quite to the knee; his legs upright, with a fine bone, being equally clear from superfluous skin and course hairy wool; the breast broad and well formed, which will keep his fore legs at proper wideness; his chest full and deep, and instead of a hollow behind the shoulders, that part by some called the fore flank, should be quite full; the back and loins broad and flat and straight, from which the ribs should rise with a fine circular arch; his belly straight; the quarters long and full, with the mutton quite down to the hough, which should stand neither in nor out; his twist deep, wide and full, which with the broad breast will keep his fore legs open and upright; the whole body covered with a thin pelt and that with fine bright soft wool. The characteristic marks of the Ewes should be the same as those of the Ram. There is no breed of sheep equal to the Leicester as far as beauty and symmetrical form goes, also in coming to early maturity, but they are too delicate for our long and severe winters.

The Teeswater is far better adapted to Canada than the Leicester; but I have no objection to a dash of the Leicester with the Teeswater.

The Cotswold or New Oxfordshire Sheep is equally well adapted to Canada, and in some respects perhaps better, being of a very hardy constitution, growing to a large size, and and producing a splendid fleece of wool.

In the specimens of wool which I have shown you, you will perceive that there is considerable difference in the length and fineness of the staple, the weight of the fleece being about equal, the Teeswater growing so long and thin in some cases leaves the back of the Sheep quite bare, while the wool on the Cotswold grows in a thick compact mass, so that it is almost impossible for wet to penetrate through it; in this respect the Cotswold has the advantage over every other kind of long woolled sheep; perhaps they are not equal to the other breeds in coming to early maturity.

To be a successful breeder of Sheep, requires a great deal of patient perseverance, and attention to all its details, and a thorough acquaintance with the principles of breeding; the reason why so many individuals who have invested large sums of money in purchasing expensive animals have failed is the want of practical knowledge. One injudicious cross in a valuable flock will leave its mark for years. I will give you an illustration of this: for the last two years I have used two rams, the one a Cotswold, the other a Teeswater with a dash of Leicester; part of the ewes that had lambs by the Cotswold ram in 1858, have had lambs by the Teeswater ram in 1859; the type of the Cotswold is very plain in some of those. I do not say this was a bad cross, I mention it for illustration.

All females are very susceptible during the time of conception; perhaps the greatest instance we have of this is in the case of Jacob. I suppose you are all acquainted with this circumstance. I hope there is no one present but will acknowledge, that the hand of Divine Providence was at work in this instance. Yet it shows on the part of Jacob an intimate acquaintance with the nature and habits of breeding animals.

It was said by Mr. Burke that the man who made two blades of grass to grow where only one grew before was a benefactor to his country. We think that the man who can produce a breed of sheep that will yield a double amount of wool and mutton on a given quantity of food, where only half the quantity was produced before may also be considered a benefactor to his country.

Among the breeders of long wool sheep, the late Mr. Bakewell stands at the head of the list. He was the originator of those beautiful animals known as Leicester Sheep. There is a number of others who are entitled perhaps to almost as much credit as he is for following up his improvement. Mr. Jonas Webb, renowned as a Southdown breeder, is well known. He has done more than any other man to improve that valuable breed of Sheep.

There is another breed of Sheep which is gaining favour in England. I mean the

Cotswolds or New Oxfordshire. The Teeswater is an old and favorite breed, in some parts of England, and we think well adapted to Canada.

I shall now proceed to the subject of Sheep Husbandry as it concerns ourselves. The question has often been put to me, "is it profitable to keep sheep?" My answer to this question is in the affirmative. My opinion is, the keeping of sheep is profitable directly, and indirectly more profitable. When we take into consideration that the land of this Province, by a continued succession of cropping, becomes exhausted of its natural fertility, we ask ourselves, how is it to be prevented? what is the remedy? The answer is, keep stock to consume the produce on the premises, and return to the land that which you have taken from it. A fair proportion of this stock should be sheep. Sheep will convert an immense quantity of coarse fodder into valuable manure, if properly managed, and I think our farmers would find it more profitable to appropriate a greater portion of their farm to the feeding of sheep, than they now do, by subjecting the land to the continued operation of the plough, and the growing half crops of grain.

The last two years must surely have led farmers to see the advantage of paying more attention to stock farming. My opinion is, that under any circumstances a mixed husbandry is the safest, for it will not in any year entirely disappoint the hopes of the farmer. He cannot suffer so serious a loss as the farmer who depends altogether on his grain, should his grain be blighted or burnt up with drought. It is scarcely probable that a total destruction of live stock, wool, and grain would occur in one year. We need not be afraid of raising too many sheep, for our neighbours on the other side of the Lake are prepared to buy all we have to spare, since brother Jonathan has become so fond of English mutton. The 15th of November is a good time to put the tup with the ewes, the time of generation being about five calendar months, the lambs will come about the last two weeks of April, and the beginning of May. If the lambs come much earlier than this, the ewes require a great deal of attention and expensive feed, otherwise they will get low and out of condition.

In conclusion I may remark, that of the various animals given by a bountiful Providence for the benefit of man, there is none of greater utility than the sheep. The sheep affords us food and clothing; and in the manufacturing their wool, persons may be employed in productive labour, in the winters of Canada, when they would otherwise, perhaps, be unproductive consumers. Sheep should constitute a material part of a farmer's live stock and profits, in this Province, and I believe that nothing will pay the farmer better for kind and liberal treatment, than the sheep. When a man cultivates a farm or a field, the amount of produce is generally in ratio with the amount of labour bestowed, manure applied, and quality of seed sown; so it is with a flock of sheep, if you turn them on the roads in summer, and feed them on nothing but straw in the winter, it is unreasonable to expect that they will yield much in return.

I have not said anything about the qualities or the properties of the Merino sheep, because I know very little about them experimentally, but being natives of countries much milder than our own, such as France and Spain, I think they are not so well adapted to the long and severe winters of Canada, as the long-wooled sheep; they are not very handsome or attractive to look at, but they ought not to be despised on this account, for doubtless they are very useful on account of their wool, and I would remind my brother farmers, especially those belonging to the younger class, that we should be careful not to despise the useful for the sake of the beautiful.

If I have in reading this paper, shown anything like enthusiasm on the subject of Sheep Husbandry, I hope you will excuse it, for I assure you that I am much attached to it, and if circumstances demanded that I should occupy anything like a menial position on a farm, and I had my choice, it would be that of a shepherd.

But before I close, allow me to express a wish, that I hope the time is not far distant when, instead of selling our wool to be carried out of our neighbourhood or out of the country, we shall sell it to be manufactured at Port Hope, and that the beautiful and powerful stream that runs through the town, which has been made tributary to the working of a great amount of machinery already, will be applied still further to yield the motive power required for a Woollen Factory.

I may state that a building is erected at Port Hope, possessing every convenience for the above purpose, as soon as a person or persons can be found who have the necessary capital and enterprise to work it.

Horticultural.

DESTRUCTIVE INSECT.—We are informed that throughout the western section of this country, great havoc is being made among fruit trees by a sort of worm or caterpillar, which has appeared in immense numbers on apple trees. They are devouring the leaves, and some orchards have been stripped already so that they are as bare of foliage as in mid winter. It is said that after this species of worm has visited a tree, it is useless to expect a yield of fruit the succeeding year, and if that statement is true, the prospects are gloomy enough for fruit in the places where the worm is operating.—Last year scarcely any apples were grown; this year what the frost did not touch will of course receive a blight, and the tree will not recover from the shock in time to yield next year.—*Rochester Democrat.*

TRANSPLANTING EVERGREENS.—The *London Gardener's Chronicle* describes the following method as promising great efficacy in reviving plants dried by having had their roots too long out of ground, and in ensuring their safe removal in late spring and summer, and as being especially fitted for evergreens when transplanted.

"Make a hole in the ground to contain about 20 gallons of water, and pour about 16 gallons into it, add to this about 20 lbs. of barnyard manure mixed with about the same quantity of fine rich soil. By working the mixture for a long time, and carefully, you reduce it to the consistence of whitewash. In this mixture steep the roots of your plants, just before putting them into the ground; the earth thrown after them into the hole sticks to the roots, which immediately begin to swell. At the very first movement of sap, rootlets appear through this coating, which gives them immediate manure, and not only brings on but secures the further formation of roots. Once fairly started, there is nothing more to fear." This reminds us of the plan for encrusting seeds with manure in order to give the seedlings a good start, recommended by an ingenious gentleman at New Orleans.—*Scientific American.*

MICE IN GARDENS.—As many persons prefer setting the common mouse-trap in their gardens, when annoyed with vermin, in preference to any other kind, I observed lately an instance when this was practised, and the traps were placed within small wood boxes, for the purpose of keeping the bait of oatmeal, or whatever may be used for this purpose, dry. Being protected from rain, arsenic might be used for this purpose with safety, if the apertures in the box for the admission of vermin were only large enough to admit mice and rats.—NEMO, *in Flor. Cab.*

BONES FOR FRUIT TREES.—There is nothing like decaying bones for all sorts of fruit trees. They are perhaps best for pear trees, next for apples, and then for quinces; but are good for any kind of fruit unless it be cranberries, which seem to live and grow on little but air and water. If it is not convenient to reduce the bones into sulphuric acid, break them up small and place them about the roots of the tree.

TO KEEP MILDEW FROM GOOSEBERRIES.—A correspondent of the Ohio *Farmer* recommends putting boards or shidgles on the ground under the gooseberry bushes, to keep the water away and the ground cool, and thus prevent the fruit from mildewing. Make the application early.

TO DESTROY INSECTS ON TREES.—A solution of whale oil soap will destroy the numerous insects that infest trees and shrubbery at this season of the year. Dissolve the soap in warm water, making suds of medium strength, and sprinkle the leaves with a syringe. This specific is sure death to the caterpiller, miller, and an army of ravagers that destroy the foliage. Now is the time for its application.

RASPBERRY, STRAWBERRY, CURRANT, OR ORANGE EFFERVESCING DRAUGHTS:—Take one quart of the juice of either of the above fruits; filter it, and boil it into a syrup with one pound of powdered loaf sugar. To this add one ounce and a half of tartaric acid. When cold put it into a bottle and keep it well corked. When required for use, fill a half pint tumbler three parts full of water, and add two table-spoonfuls of the syrup. Then stir in briskly a small teaspoonful of carbonate of soda, and a very delicious drink will be formed. The color may be improved by adding a very small portion of cochineal to the syrup at the time of boiling.

Miscellaneous.

ORNITHOLOGY.

BY S. P. FOWLER.

There is probably no branch of Natural Science that has enlisted so many ardent admirers as Ornithology. The readers of the *Farmer* are no doubt aware of the enthusiasm displayed by Wilson, Audubon and Nuttall. William Bartram, one of our earliest naturalists, was a great lover of our feathered tribes. He remarks, "birds are in general, social and benevolent creatures, intelligent, ingenious, volatile, active beings." J. P. Girard, the author of the Birds of Long Island, says, "it is his opinion that those who pass through life without stopping to admire the beauty, organization, melody or habits of birds, rob themselves of a very great share of the pleasures of existence. In spring when nature has recovered from the chilling blasts of winter, and again puts forth her rich foliage, what can be more delightful than to listen to the rich melody of our songsters, robed in their nuptial plumage, perched on the branch of the rich magnolia, arranging their splendid attire with studied care, as if jealous the swelling buds would put forth blossoms that would rival them in beauty?" John Ray, the father of British Natural History, in his work entitled "The Wisdom of God manifested in the Works of Creation," published in London in 1727, remarks, when speaking of birds, "by their melodious accents they gratify our ears; by their beautiful shapes and colors they delight our eyes; being very ornamental to the world, and rendering the country where the hedges and woods are full of them, very pleasant and cheerly, which without them would be no less lonely and melancholy; not to mention the exercise, diversion and recreation which some of them give us." We are informed by Montaga, that the venerable Dr. Latham, a distingushed English ornithologist, when in his ninety-first year, was as delighted in seeing a specimen of a new bird, as a boy on finding his first bird's nest!

The eccentric English ornithologist, Charles Waterton, has given us an amusing account of the means employed by his instructors to counteract in his boyhood the growing passion for the study of birds. How poorly they succeeded in their endeavors to destroy his enthusiasm, may be learned from his autobiography, and the reading of his admirable "Third Series on Natural History," published in 1857, when in his seventy-sixth year. In his account of his life and adventures, he says, "when I was not quite eight years old I had managed to climb upon the roof of an outhouse, and had got to a starling's nest under one of the slates. Had my foot slipped, I should have been in as bad a plight as was poor Ophelia in the willow tree, when the 'envious sliver broke.' The ancient housekeeper, mentioned in the account of the barn owl, had cast her rambling eye upon me; seeing the danger I was in, she went and fetched a piece of gingerbread, with which she lured me down, and she seized me as though I had been a malefactor. At nine years old, I was sent to school in the north of England, where literature had scarcely any effect upon me, although it was duly administered in large doses, by a very scientific hand; but I made vast proficiency in the art of finding birds' nests. It was judged necessary by the master of the school to repress this inordinate relish for ornithological architecture, which, in his estimation, could be productive of no good. Accordingly, the birch rod was brought to bear upon me when occasion offered; but the warm application of it, in lieu of effacing my ruling passion, did but tend to render it more distinct and clear. Thus are bright colors in crockery ware made permanent by the action of fire; thus is dough turned into crust by submitting it to the oven's heat.

To my mind, language used by modern naturalists, expressive of their great love for birds, appears tame when compared with the enthusiasm discovered by some of the old authors. The most enthusistic language we remember to have read upon the importance, or rather pleasure, to be derived from the knowledge of birds, was recorded in a work originally written in High German, in rollicking style, by Peter Kolben, in 1731, in his preface to the "Natural History of the Cape of Good Hope;" wherein he says. "The beauty, the variety and music of the feathered nations are enchanting delights and their instincts and habits often nobly instructive and amusing. I cannot help adding a reflection or two more here with regard to the feathered world, those beautiful merry nations, which seem designed by Heaven as a kind of soothers and softeners of

the chagrin and melancholy of human life, and a sort of counterbalance for the dull, the sour and the gloomy parts of the animal creation. What eye is not struck with those lovely nations of singers! What ear is not ravished with charms of their melody! We say, after the French, that he who has no taste for music, has no soul. I must confess, I think he has a very strange one, or that it is hampered under a strange sort of organization, who is not sensible to the melody of the feathered nations; and can people have a relish for the music of those beautiful warblers, and not a curiosity to look into their history; and not a desire to know their make, their instincts and their economy; the knowledge of which is both profitable and entertaining? The variety of their abodes, habits and instincts, their various make, music and embellishments, are matters of the most delightful amusement. Nor are the preying, the mute or the unmusical part of them unprovided with matter of very noble and very useful contemplation." What writer in modern times, has so earnestly and enthusiastically set forth the claims of birds upon our attention, as did this old author, more than a century and a quarter ago?—*New England Farmer.*

THE IRISH POTATO.

How sweet to the taste is the Irish potato,
As memory awakens the thought of the plant!
Its dark verdant vine-top and beautiful blossom,
In pleasing transition my memory haunt.
Aye! thought of the root in profusion once growing
On the broad sunny hill slope adjoining the mill;
At the homestead, how many we raised there is no knowing,
For some were but *small ones*, and *few in the hill.*
The mealy potato, the Irish potato,
The thin-skinned potato that grew on the hill.

That delectable plant I would praise while I'm able;
For often, at noon, when returned from the field,
I found it superior to all on the table,
The best-flavored edible nature could yield.
With what eager appetite, sharpened by labour,
I plied knife and fork with a hearty good will!
Alas! there are none of the old-fashioned flavour—
None like the "real Simons" that grew on the hill.
The mealy potato, the Irish potato,
The thin-skinned potato that grew on the hill.

How prime from the full-heapen dish to receive it,
As, poised on my fork, it ascends to my mouth!
No appeal to the palate could tempt me to leave it,
Though affected by "rot" or a long summer's drouth.
And now, far removed from that loved situation,
Where I used to partake of the root to my fill,
Fancy fain would revert to my father's plantation,
And sigh for the "kidneys" that grew on the hill.
The mealy potato, the Irish potato,
The thin-skinned potato that grew on the hill.

CANADIAN MANUFACTURES.—The *Leader* announces that the Grand Trunk Railway Company have entered into a contract with a new firm, to be established in Toronto, for the re-manufacture, for a term of years, of all their old rails. There is, we believe, only one establishment of the kind in America, and that which is to carry on its operations there will probably expend in wages a larger amount than any existing manufactory in the Province. The capital necessary to start this new establishment, will not be less than $4,000,000; and it is calculated that it will give regular employment to 400 or 500 hands, and pay from $800 to 1,000 a day in wages. It will be the first large manufactory ever established in Toronto, at the same time that it will be one of the largest, if not the largest, in the Province.

AGRICULTURE AND HORTICULTURE—THE TRUE FRIENDS.

BY MRS. LYDIA H. SIGOURNEY.

"They leave no sting in the heart of memory—no stain on the wing of time."—*Hon. Marshal P. Wilder.*

Brown Ceres, one day, with Pomona was meeting
'Neath autumn's spiriting smile;
So, giving each other a sisterly greeting,
They sate down to gossip awhile.

"I hope you're quite well, dear, this elegant weather;"
"How charming the country!" they said;
"And how do you prosper," both speaking together,
"With regard to your business and trade?"

"Look, where the rude thorn bush and bramble were springing,
With fruitage the apple tree bends;
The scythe of the mower at sunrise is swinging,
And the song of the reaper ascends.

"Let us walk hand in hand, for no obstacle caring,
Till vines o'er the mountains shall grow;
Its suit of green velvet the brown heath be wearing,
And deserts with plenty o'erflow.

"The gold in its mine, with excitement and wonder,
May summon an emigrant band,
And the chariot of Mars trample on, in its thunder,
But we're the true strength of the land.

"For us no lorn wife in her cottage is grieving;
Earth welcomes us both in her prime;
No sting in the bosom of memory we're leaving,
To stain on the pinion of time."

MILK WHICH DOES NOT YIELD BUTTER, AND THE MEANS TO REMEDY IT.—The author calls the attention of those who are chiefly interested in such cases, in which there is no disease of the mammary gland nor loss of milk, but a want of oleaginous matters in the fluid. In the causes of this deficiency of butter making quality, he concludes that there are *two* principal ones, viz.: idiosyncrasy and alimentation; but there is another which cannot be so easily defined, and which occurs in animals that are well kept, and whose milk has been previously rich in butter. It is to these that the remedy is principally directed. The remedy consists in giving the animal two ounces of the sulphuret of antimony, with three ounces of coriander seeds, powdered and well mixed. This is to be given as a soft bolus, and followed by a draught composed of half a pint of vinegar, a pint of water, and a handful of common salt, for three successive mornings, on an empty stomach.

The remedy, according to the author, rarely fails, and the milk produced some days after its exhibition is found to be richer in cream. The first churning yields a larger quantity of butter, but the second and the third are still more satisfactory in their results.

A letter from a farmer states that he had fourteen cows in full milk, from which he obtained very little butter, and that of a bad quality. Guided by the statements of M. Deneubourg, which had appeared in the *Annales Veterinaries*, he had separately tested the milk of his cows, and found that the bad quality of it was owing to one cow only, and that the milk of the others yielded good and abundant butter. It was, therefore, clearly established that the loss he had so long sustained was to be attributed to this cow only. He at once administered the remedy recommended by M. Deneubourg which effected a cure.—*Veternarian.*

IMPORTANT TO MILKMEN.

We can see no reason why milkmen everywhere will persist in the habit of shipping such large quantities of water to our large cities, when water is so abundant and at such cheap rates. Why not evaporate the water, and send the milk to the cities in nice cakes, which can be dissolved to suit the users' taste and fancy.

Solidified milk is now manufactured purely and successfully in Duchess Country, N. Y.; and for the benefit of the milkmen who are so largely engaged in the transportation of water, we will give here a description of the process of solidification.

The works consist of a large brick building, situated in a beautiful valley, seven miles from the nearest railroad station, in the centre of a milk-producing district. The basement is occupied by a large boiler and steam-engine; on the first floor are the evaporating pans; in the second story are the ventilators, drying, packing, and store-rooms. The milk is collected from the farm-houses around twice a day, as soon as practicable after milking, and kept in a cool cellar under the factory. At first the milk is warmed by steam, in a large tin cylinder, up to 170° F., and a quantity of white sugar dissolved in it. Second, the milk is placed in large shallow pans, two inches deep; these pans are all kept at the temperature of 170° by means of a water bath under them. The pans are covered with a wooden structure, through which a current of air is drawn by the ventilators above. The vapour is thus carried away as soon as formed, and does not oppose evaporation. To prevent any portion of the milk from becoming solid too soon, and adhering to the pan, the whole mass is constantly stirred by steam power. After about five hours, the milk has become a sticky paste; the mechanical stirrer is removed, and its place supplied by a girl with a knife in one hand and a roller in the other, who prevents any portion of the paste from adhering to the pan, crushing the lumps to powder. After half an hour of this work, the mass has become a dry mellow, white powder. All that remains to be done, is to keep it for a few hours in the drying room, and to pack it in tin boxes with a lid cover.

The composition of cow's milk is, for 100 parts of milk: water 87; butter, 3; cheese, 4½; sugar of milk, 5; salts, ½. The quantity of sugar added to the milk is 10 parts for 100 of milk, consequently one pound of solidified milk will make five of cow's milk already sugared; and make ten or more of such milk as is sold in the streets of this metropolis. But it is not necessary to dilute it in so much water, and those who can afford the luxury put the dry powder in their coffee.

Solidified milk keeps for months, simply by taking care not to leave it in unusually damp places. It has been carried to the Pole by Dr. Kane, and to the Equator on many vessels. It is used in the sick room in its solid form, when much nutriment is wanted in a small bulk, and it is congenial to the stomach.—*Scientific American.*

Editorial Notices, &c.

STATE OF THE CROPS, &c.—For the last few weeks the accounts of the state of the crops, from one end of the Province to the other, have been upon the whole, of a very encouraging character. In some localities, where the wheat was forward, the severe frosts the beginning of June, did considerable damage, but it was fortunately restricted to small areas; and the midge, except in some few places, does not appear to have done any very serious or extensive mischief. As the grain is generally very plump and heavy, we may fairly calculate on harvesting a full average crop of wheat, of a superior quality. The spring grains are generally good, and no crop in Upper Canada at least, can be said to be short, except hay, which in many places is very light. From the United States and Europe the accounts are also highly favorable. In England, we learn from private letter (date 20th July) that severe thunder-storms had badly laid the crops in many of the southern counties, and that the potato disease, was unmistakeably showing itself. In Canada, the very early potatoes were much damaged by the frosts early in June, but the later sorts escaped, and have a very growing and healthy appearance. As the weather continues favorable for harvest operations, and the maturity of the later crops, there is every reason to hope that our farmers will experience a profitable year, and that business in general, will, as a consequence, speedily revive.

We have just returned (August 1st,) from a short tour west, and our observations fully sustain the preceding statements. We had the pleasure of spending a day with an

old friend and patron of agriculture and improved cattle, Hon. Adam Fergusson, of Woodhill, whose interest in these pursuits, notwithstanding advancing years, continues unabated. Mr. Fergusson has still a small herd of Shorthorns, in whose selection and breeding he has shown great care and judgment. The drought had made his pastures quite bare; but with plenty of shade and good water, his stock is in a thriving condition; thus evincing, under unfavorable circumstances, the strong tendency of well-bred Shorthorns to keep in flesh. Mr. F. has several bull-calves and yearling heifers to dispose of, and we are happy to be informed that he intends to exhibit them, with his admirable two-year old bull, *Athelbert*, at the approaching Provincial Show at Kingston. His resemblance to his sire, *Duke of Cambridge*, is very striking. The well-known *Duchess* blood largely pervades this herd, and it must be a satisfaction to purchasers to be assured that the animals have been kept in the ordinary way, and not stimulated by artificial pampering.

Provincial Exhibition at Kingston.—We learn that the Local Committee are satisfactorily progressing with the arrangements, and that the prospect of a successful show grows every day more encouraging. The premiums are numerous, and in many cases munificent; and the Committee are erecting a number of stalls, covered pens, &c., for horses and cattle, of *a permanent character*, such as no previous exhibition has possessed. The owners, therefore, of valuable stock may now reckon, be the weather what it may, of having them, at a very trifling cost, perfectly protected from wet and cold. Premium-lists and blank forms of entry, have been sent to Agricultural Societies, Mechanics' Institutes, &c., in the Province; and may always be obtained from the Secretary of the Association, Toronto; or the Secretaries of the Local Committee, Kingston.

Approaching Fair in Toronto.—It will be seen by advertisement on the cover of our present number, that the Corporation of Toronto have determined on holding Periodical Fairs for the sale of Live Stock, grain, and agricultural produce generally, on the Exhibition Grounds in the western part of the city; the first will take place during the present month. This we regard as an important step in the right direction. Fairs and markets in the old country have, for centuries, been regarded as essential to the efficient carrying on of country business, and their introduction to this country, wherever fairly tried and persevered in, has been attended with satisfactory results. At this fair farmers will have an opportunity of exchanging or purchasing seed wheat, grown on different soils, and at considerable distances; an object of no small importance. To butchers, cattle dealers, and country traders generally, this occasion will afford great facilities for transacting business; the site and buildings are most eligible and convenient, and we trust that the enterprise will meet with a hearty and liberal support.

Important Sale of Stock.—We have much pleasure in directing attention to the advertisement of Mr. F. W. Stone's third annual sale of imported and pure bred stock. Mr. Stone has acquired the well earned reputation of being one of the most enterprising and successful importers and breeders on the continent. He has just made a sale (on 25th July) of twenty-five sheep to go to California, viz: eleven Cotswold rams, six Cotswold ewes, five Southdown rams and three Southdown ewes. This is the second lot of sheep sold by Mr. Stone this year to go to California.

Home Manufactures.—We were shown the other day a very fine sample of factory cotton wove at the manufactory of Messrs. Nutty & Woodward, Thorold. In comparison with English and American goods of the same class, by the side of which it was placed, it bore very creditable contrast, it was remarkably fine and even in its texture, clear of specks, and altogether a first class article. It is sold at about 15 per cent less than imported goods. Our merchants should note this; for we are persuaded that an inspection of such "home products" is only necessary to secure for the enterprising factors a steady demand, at the same time building up native works and giving employment to artisans and capital that would otherwise be consumed abroad.—*St. Catharines' Constitutional.*

Rhubarb Tarts.—Peel and slice the rhubarb, sweeten to taste, and fix as a gooseberry tart. They are very delicious.